

# **THE EXTINCTION OF THE MAMMOTH**

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## **Table of Contents**

THE EXTINCTION OF THE MAMMOTH	1
THE PROBLEM OF THE EXTINCTION	4
THE AGE OF MAN IN AMERICA	18
THE HUNTING OR BLITZKRIEG THEORY	45
THE CLIMATE HYPOTHESIS	72
ARCTIC TUNDRA - MAMMOTH STEPPE OR VELIKOVSKIAN POLESHIFT?	95
THE ENVIRONMENT AND PRESERVATION OF THE MAMMOTH	161
RADIOCARBON DATING THE EXTINCTION	203
POLESHIFT	274
ICE AGE THEORY - UNIFORMITARIAN OR CATASTROPHIST?	364
POLESHIFTS, CATASTROPHES, AND MYTHS	397

## THE PROBLEM OF THE EXTINCTION

"It is easy to represent the effect of such a shock upon the Earth: the axis and motions of rotation changed, the waters abandoning their previous position, to precipitate themselves towards the new equator; the greater part of men and animals drowned in a universal deluge, or destroyed by the violence of the shock given to the terrestrial globe; whole species destroyed; all the monuments of industry reversed; such are the disasters which a shock of a comet will produce."

Pierre Simon Laplace  
*System of the World*, (1793)

"The British glacial geologist J. K. Charlesworth, has written: 'Perhaps no geological period has so divergent views as has the Pleistocene. Indeed, Quaternary geologists have long enjoyed the unenviable reputation of being among the most disputatious!'"

Gwen Schultz  
*Ice Age Lost*,  
(New York, 1974), p. 25

While Immanuel Velikovsky proposed that, in historical times, the Earth experienced a pole shift similar to that described by Laplace, Isaac Asimov, the late science fiction writer and explicator of science, goes out of his way to deny this concept and attack Velikovsky.

"To shift the position of the axis appreciably is more than the gravitational effect of other bodies in the solar system can do [at their distant locations]. We might imagine some cataclysmic effect, the passing of some planetary body near the Earth that might produce such results (effects such as those imagined by Immanuel Velikovsky in his popular but scientifically worthless book *Worlds in Collision*). There is no evidence, however, that such a

thing has happened, and if it did the result would be cataclysmic as to leave drastic evidence in the fossil record."<sup>1</sup>

Much of this evidence Velikovsky has produced to show that there was a pole shift cataclysm is presented in his book *Earth in Upheaval*, which nearly all of Velikovsky's critics, with Asimov, studiously ignore or brush aside. But even in *Worlds in Collision*, Velikovsky discussed the extinction of the mammoths and the change in climate that accompanied this catastrophe.

"The sudden extermination of mammoths was caused by a catastrophe and probably resulted from asphyxiation or electrocution. The immediately subsequent movement of the Siberian continent into the polar region is probably responsible for the preservation of the corpses.

"It appears that the mammoths, along with other animals, were killed by a tempest of gases accompanied by a spontaneous lack of oxygen caused by fires raging high in the atmosphere. A few instances later their dying or dead bodies were moving into the polar circle. In a few hours northeastern America moved from the frigid zone of the polar circle into a moderate zone; northeastern Siberia moved in the opposite direction from a moderate zone to the polar circle. The present cold climate of northern Siberia started when the glacial age in Europe and America came to a sudden end."<sup>2</sup>

In *Worlds in Collision*, Immanuel Velikovsky further claimed that, "the geographical position of the terrestrial axis and its astronomical direction changed repeatedly, and at a recent date the polar star was in the constellation of the Great Bear."<sup>3</sup> The effects of these pole shifts were more deeply discussed by Velikovsky in *Earth in*

*Upheaval*.

"What could have caused a sudden change in the temperature of the [Arctic] region? Today the country does not provide food for large quadrupeds, the soil is barren and produces only moss and fungi a few months in the year; at that time the animals fed on plants. And not only mammoths pastured in northern Siberia and on the islands of the Arctic Ocean. On Kotelnoi 'neither trees, nor shrubs, nor bushes, exist . . . and yet the bones of elephants,

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<sup>1</sup>Isaac Asimov, *The Ends of the Earth*, (New York, 1975), p. 328.

<sup>2</sup>Immanuel Velikovsky, *Worlds in Collision*, (New York, 1950) pp. 326-327.

<sup>3</sup>Velikovsky, *op. cit.*, p. 379.

rhinoceroses, buffaloes, and horses are found in this icy wilderness in numbers which defy all calculations'.<sup>4</sup>

Velikovsky thus posits that in historical times, about 3500 years ago during a great cosmic, global catastrophe, the position of the Earth's axis changed its position and, with that change, the mammoths, mastodons, and certain other animals perished from the Earth. What is the evidence and does it support a pole shift hypothesis or sudden plate tectonic movement?

One of the great enigmas of modern science is that of the extinction of the megafauna, or giant-sized animals, along with some smaller genera and several species of birds that are placed conventionally at the close of the Pleistocene/Ice Age 11,000 years ago. As Alfred Russel Wallace, the co-inventor with Darwin of the more acceptable form of evolution understood in the last century:

"We live in a zoologically impoverished world, from which the largest and fiercest, and strangest forms have recently disappeared; and it is, no doubt, a much better world for us now that they are gone. Yet it is surely a marvelous fact, and one that has hardly been sufficiently dwelt upon, this sudden dying out of so many large mammalia, not in one place only but over . . . the land surface of the globe."<sup>5</sup>

It is accepted by the scientific establishment that about 10,000 years ago the temperature of the Earth grew sufficiently warm to melt away the ice caps covering most of North America and a great part of Europe. The Antarctic ice cap was then much larger, as well. What continental ice caps exist presently are believed to be the last remnants of those former glaciers, which gradually melted back to their present boundaries. The long age of cold that had gripped the Earth so tenaciously supposedly ended and, with that *denouement*, came the extinction of the mammoths. However, the cause for this extinction of the large animals is, after some 200 years of research and debate, still unknown and, to make the mystery even more problematic, extinctions occurred on every continent of the Earth where the megafauna thrived. The only areas to only *partially* escape these extirpations were Africa and part of Southern Asia.

In North America alone, 34 types of large, and up to that time, strong and mostly successful, genera were destroyed while evidence suggests that during the previous Ice Ages only a third to a half of that number of genera became extinct. The most unusual aspect of the final extinction is that, by and large, it was mostly the largest animals that were killed off. What is also unusual, in terms of modern evolutionary theory, is that no new organisms slowly or suddenly evolved, as modern biologists posit from their theories

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<sup>4</sup>Velikovsky, *Earth in Upheaval*, (New York, 1955), pp. 6-7.

<sup>5</sup>Tim Flannery, *The Future Eaters*, (New York, 1995), p. 181.

of evolution, to supplant and replace those that became extinct in the new, warmer habitats that were made empty by their passing.<sup>6</sup>

The mammoths and mastodons had ranged across North America, South America, Europe, and Asia.

Douglas H. Chadwick, on the vitality and capacity of the ancient mammoths to endure states,

"Still, when taken as a group the proboscideans [elephants] were the most durable group of warm-blooded giants in history, consistently larger than any other order of terrestrial mammals through a long period of time. This may be because they represented the best combination of giant build and great intelligence. Whatever the reason, they dominated faunal communities through a major portion of Earth's history since the passing of the dinosaurs."<sup>7</sup>

Peter D. Ward discusses this aspect of survival with respect to the modern African elephant thus:

"Because of their size, intelligence, and ability to tolerate a wide variety of environmental changes, elephants are remarkably resistant to extinction. African elephants can be found from the edge of deserts to the deepest rainforest; they live in savannas of the plains as well as the highlands. They span the great continent of Africa. A range this extensive means it would take extraordinary circumstances to kill off a species of elephant."<sup>8</sup>

In essence, they had been able to adapt to a whole range of climatic and geological conditions. Therefore, they were not dying out and were not unfit. To the contrary, they were superbly adapted to live not only through such conditions as these, but through many prior Ice Ages. Why, then, did they become extinct? According to D. K. Grayson,

"We have accumulated facts on the nature of ancient floras and faunas, on past climates, on human prehistory, and on the chronology of it all. These are precisely the kinds of facts that scientists have assumed all along are needed to provide an adequate explanation of late Pleistocene extinctions. Nonetheless, from an historical perspective one of the most interesting lessons to be learned

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<sup>6</sup>R. Lewin, "Domino Effect Involved in Ice Age Extinctions," *Science*, Vol. 238, (1987), p. 1509.

<sup>7</sup>Douglas H. Chadwick, *The Fate of the Elephant*, (San Francisco, 1992), p. 27.

<sup>8</sup>Peter D. Ward, *The Call of Distant Mammoths*, (New York, 1997), p. 133.

. . . is that we are apparently no closer to that adequate explanation, or at least to agreement as to what that adequate explanation is."<sup>9</sup>

The problem has been attacked from every conceivable discipline: paleontology, climatology, biology, paleoecology, agronomy, geology, palynology (the study of pollens), anthropology, taphonomy (the study of bones once deposited in soil) and probably several other disciplines by scientists, for over 200 years and the solution remains as elusive as ever. Rather than the evidence leading to a secure scientific explanation or toward a broad general consensus, it has led to divisiveness bordering on rancor, where accusations are hurled at groups advocating particular theories for the extinction. Gary Haynes' comment on the nature of the evidence and how it is employed by the scientists to support their extinction theories is especially telling.

"I came to realize that most of the alleged facts about extinct proboscideans [ancient types of elephants] are fabrications whose foundations are exceptionally shaky. I have had to slog—increasingly irritated—through hundreds of published descriptions, interpretations, and explanations, where the conclusions based on nothing more substantial than mere plausibility or hearsay. The end point of my wandering education has been to find that the partial information available from past events can be readily manipulated to develop fictions of almost any sort, often quite elaborate and thus giving the appearance of a conclusiveness founded in reality. Such 'realities' are constructed and framed by mentally transforming ambiguous information into unequivocal meaning. People who do this share certain conventional beliefs about the meaning of the fossil record, and because of their similar points of view they usually reach widespread agreement about the stories told to accommodate fossil data. But the conventional beliefs may be faulty. . . .

"The business of interpreting the past has been far too much mythologized, in the name of science, to such an extent that popular novelists can do it with the same believability and authority as Ph.D. archeologists."<sup>10</sup>

Such an admission and condemnation from a researcher working in the field is, at the very least, refreshing to those who, like myself, deeply question the uniformitarian approach to this problem and reject their gradualist interpretations of the mammoth extinction outright. When a study carried on for two centuries is apparently leading nowhere, perhaps it is time to rethink the question from an entirely different construction of the causes. And I emphasize that the debate over this extinction is as volatile as ever,

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<sup>9</sup>D. K. Grayson, "Explaining Pleistocene Extinctions," *Quaternary Extinctions*, P. S. Martin, R. S. Klein eds., (Tucson, Ariz., 1984), p. 807.

<sup>10</sup>Gary Haynes, *Mammoths, Mastodons & Elephants Biology, Behavior, and the Fossil Record*, (Cambridge, Eng., 1993) pp. 318-319.

perhaps more so than in the past. Bruce Bower of *Science News* corroborates this condition.

"What caused the virtually simultaneous demise of mammoths, mastodons and saber-toothed cats, not to mention native horses, ground sloths, native camels, armadillo-like glyptodonts, giant peccaries, mountain deer, giant beavers, four pronged antelopes, dire wolves, native lions and giant short-faced bears? Scientists have grappled with this question for nearly two centuries, and, as evidenced by a recent symposium at the Smithsonian Institution in Washington, D.C., the debate is not about to cool down."<sup>11</sup>

Hence, it seems rather clear that a totally new interpretation of the evidence for the extinction problem is well in order. Sir Fred Hoyle has rather succinctly laid the philosophical grounding for rejection of scientific constructions that have not led to the resolution of long outstanding problems.

"Science is unique to human activities in that it possesses vast areas of certain knowledge. The collective opinion of scientists in these areas about any problem covered by them will almost always be correct. It is unlikely that much in these areas will be changed in the future, even in a thousand years. And because technology rests almost exclusively on these areas the products of technology work as they are intended to.

"But for areas of uncertain knowledge the story is very different. Indeed, the story is pretty well the exact opposite, with the collective opinion of scientists almost always incorrect. There is an easy proof of this statement. Because of the large number of scientists nowadays and because of the large financial support which they enjoy, certain problems would mostly have been cleared up already if it were otherwise. So you can be pretty certain that wherever problems resist solution for an appreciable time by an appreciable number of scientists the ideas used for attacking them must be wrong. It is therefore a mistake to have anything to do with popular ideas for solving uncertain issues, and the more respectable the ideas may be the more certain it is that they are wrong."<sup>12</sup>

And to some extent, this is also the conclusion another researcher in this area has construed from his own experience: "Looking at the [mammoth] extinction problem through the eyes of a young paleontologist in the early 1960's, I encountered my first

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<sup>11</sup>Bruce Bower, "Extinctions on Ice," *Science News*, Vol. 132, (1987), p. 284.

<sup>12</sup>Sir Fred Hoyle, *The Origin of the Universe and the Origin of Religion*, (Wakefield, R.I., 1993), pp. 17-18.

important lesson—that the present can be used to understand the past only with sensitive discretion. In fact, much of the past may have no modern analogue."<sup>13</sup>

One of the fictions regarding this matter has to do with freezing and preserving mammoth carcasses. Some researchers had originally suggested the mammoths were frozen in ice cold water. However, Ivan T. Sanderson points out:

"It is now well-known that the Arctic regions are positively littered with the corpses of all manner of animals both great and small. The most outstanding are those of great woolly elephants known as mammoths. Most of these permanently-refrigerated corpses are thousands of years old . . . and yet their flesh is in some cases . . . preserved. . . . They have been preserved for all this time in frozen earth, not, as people believe, in ice. The reason for this is that they died and were originally preserved in air, not water. Had they remained in water for even a short time, their own contained moisture would have permitted bacterial action to start, which in turn would have produced enough heat to permit the growth of more bacteria—and so on, until the whole or a substantial part of the corpse had been demolished. In the Arctic, sometimes only the skins or outer layers of bodies are found, indicating that just this did occur. But to preserve a complete corpse, the body must die biologically, and then remain in dry germ-free air until it is chilled right through."<sup>14</sup>

Professor of Paleontology, Björn Kurten, of the University of Helsinki, in his book, *How to Deep-Freeze a Mammoth*, presents the following argument for freezing a mammoth in air:

"A . . . preposterous myth may be traced back to a sensational article by Ivan T. Sanderson in the *Saturday Evening Post* of January 18, 1960. Sanderson began by stating that the mammoth carcasses must have been frozen at an extremely low [air] temperature, . . . (He even tells us how low the ambient temperature would have to be for a carcass this size to be frozen through and through before its innermost parts had a chance to begin to putrefy.)"<sup>15</sup>

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<sup>13</sup>R. D. Guthrie, "Mosaics, Allelochemicals and Nutrients," *Quaternary Extinctions*, P. S. Martin, R. S. Klein eds., (Tucson, Ariz., 1984), p. 292.

<sup>14</sup>Ivan T. Sanderson, *Investigating the Unexplained*, (Englewood Cliffs, N.J., 1972), p. 93.

<sup>15</sup>Björn Kurten, *How to Deep-Freeze a Mammoth*, transl. Eric J. Friis, (New York, 1986), p. 52.

What Sanderson did was cite the evidence that the unburst cells of the mammoth carcasses could not survive intact by slow freezing. They can only be created by fairly sudden freezing.<sup>16</sup> But let us examine Kurten's burial scenario.

"In brief: One takes a mammoth . . . and places it on or beneath a steep south-facing hillside. This should be done in the winter time in an area of the High Arctic where the ground is always frozen, not only at the surface (where it thaws in summer) but well down into the earth (which is called permafrost). For a first rate result, keep watch until the animal (which is assumed to be dead) has frozen through and through. If not, it may happen that wolves or lions . . . run away with the best pieces.

"After this, things should work out. In spring the uppermost layer of earth will begin to thaw. The mammoth is by then a freeze-dried mummy, and if it remains in the shade it may not thaw appreciably. Soon the top layer of earth will contain a great deal of water which has nowhere to go, as the ground underneath is frozen. Then the entire mass of wet soil and dirt starts to slide downhill, a phenomenon called solifluction, or soil-creep. The avalanche continues until it hits the bottom of the valley, where a great accumulation of soil piles up and, at best, envelopes the entire mammoth.

"Following a short summer, the temperature will once more drop below freezing, and the mammoth will now be lying in frozen ground. The next spring will bring another thaw, but if we are in luck, the mammoth is now buried so far down in the solifluction earth that it does no longer thaw out. And there you are: deep-frozen mammoth, produced by Nature's own refrigerator."<sup>17</sup>

Four years after this book appeared in English, R. Dale Guthrie, Professor of Zoology at the University of Alaska, fully debunked this process as follows:

"Like all ground cover in interior Alaska, [or interior Siberia] . . . solifluction lobes are thoroughly vegetated. Bones lying in such a vegetation mat are rapidly incorporated by plant overgrowth (usually by moss), then leached and destroyed by root acids. The rate of movement of the solifluction lobes is not fast enough to incorporate many bones [let alone an entire elephant]. Additionally, only a small margin of the solifluction lobe would work to cover bones in any one year. It is difficult to imagine a large mammoth bone or skull being incorporated intact. Solifluction movement would take several decades to cross the specimen, leaving one end decomposed. . . . One has to invoke a different RAPID DEPOSITIONAL ENVIRONMENT FOR LARGE MAMMAL

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<sup>16</sup>Ivan T. Sanderson, "Riddle of the Frozen Mammoth," *The Saturday Evening Post*, (January 16, 1960); p. 82.

<sup>17</sup>Kurten, *op. cit.*, p. 54.

MUMMIES, and yet there seems to be a continuum between mummies and the smallest bones." (Capitalization added)<sup>18</sup>

The vegetative mat in the upper layer of the permafrost contains "mild acids secreted by roots. . . ." <sup>19</sup> When the ground thaws to form solifluction lobes, these acids would eat at the carcass or shallow buried bones of the mammoth and dissolve them. Guthrie fully admits that gradualism will not work. "Mummification is not just a matter of freezing; carcasses must be buried by some rapid process." <sup>20</sup> Therefore, all the mammoths and the untold millions upon millions of bones and tusks these animals left in the arctic demand rapid or catastrophic burial. The gradualist scenario Kurten presented as plausible science turns out to be implausible fiction.

One point that Guthrie did suggest is that large, sudden silt slides can bury animals in the arctic, and this has been observed to have happened to caribou. However, if this process was common, it would also have buried and mummified many more of the smaller animals living in the same environment. There are always, in general, many more smaller creatures in a biome than larger ones. Thus for every frozen mammoth there will be many other smaller animals found, but such is not in any way the case. As Basset Digby states, there is "No explanation as to why the intense cold [and solifluction lobes or silt slides] did not freeze up cave lions, wolves, reindeer, cave bear, caribou, bison, badger, hyena, ibex, chamois, glutton and so forth." <sup>21</sup>

On the basis of uniformitarianism, no matter what the mechanism operating at the time, whether solifluction flows or silt flows, all these other animals should have found their way into the ground in great numbers. But this phenomenon is fully congruent with Velikovsky's catastrophic scenario. Based on his theory, the smaller land animals would generally have been blown great distances from where they lived and been shattered to bits by immense hurricane-like winds. The largest animals, however, would more greatly tend to remain near where they were. Ten to twelve thousand pound bodies compared with those of less than one thousand pounds would not be carried very far by the winds before being covered by a vast hail of silt, mud, stones, etc. This fundamental datum is in full harmony with Velikovsky's hypothesis and in complete disagreement with that of the uniformitarian processes proposed.

The mammoths and their bones, in their untold millions, all required sudden deep burial and freezing. It is simply not credible to suggest that predominantly large animals were buried by sudden landslides, but not smaller ones. Larger animals could more easily extricate themselves from landslides than smaller ones. Burrowing animals are an

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<sup>18</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, (Chicago, 1990), pp. 71-74.

<sup>19</sup>*Ibid.*, p. 68.

<sup>20</sup>*Ibid.*, p. 71.

<sup>21</sup>Bassett Digby, *The Mammoth*, (London, 1926), p. 54.

exception, but most of the animals preserved were not of this burrowing type. Furthermore, this destruction and extinction could not have occurred during the Ice Age because the ground was frozen to great depth, and the remains of mammoths and trees, etc., are buried at great depth, often hundreds of feet deep. There is no uniformitarian method that will bury parts of animals or trees to these depths during the Ice Age in frozen ground or permafrost. What is required is soft, unfrozen ground to bury these relics to great depth. Both the type of organisms found in the ground—large ones—and the depth to which they may be buried, contradicts their gradual burial during the Ice Age.

As David Raup points out:

"A curious aspect of fossilization is that plant or animal is most likely to be preserved if it is removed from the environment where it lived. The natural environments of most species are biologically active and support many scavenging organisms, including decay bacteria. If a plant or animal dies in that environment, its remains are soon consumed by scavengers. But if a dead body is moved quickly to a biologically inactive setting, preservation potential is enhanced."<sup>22</sup>

Above ground, in the arctic, during the Ice Age, a dead animal will be scavenged by large carnivores or destroyed by decay bacteria. Below ground, the carcass will be destroyed by plants. Caribou live in and on the tundra in summer when silt flows could occur. They have done so for untold thousands of years. If mammoths were buried by these flows, why aren't there caribou found in the same numbers, buried in the permafrost as the theory requires? Uniformitarianism simply does not work to resolve this problem. What ensues is that the mammoths could not have inhabited the arctic during the Ice Age while it possessed a permafrost, which will not allow hard bone, ivory material, or soft tissues to survive. As Velikovsky posited, the mammoths lived in the arctic at a time when it was much warmer. This will be fully analyzed below.

Another elaborate uniformitarian tale is that the mammoths fell into deep holes in the tundra and were then buried when the walls of the cavity fell in on them.

Daniel Cohen presented this explanation in his rebuttal to the catastrophists in his book, *How the World Will End*:

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<sup>22</sup>David M. Raup, *Extinction*, (New York, 1991), p. 28.

"Russian scientists have shown how the mammoths could have been preserved by falling into deep crevasses. . . . No overnight catastrophic deep freezes need be brought in to account for the frozen mammoths.<sup>23</sup>

This scenario was examined and dismissed by Sir Fred Hoyle who cogently remarked:

"We are indebted to Dr. Clark Friend for informing us that reindeer which fall nowadays down crevasses in the Greenland ice are subsequently found to be in an unpleasantly putrefied condition. The situation is that, no matter how cold the air temperature surrounding the carcass of the reindeer, the body heat of the dead animal is sufficient to promote bacterial decomposition of the interior. Yet in spite of the greater body weight of the Siberian mammoths, and of the consequent greater heat capacity of the mammoth, putrefaction did not take place within them. This is certain proof that the mammoths were robbed of their body heat at an extremely rapid rate, much quicker than conduction in [present day temperatures of] cold air will give."<sup>24</sup>

That is given the same conditions Cohen presented, it was found that animals freezing in crevasses putrefy. What is required is extremely cold temperatures to freeze dry an animal. Jody Dillow pointed out:

"An analysis is presented by the temperature drop necessary at the time of its death to leave the mammoth in the state of preservation in which it was found. By using thermodynamic models of the mammoth, it is demonstrated that the animal must have frozen to death in mid-summer by being suddenly overcome by an outside temperature below -150F."<sup>25</sup>

Although small animals such as seals found far inland in Antarctica were frozen and preserved at higher temperatures, this does not apply to large mammoths. Larger animals require colder temperature to prevent putrefaction than smaller ones. A small mass is easier to freeze dry than a large mass. Also, Antarctica gets much colder than Greenland.

There is yet the problem of forming a crevasse in ground where the top layer of soil flows every summer downhill. Any crevasse that might have formed would fill in as

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<sup>23</sup>Daniel Cohen, *How the World Will End*, (New York, 1973), pp. 215-216.

<sup>24</sup>Elizabeth J. Butler, Fred Hoyle, "On the Effect of a Sudden Change in the Albedo of the Earth," *Astrophysics and Space Science*, Vol. 60, (1979), p. 505: see also, Sir Fred Hoyle, *Ice: The Ultimate Human Catastrophe*, (New York, 1981), p. 160.

<sup>25</sup>Jody Dillow, "The Catastrophic Deep-Freeze of the Beresovka Mammoth," *Creation Research Science Quarterly*, Vol. 14, (1977), p. 5.

it did so by solifluction flows. I. P. Tolmachev understood this would occur stating ". . . As a matter of fact, the swamps and bogs of a moderate climate with their treacherous pits in northern Siberia, owing to the permanently frozen ground, could exist only in quite exceptional cases."<sup>26</sup>

Even if there was a sharp walled crevasse in the ground in which mammoths fell, in order to cover this mass of flesh, the ground must still flow as solifluction lobes to fill the cavity. This has been discovered to occur in the permafrost of Alaska when the oil pipeline was laid in 1954 between the port of Haines in southeastern Alaska and Fairbanks some 620 miles north. According to James Dyson, "On the 100-mile stretch of the route which lay over permafrost, a specially designed ditching machine had to be used. . . . By the time the pipe was welded and strung, the ditch had been completely destroyed and converted into a quagmire by thawing."<sup>27</sup>

Now, this occurred in a region of the permafrost that was somewhat south of the Arctic Circle; therefore, no deep crevasse could ever develop where the climate was as warm as described. However, well north of the Arctic Circle, a crevasse would fill in much more slowly. But it would have to fill in slowly with solifluction lobes which means the mammoth would still be leached and destroyed. In essence, the two processes promulgated by the scientists, to bury the mammoth carcasses in the arctic, are contradicted by elementary facts. Silt slides would bury many more smaller animals than larger ones. Solifluction would destroy any animal tissue it gradually covered. These are interesting ideas but, based on this evidence, they are merely fictions.

Another elaborate story is that presented by William R. Farrand regarding the ability of mammoths to navigate in the tundra in the summer when the permafrost melts and much of tundra becomes a bog. He claims the mammoths' "broad four-toed feet . . . were advantageous *in marshy pastures*."<sup>28</sup> (Emphasis added) This concept is belied by a basic fact. The size of the foot—broad or narrow—has little to do with whether or not an animal will sink in summer arctic mires. It is the load mass per square area that determines the speed and depth with which an animal will sink into a substrate. Caribou have very narrow feet compared to mammoths and thus one would expect them to be easily mired; but this is not the case. As Guthrie explains:

"Caribou are extremely well adapted to boggy substrate, with loadings of 140-80 (g/cm<sup>2</sup>), [grams per square centimeter], compared to the heavy loading of horses (625-830), saigas (600-800), elephants (510-660), and very worst of all bison (1,000-1,300) . . .

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<sup>26</sup>I. P. Tolmachev, "The Carcasses of the Mammoths and Rhinoceroses Found in the Frozen Ground of Siberia," *Transactions of the American Philosophical Society*, Vol. XXIII, Pt. 1, (Philadelphia, 1929), p. 57.

<sup>27</sup>James Dyson, *The World of Ice*, (New York, 1972), p. 168.

<sup>28</sup>John White, *Pole Shift*, (Virginia Beach, VA, 1988), p. 26.

"These figures do not tell the whole story, however, because other adaptations can affect ease of foot withdrawal and walking on boggy ground, especially for caribou and moose. For example, moose (420-560 g/cm<sup>2</sup>) and musk-oxen (325-400) both have large dewclaw hooves and hooves with the ability to spread apart and form a broad surface. This is, of course, unavailable to horses and mammoths, which have rather fixed foot surfaces. . . .

"Woolly mammoth feet, for example, are not larger than the feet of living elephants.<sup>29</sup>

However, horses and bison lived along with the mammoth in the arctic, and all three animals, according to Guthrie, have foot loading weights that make them extremely poor candidates as inhabitants of a region that becomes covered with mires every summer.

What we have just discovered, and will discover repeatedly, is that the researchers have employed concepts that are based on unscientific methodologies, based on uniformitarian concepts that generate theses, again and again, that belong in the genre of fiction. Applying uniformitarian interpretations to data that the present is the key to the past, will be shown to be baseless regarding the extinction of the Pleistocene. What, then, are we left with to tackle this extinction dilemma and enigma? That, indeed, is the subject of this book.

It will be demonstrated repeatedly that the uniformitarian interpretations of the evidence are in disagreement with the most fundamental facts and processes, but not that of the catastrophic evidence, and further, that much of the evidence was well-known and well understood for some time. It will also be demonstrated, as with the canard of solifluction lobe burials and elephants' broad feet that the new evidence from recent research also contradicts those uniformitarian interpretations. And lastly, I will fully demonstrate that the mammoths could not have become extinct in Siberia or Alaska 9,000 to 10,000 years ago, but had to have lived in Siberia and Alaska after 8,500 to until about 3,500 years ago as Velikovsky theorized. It will be shown that the uniformitarian pictures painted by the scientists of this episode in geological and biological history are elaborate fictions based on uniformitarian interpretations and explanations of implausibilities, and even impossibilities. But, let us first examine the two major uniformitarian theories respecting the extinction of the ancient elephants to expose their inadequacies, contradictions, and fictions to show, as William White Bucks claimed of the catastrophist analysis, that they belong to the "school of fantasy [and] is so much . . . wishful thinking,"<sup>30</sup> when, in fact, just the opposite is the case. Uniformitarianism is before the court.

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<sup>29</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, pp. 262-263. See also, Ivan T. Sanderson, *he Dynasty of Abu*, (New York, 1962), pp. 84-85.

<sup>30</sup>William White Bucks, "Mammoth Update. . ." *Kronos*, Vol. VII, No. 4, (Summer 1982), p. 65.

To be specific, with respect to uniformitarianism as a theory, R. Brady's comments on another concept describe precisely how uniformitarianism is corrupting and unscientific once accepted and applied to the evidence of the past.

"Once we have become convinced by our theory, for whatever reason, artifacts of that belief are bound to emerge, for *we see the world in the context of our belief*. . . .

"If we are in the position of saying 'Since we now know the theory is correct, what follows?', the item under investigation here is not the world of experience, *but the theory*, for experience no longer has the power to question that belief. The addition of empirical evidence at this point changes nothing, because whatever *evidence we include will be interpreted by our theory*, producing such artifacts as the *illusory 'confirmation'* and correction above. There should be no confusion about this. A firm conviction precludes any possibility of learning from experience. . . . By treating the theory as a known parameter we *approximate tautology* . . . *the theory is unbeatable because it is allowed to interpret our observations* while they are being made or recorded. Once this has been done, it is only logical that the data so collected cannot be used to question the interpretation, being a product of it."<sup>31</sup>

As we will see, uniformitarianism over the past 150 years has been used not to enlighten but force the world into its own rigid structure and has created a vision of reality that is not only unscientific in its outlook, but antiscientific in its behavior. The following chapters will well demonstrate this fact.

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<sup>31</sup>R. Brady, "Dogma and Doubt," *Biological J. Linnean Society*, Vol. 17, (1982), p. 90.

## THE AGE OF MAN IN AMERICA

"The disturbing reality is that for none of the thousands of well documented extinctions in the geologic past do we have a solid explanation of why the extinction occurred. We have many proposals in specific cases, of course: trilobites died out because of competition from newly evolved fish; dinosaurs were too big or too stupid; the antlers of Irish elk became too cumbersome. These are all plausible scenarios, but no matter how plausible, they cannot be shown to be true beyond reasonable doubt. Equally plausible alternative scenarios can be invented with ease, and none has predictive power in the sense that it can show, *à priori*, that a given species or anatomical type was destined to go extinct."<sup>32</sup>

Charles Lyell, upon his realization that there had been a recent extinction of the giant animals suggested that the extermination via hunting by man "is the first idea presented to the mind of almost every naturalist."<sup>33</sup> Eleven years later, Richard Owen claimed that in the Americas, the extinction could have come about through the "appearance of mankind on a limited tract of land not before inhabited."<sup>34</sup>

The hunting hypothesis is among the most popular theories for the extinction of these elephants and was also presented by Alfred Russel Wallace:

" . . . the extinction of so many large mammalia is actually due to man's agency, *acting in co-operation with those general causes* which at the culmination of each geological era has led to the extinction of the larger and most specialized, or the most strangely modified forms."<sup>35</sup>

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<sup>32</sup>David M. Raup, *Extinction: Bad Genes or Good Luck*, *op. cit.*, p. 17.

<sup>33</sup>Charles Lyell, *A Second Visit to the United States of North America*, Vol. II, (New York, 1849), p. 259.

<sup>34</sup>Richard Owen, *Paleontology, or a Systematic Study of Extinct Animals and Their Geological Relations*, (Edinburgh, Scotland, 1860), p. 399.

<sup>35</sup>Alfred Russel Wallace, *The World of Life: A Manifestation of Creative Power, Directive Mind and Ultimate Purpose*, (New York, 1911), p. 264.

Henry Howorth, however, understood that hunting could not exterminate the megafauna.

"The [hunting extinction] view is in every way assuredly most unscientific, and unsupported by any fact known to me. It has been well criticized by Mr. Searles Wood, junior. 'Africa,' says Mr. Wood, 'has been from the remotest historical times peopled by numerous inhabitants, and to these the use of iron seems long to have been known; but until the ivory hunters, with fire-arms, and more recently with rifles and explosive bullets, began to persecute them, the African pachydermata seem to have maintained their numbers. Similarly the civilization of Southern Asia is very ancient, and the use of metals probably dates back there several thousand years; but what have the civilized Asiatics, with the accessories of metal weapons and of the domesticated horse, done towards exterminating the Asiatic pachydermata and great felines? Modern sportsmen, with their destructive weapons, have done more toward this in half a century than has been done during thousands of years of antecedent civilization. Are we then to suppose that thousands of years before this civilization even commenced . . . the scattered tribes of men . . . of Europe, and of Northern and Central Asia, exterminated with their feeble weapons of bone and flint the gigantic pachydermata and felines of the Post-Glacial period? Fancy attacking a rhinoceros, whose hide will turn a rifle bullet, with a flint hatchet or a bone skewer."<sup>36</sup>

Nevertheless, years later, Carl Sauer, an outstanding researcher of the environment in the early part of this century, presented the theory that the early American native peoples killed off the megafauna. Vine Deloria, Jr., describes the theory thus:

"This 'overkill' idea originated in a form approaching its contemporary expression when Carl Sauer . . . suggested more than half a century ago that Paleo-Indian hunters had killed all the big-game animals which became extinct in the late Pleistocene era. Sauer thought that through the use of fire drives in which they both cleared large tracts of land for prairie grazing and eliminated the mammoth, mastodon, and a variety of other creatures, Indians had been responsible for the demise of the mammoth and mastodon. Sauer cited no large kill sites, mixed forest and plains animals indiscriminately, and could only point to the practice of some historic Indian tribe in burning grasses to encourage new growth the following year as evidence that Indians had ever burned areas.

"Sauer was easily routed in his efforts to gain acceptance for this thesis by Loren C. Eiseley who wrote two articles raising questions that were never satisfactorily answered.<sup>37</sup> [These arguments will be presented below.]

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<sup>36</sup>Howorth, *The Mammoth and the Flood*, (London, 1887), p. 171.

<sup>37</sup>Vine Deloria, *Red Earth White Lies*, (New York, 1995), pp. 111-112.

To give the reader a taste of the way the hunting theory was presented to the public, I cite Dr. Frank C. Hibben whose description on this point reads as follows:

"The elephant whirled and trumpeted shrilly as he sighted the men beyond the burning grass. One of the hunters fitted a long spear to his spear-thrower. Swinging his body into the cast, the man hurled the javelin. It struck high behind the mammoth's foreleg. The flint point ripped through the inch-thick skin, shattering a rib, and bit deep into the lungs. A spout of blood blew out of the mammoth's trunk. The other men shouted, and rushed in for the kill.

"The beast whirled to face them. His 10-foot-long tusk swept around. As a man closed to launch another spear, one tusk struck him on his side. In the same instance, the mammoth's trunk lashed at the man's head. His body broke like a shattered reed.

"The animal thrust his tusks again and again into the shapeless mass that had been a human, but now other spears thudded into his chest. One flint point, striking low behind the foreleg, pierced the great heart. Blood pumped out of the gash. The mammoth swayed. He trumpeted once again, blowing a plume of blood above his back. Then with a crash that shook the ground, the elephant fell on his side and died."<sup>38</sup>

John Upton Terrell, who presented this narrative, however, goes on to say, "Few hunters of today would attack an elephant with nothing more than a flint-tipped spear. The Ice Age hunter did it without hesitation."<sup>39</sup> This is the fiction regarding this theory. Let us begin to examine how much truth there really is to it. Is anyone here ready to take on an adult African elephant with a stone-pointed spear when safer game is available?

As Ward readily admits, "hunting and killing members of elephant herds had to be a very risky business. Why single out elephants when much other game is present."<sup>40</sup> Elsewhere he goes on to state:

"Were these people the great mammoth hunters of Jean Auel [the novelist] and other writers of popular fiction seem to imagine. . . .

"Clearly killing a mammoth while armed with only a stone-tipped spear (or even many stone-tipped spears) must have been no easy endeavor. How would you kill a charging mammoth or mastodon [or rhinoceros] with a spear?

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<sup>38</sup>Dr. Frank C. Hibben, "Was Ice Age Man a Game Hog?" *Denver Post*, (August 10, 1969) in John Upton Terrell's *American Indian Almanac*, (New York, 1971; reprint 1994), p. 10.

<sup>39</sup>*Ibid.*

<sup>40</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 134.

Head shots won't do, a spear thrown at the head of an elephant would never get through the thick bone of the skull."<sup>41</sup>

Of greatest importance, in order to secure the correlation of the extinction with the hypothetical arrival of man in the Americas 12,000 years ago from Asia across the Bering land bridge, one would have to possess unimpeachable evidence that man came into the Americas just prior to the extinction. If the early hunters had arrived much before, or it could be securely shown that man had lived in the Americas for many thousands of years prior to when the onslaught occurred, the overkill, or blitzkrieg hypothesis, would fall to pieces. One simply cannot have ancient man living in ecological harmony with these animals for many thousands of years and then, after doing so, suddenly begin a rampage of slaughter, out of the blue, for no apparent good reason. If he had lived in hunting harmony for a long time with these animals, he would have continued this advantageous, ecologically sound relationship, and always have a large supply of prey available to him as sustenance.

Ronald B. Parker explains that, if the timing of the extinction not coinciding with man's arrival in the Americas exhibits "a piece of evidence out of place in the time sequence, the theory may crumble."<sup>42</sup>

The earliest view of the scientific community was that man and mammoth were never contemporary with one another. According to Bernard Heuvelmanns,

"Cuvier's *Theory of the Revolution of the Globe*, by which it was *à priori* impossible for any creature of a past age to have survived, convinced most scientists in the beginning of the nineteenth century that the mammoth, whose fossil remains had been found almost everywhere, was a vanished species [which died out before man]. . . . Nevertheless, John Frere had shown in 1797 that man was contemporary with large extinct animals when he found in Sussex worked flint weapons mixed with their bones. In 1823 the French geologist, Ami Boué, sent Cuvier a human skeleton excavated from ancient deposits which also contained the remains of extinct animals. Cuvier hushed up the awkward discovery. Similar discoveries soon became even more frequent throughout the nineteenth century. Yet in 1863, Elie de Beaumont, Permanent Secretary of the Académie des Sciences, was still able to state categorically: 'I do not think the human species was contemporary with *Elephas primigenius*. Cuvier's opinion was the work of a genius, it has not been overthrown':

"A year later Edouard Lartet, the founder of human paleontology, whose fundamental thesis the Académie had refused to publish, discovered at La Madeleine a flat piece of ivory upon which a Stone Age man had engraved a masterly drawing of a mammoth. Naturally, this was thought to be a fake. It clearly shows the fatty hump on the skull, which at that time no one knew

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<sup>41</sup>*Ibid.*, pp. 126-127.

<sup>42</sup>Ronald B. Parker, *The Tenth Muse, The Pursuit of Earth Science*, (New York, 1986), pp. 173-174.

anything about. Not until the Berezovka mammoth was dissected in 1901 was it conclusively proved to be genuine."<sup>43</sup>

The history of the time in which the mammoth lived, as related to man, has a colorful and interesting history which will be disclosed below. The point I wish to emphasize is that once a powerful and illustrious scientist makes a statement, it often becomes dogma for generations to follow and acts to seriously impede any progress toward solution based on any new evidence. The following discussion is, therefore, germane not only as science, but as history about the time in which the mammoths lived in the arctic.

One, therefore, ought to know fairly precisely the dating of man's arrival in the Americas and the correct date for the extinction; the extinction should be closely timed to the arrival of human hunters. Donald K. Grayson, however, shows, "The timing of Ice Age extinctions is really very poorly understood. . . . Radio carbon chronologies are bad in North America and worse in Europe."<sup>44</sup> However, if it could be firmly established that man lived in the Americas for longer than 10,000 to 12,000 years, the synchrony of hunters arriving in America, and the onset and, soon thereafter, extinction or overkill thesis, would fail. The overkill hypothesis is based, in large measure, on this synchrony which has become archeological dogma over the past 50 years, namely that man has not been in North America prior to about 12,000 years B.P., when he crossed the land bridge at the Bering Strait and then began this slaughter.

"The quest for the origin of the Americans has been going on ever since Columbus. . . . Although the *Bible* doesn't mention them [the Indians], the Pope in 1512 officially declared them to be descendants of Adam and Eve. New England Protestant cleric Cotton Mather disagreed; he believed they were brought here by the devil. Others linked them with the 'lost ten tribes' of Israel, with ancient Greeks, Trojans, Egyptians, Norwegians, and the inhabitants of the mythical continents of Atlantis and Mu."<sup>45</sup>

But the 12,000 year date was not conceived of until early in the 20th century. According to Roger Lewin,

"'The origins of American Indians is a topic that has occupied the minds of western scholars for nearly 500 years,' explains Richard Morland of the Canadian Museum in Ottawa. In the late eighteenth century, for instance,

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<sup>43</sup>Bernard Heuvelmanns, *On the Track of unknown Animals*, abridged ed., (New York, 1965), p. 207.

<sup>44</sup>B. Bower, "Extinctions on Ice," *Science News*, Vol. 132, (1987), p. 285.

<sup>45</sup>Ronald Schiller, *Distant Secrets*, (New York, 1989), p. 38.

Thomas Jefferson became convinced on the basis of archaeological and linguistic evidence that America Indians shared a common origin with northern Asiatics. And the diversity of America Indian languages persuaded him that they had a very long history. Through Darwin's time, scholars even suggested that American Indian history went back perhaps as far as 100,000 years. This notion was squashed at the turn of the century by American anthropologists W. H. Holmes and Ales Hrdlicka."<sup>46</sup>

The first hurdle to overcome was the opposition of Ales Hrdlicka, like Cuvier, he said man had not been in America with the mammoth.

"The main authority on these topics . . . was the Czech-born anthropologist Ales Hrdlicka, who in 1903 became the Smithsonian Institution's first curator of physical anthropology. Hrdlicka, a brilliant scientist and a devastating debater, systematically examined and confidently dismissed all evidence offered to show man's antiquity in the New World. He brushed aside . . . discoveries [of human relics found with mammoths or other ancient extinct creatures] by saying that the human relics had accidentally become mixed with those of extinct animals. . . .

"As he grew older his opinions hardened into prejudices, which he proclaimed so vehemently that most scientists thought it would be improper to hold an opposing belief. No one wanted to contradict fiery old Hrdlicka, for when anyone dared to suggest that men *had* lived in the United States in the time of big extinct mammals, Hrdlicka immediately loosed a barrage of denunciation."<sup>47</sup>

The point I wish to stress is that when a powerful figure like Hrdlicka intimidates professionals in less powerful and less secure positions, then good science cannot be done. And I stress that this is one of the basic problems endemic to modern science. As Robert Silverberg shows, as Hrdlicka,

"grew older his opinions hardened into prejudices, and he proclaimed his ideas so vehemently and with such a show of authority that it became professionally dangerous for any scientist to try to contradict them. Only a brave archeologist or a foolish one would dare to tangle with Hrdlicka. One archeologist of the 1920's warned his pupils, not entirely jokingly, 'if you ever

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<sup>46</sup>Roger Lewin, *In the Age of Mankind*, (Washington, D. C., 1988), p. 159.

<sup>47</sup>Robert Silverberg, *Mammoths, Mastodons and Man*, (New York, 1970), pp. 200-201.

find evidence of human life in [America] in a context which is ancient, bury it carefully, but don't forget about it!""<sup>48</sup>

A marvelous story about Hrdlicka is told by paleontologist, Louis Leakey:

"Back in 1929-1930 when I was teaching students at the University of Cambridge . . . I began to tell my students that man must have been in the New World [for] at least 15,000 years. I shall never forget when Ales Hrdlicka, that great man from the Smithsonian Institution, happened to be at Cambridge, and he was told by my professor (I was only a student supervisor) that Dr. Leakey was telling students that man must have been in America 15,000 or more years ago. He burst into my rooms—he didn't even wait to shake hands,

"Hrdlicka said, 'Leakey, what's this I hear? Are you preaching heresy?'

"'No, Sir!' said Leakey.

"Hrdlicka replied, 'You are! You are telling students that man was in America 15,000 years ago. What evidence have you?'

"Leakey answered, 'No positive evidence. Purely circumstantial evidence. But with man from Alaska to Cape Horn, with many different languages and at least two civilizations, it is not possible that he was present only the few thousand years that you at present allow.'"<sup>49</sup>

Leakey was lucky that he survived this encounter. Others were not so lucky. Just imagine the arrogance of Hrdlicka breaking into someone's rooms without first knocking at the door, the lack of control in this case exhibits disturbed behavior.

For any reader who believes I am being unduly severe on Hrdlicka, painting him as a raving neurotic. I add this item by C. W. Ceram:

"He [Hrdlicka] was an odd bird in other respects also. For example, he made it a rule that all his associates had to will their skulls to science, but in his

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<sup>48</sup>Robert Silverberg, *Clocks for the Ages*, (New York, 1971), p. 203.

<sup>49</sup>Michael A. Cremonese, Richard L. Thompson, *The Hidden History of the Human Race*, (Badger, Calif., 1994), p. 46.

own last will he stipulated that he was to be cremated, his ashes mingled with those of his first wife and deposited in an urn in the Smithsonian Institution."<sup>50</sup>

Hrdlicka had no qualms about destroying anyone that he felt endangered his views of the peopling of the New World. According to Lewin, G. Edward Lewis, a doctoral candidate at Yale University on an expedition to the Siwalik Hills of India, found fossils of a possible hominid which he dubbed *Ramapithecus*, or "Rama's age." Hrdlicka,

". . . chose to damn *Ramapithecus* in the pages of the *American Journal of Science* . . . where Lewis had published his claims for the fossil. In six short pages Hrdlicka tore into Lewis' work, accusing the young man of committing 'a series of errors' and reaching an 'utterly unjustifiable' conclusion. *Ramapithecus*, he said, was just an ape [and not a hominid]. . . .

"Hrdlicka, he [Lewis] says, 'thought he was the anointed and elect prophet who had been foreordained and chosen to make such discoveries and demolish the work of anyone else.' Hrdlicka's paper was somewhat self-contradictory, and says [Elwyn] Simons, [of Yale] 'scattered with blunders and naivetes.' 'The man didn't know what he was talking about,' recalls Lewis. 'So I could not take the paper's content seriously, but did take seriously the possibility of his damaging my reputation.'

"As an attempt to salvage his reputation Lewis penned 'an unhurried and temperate reply.' The rebuttal never found the printed page, however, because the editor of the *American Journal of Science*, Lewis' own supervisor, [Richard Swann] Lull, declined to accept it. 'They refused to publish it,' says Lewis, 'although they admitted that I had written nothing offensive, because they said Hrdlicka was an important man, and I was a young man whose reputation would be damaged . . . inasmuch as the baldly stated facts and courteous comments would make him look like a fool!' Lewis' thesis which is described by [David] Pilbeam [a British anthropologist] as 'a very good piece of work' and by Simons as 'the best opinion people could reach at the time'—was never published. . . .

"Hrdlicka had good reason to want to discredit Lewis' work, says Frank Spencer, a scholar of this period of the history of paleontology and of Hrdlicka in particular. 'It has nothing to do with the shape of the jaw,' he suggests. 'It had to do with where the jaw came from—namely, the fringes of Central Asia.' In Hrdlicka's view, the western part of the Old World was the wellspring of human origins. Everything in his scheme depended upon this, including *his ideas on the eventual peopling of the New World*. To have the first hominids appearing in the eastern part of the Old World [so they would arrive in the New World prior to

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<sup>50</sup>C. W. Ceram, *The First Americans*, (New York, 1971), p. 252.

12,000 B.P.] was therefore simply unacceptable. 'So he did a hatchet job on Lewis' work,' says Spencer."<sup>51</sup> (Emphasis added)

Ceram describes Hrdlicka's behavior thus:

"Ales Hrdlicka of the Bureau of Ethnology in Washington, blocked all research into the past for a whole generation. . . .

"He was ruthless in enforcing his dominance upon younger men. . . .

"Even in 1928, by which time the importance of the Folsom find was clear to everyone, Hrdlicka had the temerity to decree at a meeting of the New York Academy that there could not have been a Paleo-Indian (as we call the people who hunted the now extinct animals). 'With his back to the wall, Hrdlicka was denying everything to maintain his position that man could be anything, anything at all, but not ancient in America,' [Edwin N.] Wilmsen says. But eventually the finds accumulated to such an extent that even the skeptics had to bow to the evidence."<sup>52</sup>

As we will see, the advocates of the overkill theory are just as avid in their denial that ancient man was in the Americas prior to 12,000 years ago and may deny anything, anything at all, to maintain their position.

I have added this material to show the nature of how scientific debates about anthropology are often carried out by disturbed scholars. Velikovskians are quite familiar with dictatorial types like Hrdlicka. But as we proceed, we will learn Hrdlicka is only one of a long line of angry scientists for whom opposition brings out this kind of behavior.

In time, however, discoveries of the Clovis people together, with extinct megafauna bones in America, could not be denied, but the conclusion and overall dogma was that this could go back no more than to around 12,000 years B.P. Cracks in this time constraint then began to appear. Of particular importance are two archeological discoveries in North America, that undermine this time constraint. One is at Calico in California, and the other is in a location in the Yukon near the Old Crow River.

"Two periods of human occupation have been dated at Calico. From about 15,000 to 20,000 years ago the area was inhabited by what [R. D.] Simpson suggests was a hunting-gathering people with more sophisticated tools, including stone flaked on both sides. In deeper layers estimated to be at least 200,000

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<sup>51</sup>Roger Lewin, *Bones of Contention*, (New York, 1987) pp. 88-89.

<sup>52</sup>Ceram, *The First Americans*, *op. cit.*, pp. 252-253.

years old are the simpler flakes of people she says, who probably gathered plants and other foods."<sup>53</sup>

To add to this, archeological work carried out in a rock shelter in Meadowcroft, Pennsylvania, J. M. Adovasio and his colleagues reported that they have 50 correlated consistent dates some of which were derived by employing accelerator mass spectrometry, that place man at that site 14,000 or 14,500 years ago.<sup>54</sup>

Grayson describes the Meadowcroft research this way.

"The deepest Meadowcroft deposits appear to date about 31,000 years ago. . . . Indeed, Meadowcroft is one of the best-dated archaeological sites in the world, Adovasio having obtained 52 radiocarbon dates for the site, dates that range from 175 years ago at the top . . . to 31,000 years ago at the bottom.

"These dates produce a consistent picture of the accumulation of deposits in Meadowcroft, since, with extremely rare exceptions, as the deposits get deeper, the dates get older, just as should happen."<sup>55</sup>

In addition, as far away as Chile, in South America at a site near Monte Verde, strong evidence that it was occupied by humans about 12,000 to 13,000 years ago was uncovered. If ancient man had crossed the Bering Strait 12,000 B.P., they would have taken at a minimum a thousand years to migrate down to Monte Verde. Significantly, radiocarbon dates at the dig go back 33,000 years.<sup>56</sup>

To show the depth of absurdity to which advocates of the idea that man was in the Americas no earlier than 12,000 years ago, I cite *Science Frontiers*, No. 105 for May-Jun 1996, page 2 titled "Darwinism in Archeology."

"Archeologists were initially attracted to Pedra Furada, in northeastern Brazil. . . . But it is not the rock art that is controversial about Pedra Furada; it is the 595 pieces of quartz selected by French archeologist N. Guidon. These bits of stone closely resemble human-crafted choppers, scrapers, and cutting tools. Indeed, if they had been found in more recent deposits, they would have been judged 'man-made' by everyone. The trouble is that Guidon has dated them at 50,000 B.P.—a date mainstream archeologists cannot swallow. . . .

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<sup>53</sup>Bruce Bower, "Flakes, Breaks, and the First Americans," *Science News*, Vol. 131, (1987), p. 172.

<sup>54</sup>J. M. Adovasio, *et al.*, "The Meadowcroft Rock Shelter Radiocarbon Chronology, 1975-1990." *American Antiquity*, Vol. 55, (1990), p. 348.

<sup>55</sup>Donald K. Grayson, *The Desert's Past*, (Washington, D.C., 1993), p. 59.

<sup>56</sup>Richard E. Morlan, "Pleistocene South America," *Science*, Vol. 249, (1990), p. 937: see a review of the book *Monte Verde. A Late Pleistocene Settlement in Chile*, Tom D. Dillehay, (Washington, D.C., 1989).

"How are the Pedra Furada chipped stoned explained by the mainstream archaeologists? They are geofacts, not artifacts. They were created when quartzite rocks were released by erosion and fell off cliffs to be smashed upon impact below. Gravity and not the human hand broke the quartz into pieces that just happen to look like prehistoric tools. F. Parenti, a coworker of Guidon, has tried to exorcise the geofact argument, which is used whenever tools are 'too old' by showing that the 595 pieces of quartz have characteristics quite unlike those created by natural flaking.

"The doubters are unswayed. You see, despite Parenti's analysis there remains a minute chance that a falling rock *will* fracture into pieces one of which will look human made. Maybe only one falling rock in 10,000 will fracture 'unnaturally'; make it one in 10,000,000; it doesn't matter.

"Of course, no matter how rare the chances, given sufficient time and raw material—Pedra Furada had plenty of both—nature can magnify even the slimmest odds to the point where geofacts occur in detectable frequencies.'

"In this argument, you see how our title 'Darwinism in Archeology' came to be. Random events (rock falls *or* mutations) plus a sorting mechanism (human selection or natural selection) can produce geofacts *or* new species. This sort of explanatory mechanism can, in principle, explain just about anything (Meltzer, David; 'Stones of Contention,' *New Scientist*, p. 31, June 24, 1995.)

"R. Dennell and L. Hurcombe, two archeologists faced with the geofact problem at their Pakistan dig, tried to solve it experimentally. They deliberately dropped quartzite rocks from heights onto hard surfaces. They concluded,

"While conceding that had we conducted the experiment with a thousand, ten thousand, or a hundred thousand stones, a few might have fractures, we would nevertheless maintain that the chances of any showing multiple, multi-directional flaking and all with bulbs of percussion are as remote as the proverbial monkey typing Shakespeare. (Dennell, Robin, and Hurcombe, Linda; "Comment on Pedra Furada," *Antiquity*, 69:604 1995)."

No argument by those who refuse to face the mounting evidence that man was in America earlier than 12,000 years ago is too absurd to be excluded. Like all experts, they can twist the evidence to say just about anything they want it to say.

To damage Guidon's evidence at Pedra Furada, D. J. Meltzer, *et al.*, who visited the site, still claimed the artifacts were really geofacts.<sup>57</sup> The reply by Guidon, *et la.*, was blistering. They accused their critics of having their facts wrong and being biased because of their allegiance to the 12,000 year people-in-America paradigm. Guidon and Pessis called Meltzer, *et al.*'s published work "Falsehood or Untruth" and then stated bluntly,

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<sup>57</sup>D. J. Meltzer, *et al.*, "On a Pleistocene Human Occupation at Pedra Furada, Brazil," *Antiquity*, Vol. 68 (1994), p. 695.

"The article by Meltzer, *et al.*, (1994) is based on partial data and false information (highlighted below). Its battery of questions takes us by surprise; none of the three colleagues [who criticized our work] came up with these questions during the 1993 meeting—mounted precisely to generate direct dialogue on the peopling of America. We disagree with their statement, 'the comments on Pedra Furada are not offered lightly' (p. 696). The comments are worthless because they are based on partial and incorrect knowledge.

"We believe that the initial intention of the authors was different; they got carried away into an exercise in academic style from a fragile scientific base of fragmentary data and with a skepticism born of a subjective conviction."<sup>58</sup>

Jeffrey Goodman's comments well sums up the dogmatism attached to the dismissal of ancient stone artifacts that challenge the 12,000 year barrier.

"Even more incriminating evidence against the generally accepted . . . theory emerged when it became clear that findings at many sites were challenging the sanctity of the 10,000 B.C. entry date, the 'official' date for man's first appearance in the New World. These new sites suggested much earlier dates, but since they didn't yield beautifully fashioned pressure flaking points such as the Clovis and Folsom sites had, they were immediately suspect. Instead of spear points these sites contained very crude chipped stone tools such as choppers, scrapers, and simple stone flakes. A much more primitive manufacturer was pictured, and to some , the crudeness of these materials indicted that they weren't made by man at all, but by nature imitating man via such natural processes as thermal flaking from frost and heat and from rocks tumbling in streams or down hills or being ground up in mud flows, though there weren't any studies to support this contention. There simply were no scientific grounds for contending that nature could fashion stones in a way indistinguishable from man. This led one of the authorities in the field to say that 'certain archaeologists wouldn't accept any really crude and early stone tools even if they somehow saw the tools being made with their own eyes.'"<sup>59</sup>

In fact, there has been an organized and concerted effort to deny the evidence of man in America prior to 12,000 B.P. by a group William R. Corliss dubs the Clovis Police:

"A new group of law-enforcers has been formed. Although the Clovis Police do not carry guns, they [like Hrdlicka] will make sure that all who stray from the archeological mainstream will be held up for censure. (Does this mean denial of funds, access to journals?) The 'law' that the Clovis Police will enforce

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<sup>58</sup>N. Guidon, *et al.*, "Nature and the Age of Deposits in Pedra Furada, Brazil: Reply to Meltzer Adovasio & Dillehay," *Antiquity*, Vol. 70, (1996), p. 408ff]

<sup>59</sup>Jeffrey Goodman, *American Genesis*, (New York, 1981), p. 69.

says that humans did not enter the New World before 12,000 B.P.—the oldest date attributed to the Clovis people. . . . The members of the Clovis squad and their objectives can be found in a recent issue of *Science*, [by] Marshall, Eliot, "Clovis Counterrevolution" [Vol.] 249 [p.] 738, 1990."<sup>60</sup>

The Clovis Police squad's totalitarian manifesto has evidently borne fruit as presented by R. Bonnischsen of the University of Maine.

"Numerous meritorious grant proposals have been rejected because their goals and objectives were incompatible with entrenched academic opinion. . . . At least five South American archeologists admitted that they are suppressing pre-12,000-year-old data out of fear that their funds will be cut off by American colleagues who endorse the short—chronology school of thought."<sup>61</sup>

Warwick Bray, in "The Paleo-Indian Debate," in *Nature* shows just how strongly advocates of the view that man could only be in the Americas no earlier than 12,000 years ago quotes anthropologist E. Leach who said of the way they handle data and evidence:

"Justification in terms of scientific methodology is in part self-deception, for when the figures turn out wrong [regarding man in America prior to 12,000 B.P.] the true believer will always shuffle the figures; when contrary evidence turns up he throws doubt upon the credentials of the investigator."<sup>62</sup>

Let it be made absolutely clear that some scientists will do anything to one of their colleagues who presents evidence that will overturn the paradigm to which they have invested their professional lives. As Vine Deloria shows.

"The most blatant incident concerned Dr. Thomas Lee of Canada. Excavations were made at a site in Canada, Sheguiandah, between 1951 and 1955 by Lee, an anthropologist working at the National Museum of Canada. Preliminary evidence indicated the site might be between 30,000 and 100,000 years old.

"The evidence not only conflicted with accepted doctrine, it would have made it necessary to revise estimates of the stages of North American glaciation. The scientific establishment went after Lee. He lost his position at the museum

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<sup>60</sup>William R. Corliss, *Science Frontiers*, (Glen Arm, Md, 1994), p. 22.

<sup>61</sup>John Wilford Noble, "Findings Plunge Archeology of the Americas into Turmoil," *The New York Times*, (May 30, 1989), p. C10.

<sup>62</sup>Warwick Bray, "The PaleoIndian Debate," *Nature*, Vol. 332, (1988), p. 107.

and some of his papers on the discovery were 'lost.' 'I was hounded from my Canadian government position by certain American citizens on both sides of the border and driven into eight long years of blacklisting, and enforced unemployment,' Lee wrote."<sup>63</sup>

Michael A. Cremo and Richard L. Thompson describe what happened to Lee thus:

"In the early 1950's, Thomas E. Lee of the National Museum of Canada found advanced stone tools in glacier deposits at Sheguiandah, on Manitoulin Island in northern Lake Huron. Geologists John Sanford of Wayne State University argued that the oldest Sheguiandah tools were at least 65,000 years old and might be as much as 125,000 years old. For those adhering to standard views on North American prehistory, such ages were unacceptable. Humans supposedly entered North America from Siberia about 12,000 years ago.

"Thomas E. Lee complained: 'The site's discoverer [Lee] was hounded from his Civil Service position into prolonged unemployment; publication outlets were cut off; the evidence was misrepresented by several prominent authors . . . ; the tons of artifacts vanished into storage bins of the National Museum of Canada; for refusing to fire [Lee] the discoverer, the Director of the National Museum who had proposed having a monograph on the site published, was himself fired and driven into exile; official positions of prestige and power were exercised in an effort to gain control over just six Sheguiandah specimens that had not gone under cover; and the site has been turned into a tourist resort . . . Sheguiandah would have forced embarrassing admissions that the Brahmins did not know everything. It would have forced the rewriting of almost every book in the business. It had to be killed it was killed."<sup>64</sup>

In commenting on Cremo and Thompson's book, Bradley T. Lepper admits:

"Cremo and Thompson are right about the extreme conservatism of many archaeologists and physical anthropologists. While an undergraduate at a prominent southwest university, I participated in classroom discussions about the claims for a very early [prior to 12,000 B.P.] occupation at the Timlin site (in New York) which had just been announced. The professor surprised me when she stated flatly that if the dates were correct then it was 'obviously not a site' [of early man]. The dismissal of the possibility of such an ancient site without an

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<sup>63</sup>Vine Deloria, *Red Earth White Lies*, (New York, 1995) p. 73. See also, Thomas Elee, "Sheguiandah as Viewed in 1974." *NEARA Newsletter*, Vol. 9, (1974), pp. 34-37.

<sup>64</sup>Michael A. Cremo, Richard L. Thompson, *The Hidden History of the Human Race*, *op. cit.*, p. XVIII.

examination of the data or even a careful reading of the published claim is dogmatism. . . ."65

A typical description of how this suppressive behavior is exerted is related to the work of George Carter of Texas A and M University who dug up an

". . . early stone tool industry reminiscent of the European eoliths . . . discovered . . . in the 1950's at the Texas Street excavation in San Diego. At this site, Carter claimed to have found hearths, and crude stone tools at levels corresponding to the last interglacial period some 80,000-90,000 years ago. Critics scoffed at these claims, referring to Carter's alleged tools as products of nature, or 'cartifacts,' and Carter was later publicly defamed in a Harvard [University] course on 'Fantastic Archeology.' However, Carter gave clear criteria for distinguishing between his tools and naturally broken rocks, and lithic experts such as John Witthoft have endorsed his claims.

"In 1973, Carter conducted more extensive excavations at Texas Street and invited numerous archeologists to come and view the site firsthand. Almost none responded. Carter stated: 'San Diego State University adamantly, refused to look at work in its own backyard.'

"In 1960, an editor of *Science*, the journal of the American Academy for the Advancement of Science, asked Carter to submit an article about early humans in America. Carter did so, but when the editor sent the article out to two scholars for review they rejected it.

"Upon being informed of this by the editor Carter replied in a letter, dated February 2, 1960: 'I must assume that you had no idea of the intensity of feeling that reigns in the field. It is nearly hopeless to try to convey some idea of the status of the field of Early Man in America at the moment. But just for fun: I have a correspondent whose name I cannot use for though he thinks that I am right, he could lose his job for saying so. I have another anonymous correspondent who as a graduate student found evidence that would tend to prove me right. He and his fellow students buried the evidence. They were certain that to bring it in would cost them their chance for their Ph.D.'s. At a meeting, a young professional approached me to say, 'I hope you really pour it on them. I would say it if I dared, but it would cost me my job.' At another meeting, a young man sidled up to say, 'In dig *x* they found core tools like yours at the bottom but didn't published them.'"66

The authors go on to show on the same page and the next:

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<sup>65</sup>Bradley T. Lepper (Book Review), *Skeptic*, Vol. 4, No. 1 (1996), p. 99.

<sup>66</sup>Cremona and Thompson, *The Hidden History of The Human Race*, *op. cit.*, p. 45-46.

"The inhibiting effect of negative propaganda on the evaluation of Carter's discoveries is described by archeologist Brian Reeves, who wrote with his coauthors in 1986: 'Were actual artifacts uncovered at Texas Street, and is the site really Last Interglacial in age? . . . Because of the weight of critical 'evidence' preserved by established archeologists, the senior author [Reeves], like most other archaeologists, accepted the position of the skeptics uncritically dismissing the sites and the objects as natural phenomena.' But when he took the trouble to look at the evidence himself, Reeves changed his mind." (Emphasis added)

Furthermore, on an NBC television special, *The Mysterious Origins of Man*, presented in New York City in March 1996, it was revealed that archeologist Virginia Steen McIntyre had an experience very similar to Lee's. She had been digging in Mexico in 1966 and found human artifacts at a deep level of the excavation. These were dated by two dating methods, uranium and crystal. McIntyre had expected a 20,000 year age, but both dating methods gave a much greater age. Rather than deny the facts uncovered, she naively felt the unvarnished evidence should be presented via publication to the scientific world. What followed was that she was fired from her job, the site was closed and then filled in and she has been blacklisted from work in her field.

Commenting on the behavior of the establishment, Cremo and Thompson say of the Steen-McIntyre affair:

"The anomalous findings . . . resulted in personal abuse and professional penalties, including withholding of funds and loss of job, facilities and reputation for Virginia Steen McIntyre. Her case opens a rare window into the actual social processes of data suppression in paleoanthropology, processes that involve a great deal of conflict and hurt.

"A final note—we ourselves once tried to secure permission to reproduce photographs of the Hueyattaco artifacts in a publication. We were informed that permission would be denied if we intended to mention the 'lunatic fringe' date of 250,000 years."<sup>67</sup>

As reported in *The New York Times* by John Noble Wilford, Anna C. Roosevelt has found evidence in a cave in Brazil of a people unrelated to the Clovis who were in South America at the same time that the ancestors of the Clovis people settled in the United States. Dr. Betty J. Meggers, an influential archeologist at the Smithsonian Institution, has dogmatically and resolutely denied this evidence. Because Dr. Roosevelt is a descendant of President Theodore Roosevelt, she cannot be kicked out of the profession without considerable uproar and deep embarrassment to it. Her work received

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<sup>67</sup>*Ibid.*, p. 93.

". . . a scorching review in 1992 in *The Journal of Field Archeology* [at which] Dr. Meggers complained of its 'polemical tone' and 'extravagant claims.'

"On all sides archeologists are distressed that the conflict between Dr. Roosevelt and Dr. Meggers has descended into a name-calling feud. Dr. Roosevelt has repeatedly charged Dr. Meggers with using her influence to block those who do not share her views from working in the region."<sup>68</sup>

This is not related only to the early peopling of the Americas but also to the lifestyles of these early people who apparently were not hunters of the megafauna but "may have consumed more plants, fish and small game than had been assumed."<sup>69</sup> Jeff Hecht of *New Scientist*, describes Roosevelt's work thus:

"An ancient campsite in a Brazilian cave is forcing anthropologists to rethink their ideas about the history of human settlement in the Americas.

"The traditional views that all native Americans descended from a group called the Clovis people who crossed the Bering Strait some 11,500 years ago. . . . But an international team headed by Anna Roosevelt of the Field Museum in Chicago has found that people living in the Amazon at about the same time as Clovis culture had a different lifestyle and used quite different tools. . . .

". . . although nobody has found Clovis tools in South America, most early human sites in the continent have been found in the dry or temperate zones that the Clovis people seemed to favour—leading anthropologists to assume that the first South Americans were from Clovis stock.

"Roosevelt decided to look for human artifacts in tropical rainforests, which Paleo-Indian researchers have rarely explored. After reading 19th century accounts of stone tools and cave paintings in the Amazon, she teamed up with South American anthropologists to locate a cave at Monte Alegre [Brazil], several hundred kilometers from the present mouth of the Amazon which contained a wealth of human artifacts. . . .

"Evidence of early humans includes rock paintings and debris in 2.5 metres [8 feet] of soil on the floor of the cave. Stone spearheads found in the cave differ from Clovis tools: They are triangular and have backwards-facing barbs. . . .

"In addition, the researchers excavated wood fragments, charcoal, remains of fruit, nut shells, and the remains of many different animals, including birds, mammals, amphibians, fish and shellfish. The oldest debris dates from 11,145 years ago. Roosevelt says that the remains "point . . . to broad-spectrum foraging," rather than the hunting associated with Clovis culture.

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<sup>68</sup>John Noble Wilford, "Sharp and to the Point in Amazonia," *The New York Times*, (April 23, 1996), p. C8.

<sup>69</sup>B. Bower, "Amazon Cave Yields Ancient Culture." *Science News*, Vol. 149 (April 20, 1996), p. 244.

"Many other specialists had already questioned the traditional view that the earliest Americans were big game hunters. 'They must have been foraging as well,' says John Hoffecker of the Argonne National Laboratory in Illinois. He notes that larger animal bones are preserved better than those of smaller animals, while plant remains rarely survive."<sup>70</sup>

The evidence thoroughly contradicts the hunting hypothesis on two levels. First, it shows that people were in South America about 350 years after Clovis people supposedly crossed the Bering Strait. One would have expected them to be in South America, at the very least, 1,000 years later. If they descended from Clovis people, why didn't they use the same tools? After all, Clovis tools did not change greatly while they inhabited North America. This suggests these Amazonians were not descendants of the Clovis.

The reasons, therefore, for the behavior of those who oppose Roosevelt's research, especially those who support the hunting hypothesis, is understandable. Roosevelt's research is destroying their life's work and they simply don't know how to get rid of her without showing the world that their science is not science but institutionalized dogma.

Not only does Dr. Roosevelt's work show that Amerindians were not extensively big-game hunters, but after a half century of obstruction, the 12,000 year wall is beginning to crumble. As reported by John Noble Wilford, Monte Verde was occupied by man at least 13,000 years ago!<sup>71</sup> This will lead, I believe, to finally destroying the Clovis Police's mandate and in a few years, the admission will be made that man was in America long before the blitzkrieg hunting theory allows and will deeply undercut it and kill it. According to the report, the people at Monte Verde were also not extensively big-game hunters.

". . . a group of 20 to 30 people occupied Monte Verde for a year or so. They lived in shelters covered in animal hides. They gathered berries in spring, chestnuts in fall, and also ate potatoes, mushrooms, and marsh grasses. They hunted small game, and also ancestors of the llama, and sometimes went down to the Pacific, 30 miles away, for shellfish. They were hunters and gatherers."<sup>72</sup>

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<sup>70</sup>Jeff Hecht, "You take the coast road . . ." *New Scientist*, (April 27, 1996), p. 21.

<sup>71</sup>John Noble Wilford, "Human Presence in America is Pushed Back a Millennium," *The New York Times*, (Tues., February 11, 1997), p. A1.

<sup>72</sup>*Ibid.*, p. C4.

Ward says, "The new South American record [from Brazil] shows people living in a jungle region . . . subsisting on berries, fruit, and other items, just as many local people today."<sup>73</sup>

This evidence of the age of the site and the hunter gathering behavior of the people is a second double blow to the hunting hypothesis. First, animals in America coexisted with man long before the extinction occurred. Second, the Indians were not extensively big game hunters. It will be interesting to see what those advocates of the overkill blitzkrieg concept will summon to grab their theory out of the jaws of this evidence. Reputations and the life work of a great many hunter school doyens are on the line.

A perfect example of how control is exerted by a senior researcher in anthropology on a younger is described by Kenneth Good with David Chanoff in their book, *Into the Heart*. Good, as a Ph.D. candidate, was sent into South American jungles to evaluate his mentor's thesis which was in debate. His mentor, Napoleon Chagnon, had claimed that a tribe of people, the Yanamama, were a wild, uncontrolled, fierce, murdering people. Marvin Harris, of Columbia University, had strongly opposed this concept of people being inherently violent, like the ancient hunters. Good was sent by Chagnon to document evidence that they were indeed killers. What Good discovered was that the evidence would not support Chagnon's thesis and what followed led to a confrontation in which Chagnon suggested that Good get a job doing other work "Because you're not going to get into any other anthropology department. I'll see to that," he said.<sup>74</sup>

To combat some of these allegations and many others I have presented above about the outrageous and reckless behavior of scientists, Jo Wodak and David Oldroyd, in a review of Cremo and Thompson's book cited above, claim:

"We concede that the science of paleoanthropology does not have an unblemished record, though that does not mean that it is riddled with fraud. It is true, however, that it is a branch of science that has been characterized by passionate controversies, and it has been peculiarly prone to the effect of the theory-ladenness of observations. It is also subject to large stories ('scenarios') have to be told on the basis of often limited or slender evidence."<sup>75</sup> [However Schiller admits]

". . . reconstructing the history of early man in America is in some respects a more speculative business than it is in Africa, and interpretations are more divergent. Controversies among anthropologists tend to be more numerous, more spirited, and sometimes downright nasty. The opinions expressed about

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<sup>73</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, pp. 120-121.

<sup>74</sup>Kenneth Good with David Chanoff, *Into the Heart*, (New York, 1991), p. 115.

<sup>75</sup>Jo Wodak, David Oldroyd, "'Vedic Creationism': A Further Twist to the Evolution Debate," *Social Studies of Science*, Vol. 26, (1996), p. 204.

their colleagues by some of the experts I interviewed verged on insult, and differences of opinion are so bitter that there are those who will not sit at the same table with others. It makes for lively, professional meetings."<sup>76</sup>

Given the prior evidence outlined of behavior that is academically and scientifically indefensible, it is rather clear that even when the actions of senior researchers are exposed, those within the field are constitutionally incapable of facing the facts. If these forms of behavior aren't addressed, then conditions can only become worse and inquisitorial conduct will continue to flourish.

Now all this behavior is not as unusual as it has been made out to be. Most scientists have great trouble dealing with such totalitarian actions and refuse to believe their beloved science is different than that of other human institutions. But these are workers who have never attempted to present evidence that thoroughly contradicts the reigning paradigm. Those who have challenged these deeply held theoretical constructs soon find that they are *persona non grata* in their field and become the subject of all the mechanisms of coercion, suppression and hostility expressed in politics.

Yet Paul S. Martin, the leading exponent of the overkill hypothesis, still claims, "If humans lived in the New World more than 12,000 years ago, there would be no secret about it."<sup>77</sup> How on Earth can one believe that these advocates of the hunting hypothesis believe or care anything about the tenets of good science when one can observe Lysenkoism being carried out in broad daylight and with the scientific press and the popular press being so unwilling to raise a chorus of denunciation to the public regarding these matters? By the lack of clear and forthright denunciation regarding this affront to science and decency the press's lack of vigor becomes a form of tacit collusion.

As anyone with sense can see, science and academia can act just as totalitarian and fascist as any dictatorial institution or regime. The true reason for this type of behavior meted out to Lee and McIntyre and others is that their finds pointed to the concept that man was in America in Mexico and Canada much earlier than accepted and destroyed the theory that man reached the middle Americas only 12,000 years ago.

But then in 1961, parts of human skeletons were uncovered in water laid sand in a valley in Alberta, Canada, which geologists claimed were at least 18,000 years old.<sup>78</sup> The bones of an infant of about four months old were found, including parts of the scapula, a collarbone, a fragment of femur, two ribs and two smashed vertebrae. These fossil remains were buried beneath 33 feet of alluvium which had a sheet of glacial till above it on the surface. The only way to interpret this was to suggest the child died and was either buried slowly or rapidly by alluvium. Then the ice sheet advanced and covered

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<sup>76</sup>Schiller, *Distant Secrets*, *op. cit.*, p. 39.

<sup>77</sup>William R. Corliss, *Science Frontiers*, *op. cit.*, p. 22.

<sup>78</sup>A. McS. Stalker, "Indications of Wisconsin and earlier man from the southwest Canadian Prairies," *Annals of the New York Academy of Sciences*, Vol. 288, (1977), pp. 119-136.

over the area with glacial till. The geologist, A. McS. Stalker, gave the date for the fossil as 30,000 to 40,000 years B.P., or perhaps 20,000 years B.P. The point that must be stressed is that "Each advance [by the ice sheet] is marked by a later of till."<sup>79</sup> Thus, the burial occurred prior to the last glacial advance.

To get around this impossible situation, the bones were radiocarbon dated to about 4,000 years old.<sup>80</sup> What was omitted about the date offered was that the bones had been kept in preservatives loaded with carbon-14 which would lower the age of the date. Although there are doubts about this date, nearby at a place called Medicine Hat, human stone artifacts were found and they, too, dated from between 17,000 to 20,000 years B.P. Naturally, these artifacts were dismissed as being caused by nature.

L. Krishtalka, a critic of the overkill theory, goes so far as to accuse the proponents of that concept of willfully culling the data.

"Their selective acceptance of only 'good' dates—those that fit the model (for example, dates of human beings in North America no older than 12,000 yr B.P., and those for mammoths no younger than 10,000 yr B.P.)—may play fast and loose with the evidence that doesn't fit."<sup>81</sup>

What all this displays is that evidence is playing less and less of a role in this scientific debate. The tactics involved are clearly aimed at winning by techniques that smack of intimidation and propaganda, the same behavior evidenced by Hrdlicka.

Nevertheless, other forms of evidence have also been presented that further suggest man was in the Americas long before the blitzkrieg occurred. According to James Shreeve,

"Since the 1930's, anthropologists have taken it as a fact that the first humans to cross the Bering land bridge and colonize the New World were the Clovis people, dating back some 11,500 years. . . . Genetic studies of mitochondrial DNA among American Indians suggest that at least some populations trace their occupation of the Americas back to between 42,000 and 21,000 years ago. More recently, a comparative study of grammatical structures in different language families suggested that humans reached the New World not long after the Cro-Magnons appeared in Western Europe." [Much earlier than 12,000 years ago.]<sup>82</sup>

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<sup>79</sup>Pielou, *After the Ice Age*, (Chicago, 1991), p. 114.

<sup>80</sup>R. M. Brown, *et al.*, "Accelerator <sup>14</sup>C dating of the Taber Child, *Canadian Journal of Archeology*, Vol. 7, (1983), pp. 233-7.

<sup>81</sup>L. Krishtalka, "*The Pleistocene Ways of Death*," a book review of *Quaternary Extinctions*, (1984) in *Nature*, Vol. 312, p. 226.

<sup>82</sup>James Shreeve, *The Neandertal Enigma*, (New York, 1995), p. 324.

The linguistic evidence puts native Americans back at least 35,000 years according to Ruth Gruhn.

"Study of aboriginal language distribution supports Knut Fladmark's hypothesis that the initial route of entry of people into the New World was along the Pacific coast rather than through the interior ice-free corridor. The greatest diversification of aboriginal languages, as indicated by a number of language isolates and major subdivisions of language phyla, is observed on the Pacific Northwest coast, in California on the northern Gulf of Mexico Coast, in Middle America, and in South America. Following a conventional principle of historical linguistics, it is assumed that the development of language diversification is proportional to time depth of human occupation of an area. A review of the greatest language diversification indicates a time depth of at least 35,000 years of human occupation of most of the Americas."<sup>83</sup>

Lewin discusses the DNA evidence showing man was in America long before the overkill hypothesis allows.

"DNA analysis of mitochondria present in the cells of North American Indian populations indicate that the Eskimo-Aleut and Nadene populations arrived about 7,500 years ago. The more geographically widespread Amerind population, however, seems to be descended from two separate influxes; the first about 30,000 years ago, the second about 10,000 years ago."<sup>84</sup>

That is, three forms of evidence—archeological dating, genetics, and linguistics—point to the fact that man was in the Americas long before the overkill hypothesis will allow. If each of the forms of evidence supported the hunting theory, there would never be a murmur of disagreement with the findings. Because the evidence is so often and so directly negative to their thesis, the overkill advocates contest each and every scintilla of it.

For example, "prehistorians . . . maintain that Clovic culture, and with it the skills and tools needed to hunt large animals efficiently, [only] developed south of the great ice sheets among primitive people already living there. . . . If overkill could only be

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<sup>83</sup>Ruth Gruhn, "Linguistic Evidence in Support of the Coastal Route of Earliest Entry into the New World," *Man*, Vol. 23, (1988), p. 77.

<sup>84</sup>Roger Lewin, "Mitochondria Tell the Tale of Migration to America," *New Scientist*, (Feb. 22, 1992), p. 16.

perpetrated by people of Clovis culture, and the ancient Beringians [of Alaska and Siberia] were too primitive, the extinctions in Beringia are left unexplained."<sup>85</sup>

The archeological research in Alaska indicates that the people living there lacked the skills, and especially the hunting tools, to destroy the megafauna. Only when these people arrived in the south do archaeologists find the artifacts that exhibit the advances necessary to hunt large mammals. Thus, the extinction in Siberian and Alaskan Beringia do not meet the requirements of the overkill theory.

In addition to all of this, there is the problem of getting Asiatic paleo-peoples into the Americas across the Bering land bridge. As Vine Deloria has pointed out, there is not one spark of solid evidence to support this contention.<sup>86</sup>

Guthrie succinctly points out that

"Archaeologists have discussed three barriers . . . limiting human colonization of the New World: (1) The northern line of archaeological sites seems to conform to . . . [a] limit of 60°N, mainly because there was insufficient [human] technology to carry on life in far northern environments. (2) The Bering Strait has been considered a barrier . . . (3) Continental ice sheets did separate Alaska from ice-free regions to the south [ern United States] for thousands of years."<sup>87</sup>

What all this suggests is that there is no archeological evidence of man in northeastern Siberia or Alaska dating to 12,000 years ago. This is the only evidence that would prove man came there at that time, but this lack of evidence has not stopped this dogma from being accepted by a host of archeologists and anthropologists. The other evidence is that one needs a fairly sophisticated level of technological development to move and inhabit regions north of about 60°N latitude which the scientists think these ancient peoples did not possess. As Helga Larsen and Froelich Rainey suggest, "No truly primitive group could exist under such [polar] conditions. Only by means of complex technology and through highly developed knowledge of natural phenomena could human beings penetrate the Arctic."<sup>88</sup> And lastly, the conditions across the Bering land bridge were hell on Earth. In spite of no evidence of man in these regions 12,000 years ago, in spite of man's supposed lack of technology to live above 60°N latitude, and the impossible conditions at the crossing area, this land bridge theory is accepted.

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<sup>85</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 260; see also, D. E. Drumond, "The Archaeology of Alaska and the Peopling of America," *Science*, Vol. 209, (1980), pp. 984-991.

<sup>86</sup>Vine Deloria, "Low Bridge Everybody Cross," *Red Earth White Lies*, *op. cit.*, pp. 81-107.

<sup>87</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, p. 277.

<sup>88</sup>Dan O'Neill, *The Firecracker Boys*, (New York, 1994), p. 1.

Jeffrey Goodman, in his book, *American Genesis*, has written an extremely readable and well-documented analysis of the Bering land bridge myth.<sup>89</sup> For the reader with an interest in the broad range of evidence which contradicts this anthropological dogma, I suggest that this insightful research be perused. The lack of evidence for the migration of man into America via this route, and the number of blatant assumptions elevated to the eminence of fact to support this thesis, is simply appalling.

As Ceram explains,

"It is significant that scholars no longer discuss the question of whether the first Americans came from Siberia; today that is regarded as conclusive. The theory has been around for a long time. . . . But the present certainty rests on a rather indirect type of proof: the fact that all other theories have been eliminated either as wrong or . . . as simply nonsensical."<sup>90</sup>

However, in *The New York Times* for March 4, 1997, page C6, John Noble Wilford reports that "scientists found evidence that early Stone Age people had managed to live in the bitter cold environment of Siberia as early as 300,000 years ago. Here . . . scientists were astonished because they had thought that Siberia had been beyond human occupation. . . ." If this evidence holds up, ancient man would have been able to arrive in the Americas prior to the 12,000 year barrier. The accumulating evidence strongly suggests ancient man was in America long before the extinction of the megafauna, and severely undermines the overkill hypothesis. This creates a double bind for the overkill hypothesis. If man could live in Ice Age Beringia early on, he could indeed hunt the megafauna. But if he could live there, he could easily have arrived in the Americas far earlier and this contradicts the hunting hypothesis.

No one (I need not go into this deeply), can ever know in advance that all other, or other future, theories have been eliminated. Because today's anthropologists believe that their Bering Strait conclusion is correct, based on nothing resembling solid evidence, is simply science by majority or science by consensus.

Goodman raises this provocative analysis about the Eskimo who arrived on the American continent about 7,500 years ago:

"There is something mysterious about why such struggling bands of lost or nomadic hunters forsook the animal supermarkets at their mercy and gave way to the impulse to march ever southward. *Why didn't the Eskimo, the latest*

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<sup>89</sup>Jeffrey Goodman, *American Genesis*, (New York, 1981), pp. 41-89.

<sup>90</sup>C. W. Ceram, *The First Americans*, *op. cit.*, p. 289.

*prehistoric immigrants to America, possess this impulse instead of acclimatizing themselves to the harsh rigors of the Arctic?"<sup>91</sup> (Emphasis added)*

Indeed, the game south of the tundra where the Eskimo lives would have been a great inducement to migrate south 7,500 years ago. But the Eskimos evidently hadn't read the book of the overkill hunting theory and followed the more abundant game south.

Nevertheless, let us assume that the Paleo-Indians did indeed arrive in the Americas just when the overkill advocates suggest. Does their theory fit the evidence? Kurten points to a lethal problem inherent in the theory. "According to the [overkill] model, at any given point [over which they passed] the Paleo-Indians would sweep through [a region] very rapidly and then be gone, yet a sequence from Clovis to Folsom [cultures], spanning over thousands of years can be traced. The model is too explosive to fit the facts."<sup>92</sup> But Martin's theory suggests these hunters sweeping through the land simply didn't remain in one place for very long to leave artifacts. The evidence contradicts what he is suggesting. As Pielou explains, "Hunters and hunted were simultaneously present in only a narrow, moving zone, which crossed any given spot of ground in a very short time (a few decades or centuries)."<sup>93</sup> The reason for this, according to Ward,

"The Clovis, with no ability to farm or gain sustenance other than through harvesting large game, may have left behind regions largely devoid of humans. There would have been smaller game to hunt, of course, . . . But if Martin and other proponents of the overkill hypothesis are correct, these would have not been the favored game of the Clovis [they were wary of humans and difficult to kill without great expenditure of effort] who were, after all, the not-too-distant descendants of Asians who subsisted on Mammoths and Mastodons."<sup>94</sup>

Therefore, the Paleo-Indians, as they slaughtered all the game before them, would follow their food supply from Alaska to Patagonia. There would have been no reason to stay settled in any area because the source of their lives—the food supply, the big animals—was ever before them and why stay where there is little sustenance when abundant meat on the hoof was more easily obtained by migrating to the herds up ahead? But the artifacts show that instead of moving south with the abundant food source, the Paleo-Indians stayed settled and almost immediately changed their habits of hunting the

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<sup>91</sup>Jeffrey Goodman, *American Genesis*, *op. cit.*, p. 63.

<sup>92</sup>Björn Kurten, *Before the Indians*, (New York, 1988), p. 138.

<sup>93</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 260.

<sup>94</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 147.

big animals in great abundance to hunting far fewer smaller animals and perhaps even turning to eating much more vegetation.

But why didn't those meat-eating hunters who were left behind realize that there were all kinds of other animals like buffalo, deer, horned sheep, musk oxen, grizzly bears, pumas, eagles, and antelope available to exterminate to the last one before they turned to eating vegetation? Apparently, they developed a hunting amnesia and forgot all the hunting techniques of the hunting culture that had sustained them earlier. They didn't kill off these residual, other forms of prey; they merely settled down and became root, herb and vegetable consumers while only hunting a few of these other animals, but not to extinction.

Those who advocate the hunting hypothesis are disregarding another basic, cultural fact. Ancient peoples, like modern, primitive tribes around the world, are highly cohesive; that is, they tend to stay together for protection, social custom, and familial relationships. Being ostracized from the tribe is one of the great fears of primitive people. So much of their lives is tied up in the folk culture that banishment was akin to the sentence of social and psychological death.

Schiller, who supports early American man as a hunter, succinctly describes the situation thus:

" . . . the 12,000-year-old debate of man's arrival in the New World has a dwindling number of supporters. It conflicts with the almost certain 17,600 B.C. median date of human occupancy in the Pennsylvania rockshelter, and the fairly persuasive 32,000-year ages ascribed to the human evidence found in Brazil and Chile. Besides, anthropologists say, it is unlikely that in a mere thousand years, without knowing where they were going or any known reason for haste, the Indians could have spread throughout the whole of North and South America, exterminating every now extinct animal en route. It would have taken far longer, the experts calculate, for the migrants saddled with household goods and families, to move long distances and resettle. They would have had to acclimate themselves to each new environment they entered, ranging from frozen tundra to steaming jungle; to devise new strategies for hunting and gathering animals and plants; and to experiment with unfamiliar raw materials and develop new lifestyles. . . .

"The scenario for the peopling of America that most authorities now accept has the first humans trickling across the land bridge from Asia between 45,000 and 40,000 years ago. . . .

"The cultural history of the early Americans is better understood. They were hunters who supplemented their meat diet with fish, which they caught with bone hooks, harpoons and nets, and with seeds, roots, berries, mollusks, insects, and anything else edible."<sup>95</sup>

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<sup>95</sup>Ronald Schiller, *Distant Secrets*, *op. cit.*, p. 44-46.

Schiller calls Paul Martin and Vance Haynes proponents of the 12,000 date "diehards."<sup>96</sup>

Instead of leaving large remnants of the population behind to live off an impoverished, over hunted variety of prey, the tribes would have stayed together as a group and thus not show continuous habitation of the areas over which they swept. But this is not the case.

The evidence clearly indicates that man was in the Americas much earlier than 12,000 years ago and, therefore, the hunting hypothesis is invalid. Let us, nevertheless, examine the hunting theory from inside to show how it fails on its very own terms.

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<sup>96</sup>*Ibid.*, p. 44.

## THE HUNTING OR BLITZKRIEG THEORY

One of the main arguments of the overkill hypothesis is that the animals slaughtered, such as camels, llamas, two genera of deer, two genera of pronghorn, stag-moose, shrub-oxen, mastodons, mammoths, and horses, which became extinct in North America "had lived . . . for more than one million years in an environment devoid of ruthless, expert human hunters. . . . They never evolved the art of coexisting with so ruthless a predator."<sup>97</sup>

When we compare this to those that survived, such as "bison, moose, wapiti, or elk, caribou, deer, pronghorn, musk ox, bighorn sheep, and mountain goat, all except pronghorn were immigrants from Asia; no doubt they were adapted to the presence of human hunters and [were] able to survive in spite of being hunted."<sup>98</sup> This does seem reasonable except for the fact that one of the survivors discussed, the musk ox, is part of the list. Musk oxen, when "threatened by predators . . . form a solid circle with their horns pointed outward. [This circle is called a Karre.] This is a good defense against wolves, but not against men with guns . . ." <sup>99</sup> and not against men with spears. According to English naturalist, Richard Perry,

"Alas, the karre, so admirably efficient against natural predators, proved to be an extravagantly suicidal defense against man the hunter. Over the centuries immense numbers of musk-oxen have been slaughtered, necessarily by Eskimos with the aid of dogs. And only after changing climatic conditions compelled [sic] the Eskimos of north-east Greenland to emigrate, were the oxen to make that region their most populous . . . .

"Usually, however, when approached by men and dogs, the oxen take up their traditional and defensive formation and form [a] square. Traditional but, as already noted, fatal in these circumstances because if one, and particularly the herd leader, is shot, the remainder [of the herd] stand around it and allow

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<sup>97</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 256.

<sup>98</sup>*Ibid.*

<sup>99</sup>Bernard Stonehouse, *North Pole South Pole*, (London, 1990), p. 97.

themselves to be slaughtered one by one. Indeed, if the hunter wants meat he is obliged to shoot the entire herd before he can obtain one beast."<sup>100</sup>

This information was known and published as long ago as 1885 by Frederick W. Schwatka in his book, *Nimrod in the North: Or, Hunting and Fishing Adventures in the Arctic Regions*. Schwatka wrote:

"As their numbers fall one by one the musk-oxen resolutely persist in their curious and singular mode of defense, presenting their ugly-looking horns toward as many points of the compass as their remaining numbers will allow. When only two are left, these, with rumps together, and facing from each other, will continue the unequal battle against the enemy, and even in the last 'forlorn hope' will back up against the largest pile of his dead and dying comrades, or against a large rock or snow-bank, and defy his pursuers, dogs and hunter, until his death. While the little calves are too young and feeble to take their places in the front ranks (that is, until they are about eight or nine months old) they occupy the hollow square or interior space formed by their defensive parents: but when their elders have perished in their defense, with an instinct born of their species, they will form the same circular order and show fight."<sup>101</sup>

Speaking of the musk-ox, Alwin Pedersen points out

"Although the musk-ox can defend itself well against the dog and the wolf, it is really no match for man. Although hunted continually, it is surprising that it has not yet learned that flight is its only safeguard. . . . It knows no other natural enemy except the wolf, and this it can deal with perfectly well. On the other hand, *it has not become adapted to dealing with man, and when it meets one it can only behave as it would towards a wolf.* (Emphasis added)

"Each time I have come across a herd of musk-ox they have shown themselves unable to make a decision; they have not known whether to remain where they were or to flee, and if they have decided to flee, it is at a time when they could all have been shot.

"When a musk-ox is killed the others are visibly disturbed, especially if it has been the leader. It is quite distressing to see these fine animals standing around the victim as though paralyzed and letting themselves be killed one by one. One cannot really talk of hunting the musk-ox, for it is a slaughter, or what the Norwegian hunters call a butchering."<sup>102</sup>

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<sup>100</sup>Richard Perry, *The Polar Worlds*, (New York, 1973), pp. 272-273.

<sup>101</sup>*Ibid.*, pp. 273-274.

<sup>102</sup>Alwin Pedersen, *Polar Annuals*, (New York, 1966), pp. 45-46.

Yet Paul Martin and those that advocate the hunting hypothesis say only those animals that were innocent of human hunters were exterminated by ancient man. The musk-ox is most definitely innocent of human hunters, but was never hunted to extinction. Once again, the concepts underlying the hunting hypothesis fail to explain the evidence, and this evidence must be completely ignored in order to make this suggestion. As Kurten remarks,

"It is noteworthy that . . . the . . . musk-ox . . . —were able to maintain themselves, perhaps because of their long previous conditioning to man."<sup>103</sup>  
[What is Kurten talking about?]

Therefore, in order for ancient hunters to obtain meat from musk oxen, they had to kill off each herd they preyed upon to the last one. The obvious question is, why didn't these ancient hunters hunt the musk oxen to extinction as they did to so many other innocent species? It is utter folly to suggest that these hunters extirpated a host of other innocent genera but then failed to do the same with the innocent animal that would have provided him with a great deal of meat with little expenditure of effort.

But, what is also incongruous with this line of argumentation is that while the musk ox survived the overkill in North America, "[i]n Europe . . . [m]edium-sized ungulates disappeared including . . . the musk ox, *Ovibos*, [according to Owen-Smith which] . . . survives in North America. . . ."<sup>104</sup> Why did the hunters in Europe exterminate to the last one the musk ox, while those in America failed to do the same? But on the reverse side of the coin, in the Americas a horse-like animal, the *saiga*, was killed off but "Saiga . . . still occurs in temperate Asia."<sup>105</sup> This makes no sense at all. What we have are two types of medium-sized ungulates—musk ox, *Saiga*, being driven to extinction on one continent by hunters but not being driven to extinction on another continent by hunters.

Even on the same continent, we also run into this problem again, as pointed to by Owen-Smith:

". . . ungulate species becoming extinct in southern Africa [at the end of the Pleistocene] . . . included the giant cape horse . . . and two species of

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<sup>103</sup>Kurten, *The Age of Mammals*, (New York, 1972), p. 221.

<sup>104</sup>Owen-Smith, *Megaherbivores*, (Cambridge, Eng., 1992), p. 281.

<sup>105</sup>*Ibid.*

springbok . . . but [they] persisted in the Saharan region until about 4,000 years ago."<sup>106</sup>

Why did the African hunters kill off these three animals 12,000 to 9,500 years ago in Southern Africa, but waited for about 4,500 years to finish them off in the Sahara? Again, this makes no sense in terms of the overkill hypothesis. In the Americas, we find the very same thing—the North American camel was a llama-like animal. While the big-game hunters in North America supposedly annihilated it when they arrived in South America, they failed to kill off the camel's cousin, the llama.<sup>107</sup>

The most fundamental problem in this regard has to do with the Asian elephant, *Elephas*. As Haynes points out that, "species present us many different types of paleoecological problems, such as finding a satisfactory explanation for the disappearance of *Elephas* from Africa but not from Asia."<sup>108</sup> Why did ancient man exterminate one type of elephant in Africa; namely *Elephas* but fail to do the same with its cousin, the African elephant, *Loxodonta*? Here in a nutshell is a massive contradiction to the hunting hypothesis. It presumes elephants were killed off by humans over the various continents. But on one continent, Africa, one type was exterminated, while in Asia a close relative of that elephant was not extirpated at all.

But even if we accept the Clovis Police's 12,000 year time restraint, can we also assume that sparse populations of human beings armed only with crude stone weapons were able to drive to extinction the megafauna both in North and South America and the rest of the Earth?

Elephant hunting techniques of the past "by our early ancestors [of] . . . the mammoth, and mastodon, and the elephant can never be exactly known, but they probably resembled those of the primitive elephant hunting tribes of the recent past."<sup>109</sup> Richard Carrington, a naturalist, has outlined the various methods by which primitive men in our recent past hunted elephants. But there is absolutely no evidence that proves ancient man used these methods. The entire overkill theory is based on the assumption that these more modern hunting techniques were used in prehistoric times.

"The simplest and most effective of all elephant hunting methods, widely used in Africa until recent times, is the pitfall. . . . A pit with smooth sloping sides is dug across a path frequented by the quarry, and covered with branches and a layer of earth. One of the favourite places is at the approaches to a river,

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<sup>106</sup>*Ibid.*, p. 282.

<sup>107</sup>Frank C. Hibben, *Digging Up America*, (New York, 1960) in Terrell, *American Indian Almanac*, *op. cit.*, p. 446.

<sup>108</sup>Haynes, *Mammoths, Mastodonts & Elephants*, *op. cit.*, p. 264.

<sup>109</sup>Richard Carrington, *Elephants*, (New York, 1959), p. 143.

for elephants must drink each day, and there are often well-defined tracts leading to their watering-places."<sup>110</sup>

Sometimes the pit will contain impaling stakes pointing upward. The hunters approached when an elephant was trapped and speared it to death. This technique was described by Pliny almost 2,000 years ago in his *Natural History*, Book VIII, Chapter 8. "In Africa they take them in pit-falls; but as soon as an elephant gets into one, the others immediately collect boughs of trees and pile up heaps of earth, so as to form a mound [beneath their captured companion] and then endeavor with all their might to drag it out."<sup>111</sup>

This technique, or any other accounting for single kills, could hardly explain the destruction of so many millions of mammoths and mastodons and other large mammals. Probably the most destructive methods of hunting elephants is setting fire to the vegetation in a circle surrounding them. This method was used throughout Africa in the past and was "responsible for the deaths of many hundreds or even thousands of elephants each year."<sup>112</sup> According to Sir Samuel Baker, writing in 1890:

"During the dry season, when the withered herbage from 10 to 14 feet in height is most inflammable, a large herd of elephants may be found in the middle of such high grass that they can only be perceived should a person be looking down from some elevated point. If they should be espied by some native hunter, he would immediately give due notice to the neighbourhood, and in a short time the whole population would assemble for the hunt. This would be arranged by forming a circle of perhaps 2 miles in diameter, and simultaneously firing the grass so as to create a ring of flames around the center. An elephant is naturally afraid of fire, and it has an instinctive horror of the crackling of flames when the grass has been ignited. As the circle of fire contracts in approaching the encircled herd, they at first attempt retreat until they become assured of their hopeless position; they at length become desperate, being maddened by fear, and panic-stricken by the wild shouts of the thousands who have surrounded them. At length, half-suffocated by the dense smoke, and terrified by the close approach of the roaring flames, the unfortunate animals charge recklessly through the fire, burnt and blinded, to be ruthlessly speared by the bloodthirsty crowd awaiting this last stampede. Sometimes a hundred or more elephants are simultaneously destroyed in this wholesale slaughter."<sup>113</sup>

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<sup>110</sup>*Ibid.*

<sup>111</sup>*Ibid.*, p. 144.

<sup>112</sup>*Ibid.*, p. 146.

<sup>113</sup>Samuel White Baker, *Wild Beasts and their Ways: reminiscences of Europe, Asia, Africa and America*, Vol. I, (London, 1890), pp. 100-101.

If this method works so well, one must ask why didn't the Africans kill off the elephant? Therefore, to kill off hundreds of elephants, there must be extremely dry vegetation, which would exist predominantly in the autumn and a large population, "thousands," to set a large circular fire, but even more importantly the population must be quite large to spare large numbers of elephants. A most important point in this regard is that Africans have large, heavy iron-headed spears honed to razor sharpness. Even with a sharp cutting edge and the weight of such a stone spear could hardly be expected to do much damage to the thick hide of a mammoth.

As Willy Ley explains:

"Anthropologists have often tried to give helpful hints to paleontologists by pointing out the methods of hunting used by primitive tribes in comparatively recent times. They have told how natives use brush fires to stampede animals in a certain direction so they are forced to jump down steep cliffs. They have told how natives, armed with several spears per man, isolate a single animal from the herd, corner it, and then dispatch it either by means of thrown spears or by using spears as close range weapons.

"Such hints are helpful, but whether or not they are applicable is another question. The so-called fire drive requires not only fire (and a suitable locality), but also large numbers of hunters. The anthropologists who told about such hunts stressed that hundreds and sometimes even thousands of natives took part in them, with enough yield for every hunter and his family. But primitive man . . . [especially in the Americas] was not numerous enough to conduct such hunts."<sup>114</sup>

With respect to the size of the population of Eurasia, Carrington states that "the total number of human beings in the whole of Eurasia during the Ice Age was probably less than the number living today in any large industrial city."<sup>115</sup> He adds, that although the mammoth was probably regarded as a most desirable prize, it was not his main quarry. Horses, reindeer, wild cattle and antelopes [sic] were also successfully hunted, and by comparison the inroad made by man on the vast mammoth population must have been almost negligible."<sup>116</sup>

J. Wood, as long ago as 1868, showed that even when iron-tipped spears were hurled at elephants, it almost never passed through the thick skin to penetrate to the

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<sup>114</sup>Willy Ley, *Dragons in Amber*, (New York, 1951), pp. 117-118.

<sup>115</sup>Richard Carrington, *Mermaids and Mastodons*, (London, 1961), p. 120.

<sup>116</sup>*Ibid.*

organs. Under these conditions, the elephant would run away with the native hunters in pursuit.<sup>117</sup> But according to Haynes, "wounded elephants can run for miles."<sup>118</sup>

On the other hand, Ley points out:

"The skin of the elephant, while thick, has soft spots. So presumably, did the skin of the mammoth. But the long hair protected those softer areas. Before a spear could touch the inch-thick skin it had to penetrate some 8 inches of wool. And under the skin there were some 6 inches of fat. A high-powered rifle bullet would be needed to get through all this to the vital organs. No spear could ever do it; no man could put enough driving force behind it."<sup>119</sup>

The reason a high powered bullet can penetrate more deeply into an elephant than a spear is the speed of the bullet as compared to the speed of the spear, because the momentum of the bullet is greater compared to that of the spear, and finally the breadth or diameter of the bullet compared to that of a spear. Although a bullet has far less mass than a thrown lance, its velocity more than makes up for that of the lance. However, the diameter of the spear requires that it encounter and move aside or crush much more flesh than the bullet to penetrate deeply into an elephant.

What is needed, in any case, is a large number of hunters and a great many spears. The number of hunters was quite limited, and 10,000 years ago man did not have iron, nor had he domesticated horses to pursue mammoths that ran for long distances to escape the attacks.

As pointed out by Derek Wilson in his fine book on elephant hunting, regarding the use of rifles and horses,

"This indiscriminate and haphazard method of slaughter [of elephants] was characteristic of many of the early hunters. They knew little of elephant anatomy and even had they known, their guns would seldom have been equal to the task of bringing down an animal with a single well-placed shot. Their circumstances dictated their techniques. They had to hunt on horseback in order to keep up with their quarry, peppering it with repeated wounding shots until it dropped from exhaustion or loss of blood. Gordon Cumming [a hunter] once expended fifty-seven bullets in dispatching one large bull."<sup>120</sup>

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<sup>117</sup>J. Wood, *The Natural History of Man, Being an Account of the Manners and Customs of the Uncivilized Races of Men, Vol. 1: Africa*, (London, 1868), pp. 134-138.

<sup>118</sup>Haynes, *Mammoths*, *op. cit.*, p. 298.

<sup>119</sup>Ley, *Dragons in Amber*, *op. cit.*, p. 120.

<sup>120</sup>Derek Wilson, Peter Ayerst, *White Gold*, (New York, 1976), pp. 43-44.

Needless to say, small tribal groups, armed with stone weapons, who did not have horses to ride, as in Pleistocene Eurasia or America, would not have been capable of killing very many mammoths or mastodons. The charging elephants would have killed many of the hunters and most would have escaped.

To overcome this population problem, C. Vance Haynes created the following scenario in 1966. He began with one tribe of 30 mammoth hunters and claimed that in 500 to 1,000 years they would increase first to 800 and then to 12,500 people, or from 26 tribes to 425. Haynes then extrapolated on the concept of Clovis hunters arriving 12,000 to 13,000 years ago, that in the second 500 year period they could have shaped as many as 14 million spearheads found all across North America.<sup>121</sup>

But, the fact of the matter is that no one can say with any degree of certainty how large the Amerindian population would increase in 500 to 1000 years. This is, once again, plausibility elevated to the level of fact. On the other hand, Haynes' assessment of the millions of spearheads in North America can also be accounted for by the evidence that man was in the Americas for at least the past 30,000 years. He would then have had more than sufficient time to shape these millions of hunting artifacts.

One of the problems related to this is that diseases such as pneumonia, tuberculosis, or local catastrophes, or other conditions as they always have, would annihilate entire or almost entire tribes, and keep the population in check. In Africa with its abundant game, the population did not grow to vast numbers over the past. Whenever primitive groups were found, their populations were not immense.

The point, however, is that in Africa, where elephants have been hunted by large populations by all these methods from time immemorial, elephants thrived right up until the present century. And it is only with high powered rifles that the herds have been reduced to small numbers. Africans are very wary of stalking these beasts because they are extremely dangerous and less dangerous animals are safer to hunt. But even under present conditions, it is extremely difficult to kill even wild kudus, a deer, with firearms.

As Brian M. Fagan shows:

"[Stuart] Marks went out on a hunt, watching the hunter stalking kudu and other prey for hours, examining fresh droppings, testing the wind direction, studying the composition of the herd. The pursuer would move forward quietly, freeze when the herd looked up, then shift position again until he was close enough to fire. Seven out of ten times he missed, and the entire chase began again. And if a hit was scored, the animal almost never died outright. It could be hours or even days, before the hunter could catch up with his quarry and kill it.

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<sup>121</sup>C. Vance Haynes, "Elephant Hunting in North America," *Scientific American*, Vol. 214, (June 1966).

In many cases, the wounded animal escaped or was killed and eaten by lions before the hunter arrived."<sup>122</sup>

There were many animals such as horses, antelope, etc., that became extinct in North America after the Ice Age. Again, if the African hunters, even with firearms, could not exterminate them, how could small populations have done so with crude stone-headed spears, or other primitive weapons?

Fagan goes on to show that at the finds of man's settlements, "archaeologists have always been struck by the abundance of reindeer bones at Cro-Magnon sites. Judging from the bones at the Abri Pataud rockshelter, reindeer provided up to thirty percent of all prey there over a period of more than 10,000 years."<sup>123</sup> And what about American bison? This had to have been the main staple of plains Indians very soon after they supposedly wiped out all the other animals. Yet [Kurten concludes] "the bison is still with us."<sup>124</sup> According to Pielou,

"Plano people lived after the great wave of extinctions at the end of the Pleistocene. Bison had now become the chief quarry in the Great Plains. . . .

"Bison hunters probably used driving as their chief hunting method [without horses?!]. The reason for believing this is that most of the Paleo-Indian archaeological sites containing animal remains (mostly bison bones, horns, and teeth) contain them in abundance; the sites are 'mass kill' sites. The hunters presumably drove large herds of bison into natural impoundments such as narrow canyons or into specially constructed corrals, where they could be slaughtered. In other places, the animals were killed or disabled by being driven over buffalo jumps."<sup>125</sup>

To make matters worse, one of the species supposedly driven to extinction was an "extinct species of bison."<sup>126</sup> The question is, of course, why did hunters destroy every last one of the extinct species of bison, but then forget to do the same with the modern bison?

Another method would be to stampede a herd of elephants off a cliff. This, too, would destroy a great number of elephants at one time. But how many cliffs are

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<sup>122</sup>Brian Fagan, *The Journey From Eden*, (New York, 1990), p. 44.

<sup>123</sup>*Ibid.*, p. 152.

<sup>124</sup>Kurten, *Before the Indians*, *op. cit.*, p. 141.

<sup>125</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 289; see also, Brian Fagan, *Time Detectives*, (New York, 1995), pp. 58-74.

<sup>126</sup>*Ibid.*, p. 259.

available in any region and how many elephants will just happen to come to these entrapment areas? Most regions have very few high, steep cliffs to kill off all these beasts, and this requires that they come to these areas or be driven to them from distant places, which is highly improbable.

Ley explains:

"But it is now accepted that in the specific case of the Predmost [Czechoslovakian] mammoths primitive man actually had stuffed himself with the flesh of dead animals. No doubt he could kill 600 mammoths in time. But he could not have dragged the heavy bodies to the same place, and if he made a mammoth trap of some kind near Predmost, the animals would not have patiently walked into the same trap year after year. Obviously, something, probably a blizzard of unusual severity, had killed the mammoths there. Only a natural catastrophe can account for the presence of 600 mammoths in one place.<sup>127</sup>

What Ley is arguing is that local catastrophes more clearly explain the few large sites where large numbers of mammoths and human artifacts associated with their remains are found. Velikovsky and his supporters do not reject local catastrophic finds. They certainly could have occurred on rare occasions in a very few places. But those of us who do support Velikovsky strongly deny that the herds of the arctic and elsewhere filled to bursting with torn and twisted beasts and trees are of a completely different and global catastrophic character.

The point that must be made in this respect is that in the Americas ancient man is assumed to have entered the continent about 12,000 years ago and in about 1,000 years to have slaughtered not only all the mammoths and mastodons in North America, in Central and South America, but also horses, camels, giant peccaries, mountain deer, giant beavers, four pronged antelopes, ground sloths, dire wolves, native lions, and giant short-faced bears, as well.

However, there is another continent on which this concept can be tested. "Only twice in human history were entire continents, Australia and America, colonized suddenly."<sup>128</sup> Therefore, it would be possible to date man-the-hunter arriving in Australia and the onset and end of the great extinction. According to Martin "Ample evidence of human presence in Australia exists back to 30,000 years go."<sup>129</sup> If man in Australia operated in a similar fashion as man in America, then it is expected that within a thousand years the megafauna there would have been hunted to extinction. He goes on to admit, "The [overkill] model can be rejected in Australia if a 'late' extinction chronology

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<sup>127</sup>Ley, *Dragons in Amber*, *op. cit.*, pp. 121-122.

<sup>128</sup>Paul Martin, "Prehistoric Overkill," *Quaternary Extinctions*, P. S. Martin, R. G. Klein eds., (Tucson, Ariz., 1989), p. 378.

<sup>129</sup>*Ibid.*, p. 379.

proves valid, that is, if the extinct mammals are found to have maintained sizable populations long after initial human invasion of the continent."<sup>130</sup>

However, Sutcliffe answers this statement by pointing out:

"In Australia it is now believed that man had already arrived in New South Wales by 33,000 years ago. Yet some of the large kangaroos which later became extinct were still flourishing many thousand years later. If Pleistocene man was responsible for this disappearance then this was a very lengthy process; not the sudden extermination that the hunting hypothesis would suggest."<sup>131</sup>

Specifically, Martin cannot, or will not, accept the evidence of D. R. Horton who carefully traced the Red Kangaroo to have survived to about 15,000 years before the present. That means that in Australia where there were few animals dangerous to man, it took supposedly 15,000 years after human arrival to hunt this giant to extinction. As Horton justly points out, "Not surprisingly the time of man's arrival in Australia 40,000 B.P. or earlier bears no relationship to the timing of the extinction."<sup>132</sup> Of course, Martin disputes the accuracy of these dates or adjusts the speed of the killing.

But again, as in the Americas, other dating techniques indicate man was in Australia even earlier than 30,000 or 40,000 years ago. As James Shreeve points out:

"According to the latest thermoluminescence dates, New Guinea and Australia were first colonized 60,000 years ago, when they were still joined to the greater continent of Sahul."<sup>133</sup>

But, as with evidence from the Americas, these dates are also contested by the overkill advocates. R. Gillespie, *et al.*, in 1978, pointed out:

"Excavations into the Australian swamp of Lancefield show that a bone bed dated at 26,000 years ago contains perhaps 10,000 giant extinct animals. Associated artifacts suggest that humans were in the area, but the direct cause of death of the animals is, on present evidence not explicable. Such a recent date for the classic megafauna shows that it was living together with humans for at

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<sup>130</sup>*Ibid.*

<sup>131</sup>Sutcliffe, *On the Track of Ice Age Mammals*, (Cambridge, Mass., 1985), p. 201-202.

<sup>132</sup>D. R. Horton, "Red Kangaroos: Last of the Australian Megafauna," *Quaternary Extinction*, P. S. Martin, R. G. Klein, eds., (Tucson, Ariz., 1989), p. 678.

<sup>133</sup>James Shreeve, *The Neandertal Enigma*, *op. cit.*, p. 255; see also, B. Bower, "Australian site yields early human dates," *Science News*, vol. 137, (May 12, 1990), p. 137.

least 7,000 years in southeast Australia. This enduring association argues against a catastrophic and rapid overkill in the Australian Pleistocene."<sup>134</sup>

According to Flannery:

"Professor Richard Wright of Sidney University, excavated a site at Tanbar Springs on the Liverpool Plains of central eastern New South Wales [Australia]. There he found buried in mud which accumulated around the springs, small bone fragments of giant marsupials and tools made by Aboriginal people that were deposited over a time span of many thousands of years. Indeed, bone fragments from giant marsupials occur in deposits as recent as 6,000 years ago. On this basis, Wright has suggested that giant marsupials and humans coexisted on the Liverpool Plains for a very long time. . . ."<sup>135</sup>

Again, all this evidence is questioned or denied by the overkill advocates. Nevertheless, Stephen M. Stanley explains, with respect to overkill in Australia, that the

". . . overkill idea has been attacked with the claim that archeological evidence fails to demonstrate that the ancient Australian aborigines were any more effective as big game hunters than their living descendants who do not pursue large prey effectively in large well-armed groups."<sup>136</sup>

Just like the paleo-Indians of America who forgot how to exterminate the buffalo, though they supposedly did in its ancient form, the Australian aborigines also forgot the fine art of extermination after killing off the earlier kangaroos. "Australia" has "no kill sites" [Ward, p. 154].

What is most interesting regarding this matter is that one of the major arguments that certain animals were not hunted to extinction in the Americas is that they were aware of man and his methods of killing. Martin has argued that those genera that were overkilled were naive and did not take evasive actions when attacked. But in Australia, none of the large animals were experienced with humans and had not developed the instincts for survival, therefore, they should have all been driven to extinction. Diamond states that, "Australian . . . animals had evolved for millions of years in the absence of

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<sup>134</sup>R. Gillespie, *et al.*, "Lancefield Swamp and the Extinction of the Australian Megafauna," *Science*, Vol. 200, (1978), p. 1044.

<sup>135</sup>Flannery, *The Future Eaters*, *op. cit.*, p. 200.

<sup>136</sup>Stephen M. Stanley, *Extinction*, (New York, 1987), p. 206.

human hunters."<sup>137</sup> What we constantly encounter with the blitzkrieg overkill theory is that the rationalizations which are applied in one region under one condition do not apply to another region under the same or similar conditions.

However, there is another way to ultimately test the hunting hypothesis, and that has to do with the extinction of elephants in the Near East during historical times. If it can be shown that elephant hunting was ongoing during this early period of human civilization and that a large population using iron, bronze, horses, and every method possible (from its more advanced status) to kill off the herds which ranged over these lands, took about a thousand years or more to remove the elephants, then it becomes extraordinarily difficult to accept that far less advanced hunters in North and South America took 1,000 years to kill off all the megafauna, and not only elephants, over both continents which are dozens of times larger in area than the Near East. How can it be possible for a small population of primitive man to do in 1,000 years over two immense continents what it took a more advanced, large population to do in over 1,000 or 2,000 years over a much smaller region by comparison?

Leonard Krishtalka discusses the time component for ancient man to exterminate the American megafauna.

"Martin's hypothesis is straightforward overkill. Moving at no more than about twenty miles a year, a rapidly spreading front of Ice Age human hunters slaughtered, butchered and exterminated the big animals of the Americas, beginning in northern Canada about 11,500 years ago and finishing the job in Patagonia 1,000 years later."<sup>138</sup>

Therefore, one would expect to find that as the hunters swept from North America down to South America, they exterminated all the unfortunate or unlucky animals in their path and the extinction should exhibit a clear and unambiguous trail. But, according to Owen-Smith, the

". . . dates of mammoth fossils in North America do not support Martin's notion of a blitzkrieg wave rolling southwards. . . . A further challenge comes from reported dates of human presence and hunting of large mammals in South America, predating the Clovis period on North America."<sup>139</sup>

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<sup>137</sup>Jared Diamond, *Guns, Gems, and Steel*, (New York, 1997), p. 42.

<sup>138</sup>Leonard Krishtalka, *Dinosaur Plots & Other Intrigues in Natural History*, (New York, 1989), p. 206.

<sup>139</sup>R. N. Owen-Smith, *Megaherbivores*, *op. cit.*, p. 291.

This is fully corroborated by the work of Michael Beck who analyzed Martin's overkill hypothesis based strictly on the most secure data from Carbon-14. He claimed no such pattern of kills moving as a wave from North America to Patagonia existed as cited by Ward.

"No matter how the data are analyzed the geographic distribution of the terminal Wisconsin does not support the Blitzkrieg hypothesis. In fact, all the patterns in the data are in opposition to the pattern predicted by the Blitzkrieg hypothesis and there is no obvious bias in the data that could create these results."<sup>140</sup>

By looking at all the dated species, Beck found that throughout the Americas there were species south that became extinct earlier compared to others to the north. No matter how he manipulated the data, this finding always came out of the analysis.

That is, if we accept the timing based on various dating methods employed by the investigators, there were areas in the Americas where the fauna became extinct earlier farther south of areas where others later became extinct farther north. But, let us return to the test of the overkill hypothesis.

Professor H. H. Scullard's *The Elephant in the Greek and Roman World*, (1974), gives a full account of this period. This material was carefully summarized by Derek Wilson and Peter Ayerst in *White Gold*.

"All the great civilizations of Asia and Europe prized elephant ivory. combs, knife handles, carved figures and other items revealing a high degree of skill have been found in predynastic (e.g., before c. 3,000 B.C.) Egyptian sites and there were ivory carving centres in Babylon at the same time. The large numbers of ivory objects found in royal tombs indicate beyond doubt that articles made from elephant tusks were status symbols eagerly coveted by the wealthy. Stylistic similarities suggest that much of the carving was done by itinerant craftsmen, probably Phoenicians. Certainly ivory was an important trading commodity for the merchants of Tyre and Sidon. . . .

"When King Solomon was building the temple at Jerusalem (c. 1,000 B.C.) he had such a need for ivory and precious metals to adorn the great edifice that he entered into a special commercial treaty with King Hiram of Tyre, as we read in I Kings X, 22-23,

‘For the King had at sea a navy of Tharshish with the navy of Hiram: once in three years came the navy of Tharshish bringing gold and silver, ivory, and apes, and peacocks.

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<sup>140</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 163; see M. Beck, "On discerning the cause of late Pleistocene megafaunal extinction," *Paleobiology*, Vol. 22, (1996), pp. 91-103.

‘So King Solomon exceeded all the kings of the earth for riches and for wisdom.’

"Further evidence of his wealth was Solomon's ivory throne which, we are told, ‘had six steps, and at the back of the throne was a calf's head, and on each side of the seat were arm rests and two lions standing beside the arm rests, while twelve lions stood there, one on each end of a step on the six steps.’ The whole thing was overlaid with gold and ‘the like of it was never made in any kingdom.’ Not to be outdone, a later King, Ahab, constructed a palace, so heavily ornamented with ivory that it was called the ivory house. Ivory came to be synonymous with luxury and decadence in the Hebrew kingdom and as such was denounced by the eighth century prophet, Amos:

‘Woe to those who lie upon beds of ivory. . . .’

"Ivory featured prominently in what was probably the most culturally advanced early Mediterranean civilization—Minoan Crete. At the palace of Zacro, which is known to have been destroyed by 1,450 B.C., archeologists found four elephant tusks. At Kronos an ivory carver's workshop was unearthed in which there were still many traces of large statuettes and cylindrical caskets carved in relief. It was probably here that the technique later made famous by great Greek sculptors such as Phidias, were perfected by facing large statues with plates of ivory, pinned together, and decorated with gold leaf. . . .

"Rome—powerful acquisitive Rome—consumed ivory in great quantities. . . ." <sup>141</sup>

Therefore, for 3,000 or so years, based on the established chronology, the ancient Near East and Classical Europe were using ivory in large amounts. The elephants that supplied this commodity, therefore, had to be hunted for their precious tusks. And since there was great profit to be gained from this white gold, the incentive to kill elephants in the surrounding regions was strong. Wilson goes on.

"Where, then, did all this ivory come from? There were three main areas of supply; India, Syria, and North Africa (including Egypt). . . . Two source areas of African [type] elephants were left throughout classical times; Ethiopia and the northern Sudan (and to some extent Somalia), and the Maghreb. . . . For hundreds of years ivory found its way down the commercial highway of the Nile to Thebes and Memphis. Occasionally, expeditions were dispatched southward in search of tusks. . . .

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<sup>141</sup>Derek Wilson, Peter Ayerst, *White Gold*, *op. cit.*, pp. 19-21.

"But the south could not produce enough ivory to meet Egypt's needs. The great rulers of the New Kingdom, Thutmose I and Thutmose III invaded Syria, and one of their reasons for this extension of empire was their desire to secure a supply of ivory from the Syrian herds. . . .

"The Syrian elephants . . . had provided most of the tusks for the craftsmen of Phoenicia, Babylon and Assyria. They bore the brunt of the quest for ivory throughout much of the ancient period. As well as professional hunters, kings went on elephant *battues*. . . . Ivory figured prominently in the tribute paid by vassal states to their overlords and in the booty obtained from defeated capitals. The uncontrolled activities of the hunters gradually and inevitably thinned out the Syrian herds. By 500 B.C. there were no wild elephants left in the Middle East."<sup>142</sup>

Thus, the Near East elephant herds took about 2,000 years to be driven to extinction, if we date high ancient Near East civilization to 2,500 B.C. But even if we bring early civilization down by a thousand years to 1,500 B.C., it still took those advanced societies a thousand years to drive these herds to extinction in only that small corner of the world, compared to all of North and South America. Since this was a commercial enterprise, these men hunted in groups nearly every day, year in and year out, with iron or bronze weapons, with horses and perhaps chariots, perhaps with bows and arrows, and all the methods used by primitive men. The size of the hunting parties was probably large and kept the ancient world supplied for 1,000 to 2,000 years with ivory. To suggest it took about as long or longer for commercial hunters to exterminate the elephants in Syria and thereabouts as it took American neolithic man to exterminate the elephants across two large continents is simply not credible. The extinction in the Americas, in so short a period of time, could never have occurred on the basis of such methods. The American buffalo were so numerous in the early 1800's that herds covered the prairies. Why did ancient men somehow forget to eradicate these large beasts by circles of fire, driving them off cliffs and all the methods they had employed for the mammoth, mastodon, and all the others that they are supposed to have driven to extinction? Again, the idea is not credible. Why would the small population in the Americas kill off all these creatures while the larger populations of Africa and India failed to do the same? Larger populations require more, not less killing to fulfill their dietary needs.

To put this into greater perspective, all one need do is to realize that elephants also lived in Southern China while mammoths lived in northern China during the Pleistocene. According to Sanderson,

"About forty years ago some scholars, engaged in deciphering and interpreting certain very early Chinese texts, believed they had discovered statements indicating that wild rhinoceroses and elephants were still alive in

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<sup>142</sup>*Ibid.*, pp. 22-23.

northern China until historical times. . . . [H. T.] Chang, in 1926, delved further into these matters. He found that although Abu [elephants] seemed to have disappeared from *northern* China before the Neolithic or late Stone age, they continued to exist in the south.

"Chinese writing, or ideography, has gone through a prolonged development starting with naturalistic hieroglyphs and ending with the various highly artistic forms of script used today."<sup>143</sup>

Now, according to David Raup, "The woolly mammoth died out about 18,000 years B.P. (years before present) in China, . . ." <sup>144</sup> If this is so, then while the woolly mammoth became extinct in northern China, the Asiatic elephant continued to survive in southern China and India where the population was much larger. If few hunters could exterminate the mammoth in China 18,000 years ago, why didn't more advanced hunters exterminate the elephant in China and India at the same time? The same consideration must also apply to any other theory of extinction. Again, it is illogical to suggest that man killed off the mammoths, but failed to do the same to the elephants in China and India. This is the same problem discussed above regarding *Elephas*, which was killed off in Africa but not in Asia.

Killing and butchering elephants on a site would leave telltale evidence of what had occurred. But Gary Haynes explains at the kill sites with Clovis points,

"The Clovis samples [at kill sites] clearly are different in many ways from modern elephant bone assemblages, but they are also similar in other ways. Their greatest similarities are to modern noncultural bone assemblages [bones not left by hunting groups]. They simply do not look like examples of butchered elephants. . . .

"Modern ethnographic studies have never documented elephants being slain at water holes. Modern sites are located in the bush, too far from water for burial by alluvial or lacustrine sediments. [Yet] Every Clovis mammoth seems to have died at a water source."<sup>145</sup> [Hunters would rarely leave useful spearpoints behind.]

Colin Tudge, in discussing Haynes' research points out:

"In North America, where continental overkill seems least equivocal, direct signs of human attacks have been found at five sites. However, while

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<sup>143</sup>Sanderson, *The Dynasty of Abu*, (New York, 1962), pp. 103-104.

<sup>144</sup>David M. Raup, *Extinction*, *op. cit.*, p. 89.

<sup>145</sup>Gary Haynes, *Mammoths, Mastodon's & Elephants*, *op. cit.*, p. 312.

some of these signs . . . do give pretty convincing evidence of human involvement, other alleged evidence now seems somewhat shaky. For example, crushed mammoth bones, from young animals, have been found, with peculiar scarring and spiral fractures, for all the world suggesting butchery, with a bias toward the most amenable prey [the young]. But archeologist Gary Haynes has studied piles of elephant bones in Zimbabwe that resulted from deaths caused by drought in the early 1980's. At that time, the animals gathered around the dwindling water holes, and as their desperation grew, the social structure broke down and the smallest animals, normally cosseted, were pushed to one side and were the first to die. Then the frantic animals trod on their fellows' corpses, producing precisely the kinds of marks and breaks that have been seen in North American mammoth heaps."<sup>146</sup>

Therefore, the evidence of the kill sites that were simply assumed to be identified by the conditions of the shattered bones, and the young age of the prey, has simply vanished once the correct tools were used to examine it. This is corroborated by Kathy D. Schick and Nicholas Toth who further point out,

"Scratches, can also be produced on bones as they lay on the ground, trampled by animals or worked by churning sands as floods swept over the site. As animals may carry sharp bits of rocks adhering to their hooves (angular sand grains and such), trampling can produce marks on bones that mimic cut marks from stone tools. Paleontologist Kay Behrensmeyer from the Smithsonian Institution and Peter Andrews from the British Museum of Natural History have each shown that such marks can occur on modern bones in natural nonhuman settings and may be microscopically indistinguishable from shallow cut marks from stone tools."<sup>147</sup>

Thus, there is no definitive way of knowing if a bone associated with a spear point which has incised marks came from an animal that was killed and butchered by ancient man, or was the result of hoof marks. Spear points are found by the millions all over the Americas and elsewhere. It is just as plausible that the very few kill sites that are identified in America, in terms of the overkill theory, are merely the coincidence of an animal dying from disease or some accident and expiring in an area where a spear point happened to be lying on or near the surface. The approximately dozen such sites found are a reasonable expectation in terms of this evidence. If, indeed, there were thousands or hundreds of kill sites, there would be no question that this number was the unmistakable work of man. The fact that there are so very, very few sites clearly favors these nonhuman incisings of mammoth bones. Therefore, what had earlier been accepted as proofs of human hunting simply vanishes.

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<sup>146</sup>Colin Tudge, *The Time Before History*, (New York, 1996), pp. 303-304.

<sup>147</sup>Kathy D. Schick, Nicholas Toth, *Making Silent Stones Speak*, (New York, 1993), p. 180.

One further point worth mentioning has to do with where these supposed kill sites do not occur. According to Lewin,

"Although several good Clovis quarry and tool making sites have been discovered east of the Mississippi, big game hunting sites are almost completely absent there. What this means still puzzles archaeologists, but it does emphasize the fact that the popular—and cogent image of the Clovis people is based on a small part of a *probably biased record*."<sup>148</sup> (Emphasis added)

It is on evidence of a probably biased record, then, that the entire record and evidence for the overkill theory rests.

A point that must be emphasized has to do with the diet of ancient man. The question is: was man primarily a meat eater or did much of his diet consist of vegetation? This creates a problem.

Evidence presented by Ann Roosevelt in Brazil and at Monte Verde in Chile showed man's diet was not primarily based on the meat of large animals. According to Shipman:

"Modern human populations vary widely in both the importance of meat in their diet and in the 'normal' caloric and protein intake . . . . Because vegetable remains are extremely prone to decay, it is exceptionally difficult to estimate the quantity and identity of non-meat resources exploited by a population. As has been shown by Coe and Flannery . . . there may be a substantial difference between the resources available to a population and those actually utilized. THERE IS AT PRESENT NO MEANS OF REDUCING OR EVEN ASSESSING ERRORS IN MEASURING VARIABILITY IN DIET."<sup>149</sup> (Capitalization added)

Haynes specifically points out:

"Archeological evidence indicates that all known culture complexes appear to have specialized in reindeer . . . , horse . . . , bison . . . , or, in many cases, smaller game. According to faunal counts and intersite comparisons . . . mammoth utilization by humans in far northern Eurasia appears to have been

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<sup>148</sup>Lewin, *In the Age of Mankind*, *op. cit.*, p. 164.

<sup>149</sup>Pat Shipman, *Life History of a Fossil An Introduction to Taphonomy and Paleoecology*, (Cambridge, Mass., 1981), p. 125. See Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 149, regarding protein poisoning.

situationally opportunistic, not indicative of habitual preference for mammoth. The very few mammoth-dominated site assemblages may represent no more than human use of noncultural [not hunted mammoth] deaths."<sup>150</sup>

According to Cynthia Irwin, *et al.*, "But seldom in history—perhaps less than a dozen times—had scientists excavated evidence of man and mammoth together in North America."<sup>151</sup> With such meager evidence for overkill, it is extremely difficult to accept that such few questionable kill sites can be extrapolated to a literal extinction episode.

Then, as Hadingham points out, "small-sized bones are much more vulnerable to processes of weathering [decay] and decomposition, so . . . the archaeologist might receive a false impression of the importance of big animals [in the diet]. . . . A more crucial problem is the difficulty of estimating the importance of vegetables in the diet. Unless there were quite exceptional conditions of preservation on the site, no traces of these would be recovered. . . ."<sup>152</sup> Then there is the question: Did early man hunt the animal found with his stone tools, or was the animal already dead or near dead and man merely scavenged this find? With the very few sites found, the probability that man was a scavenger rather than a hunter of dangerous megafauna, becomes more plausible.

Therefore, the overkill hypothesis is based on a large assumption regarding ancient man's diet which, to this day, has never been conclusively proven with respect to how much meat he utilized in his diet as compared with vegetation. With such an outstanding problem, it becomes more and more difficult to suggest that even the foundation of the hypothesis has any validity.

Furthermore, Krishtalka shows:

"For example, mammoths were especially vulnerable to overkill. They were herd animals, easy to slaughter in large numbers. . . . The American mastodont, on the other hand, would not have been susceptible to overkill. Individuals appear to have roamed singly rather than in herds, and lived almost exclusively in dense spruce forests, an environment unsuited for mass killing prey."<sup>153</sup>

But in fact, not only were mastodonts forest animals, according to Loren C. Eiseley, so, too, were many others, as cited by Deloria.

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<sup>150</sup>Haynes, *Mammoths, Mastodons & Elephants*, *op. cit.*, p. 285.

<sup>151</sup>Cynthia Irwin, Henry Irwin, George Agogino, "Wyoming Muck Tells of Battle: Ice Age Man vs. Mammoth," *National Geographic*, (June, 1962), pp. 831-832.

<sup>152</sup>Evan Hadingham, *Secrets of the Ice Age*, (New York, 1979), p. 93.

<sup>153</sup>Krishtalka, *Dinosaur Plots*, *op. cit.*, pp. 207-208.

"Many animals were in fact forest dwellers and could not have been affected by grassland fires. It would have been impossible, given forest environments, to have exterminated whole species under any conditions."<sup>154</sup>

This would clearly imply that, in forested America, meat was only a small part of ancient man's diet, although this, as Shipman explained, is not known. When the underpinning of the overkill hypothesis—namely diet—is in question, then one may fully understand that researchers are prone to regard it as clearly wanting.

All in all, Haynes concludes: "A sweeping conclusion that would indisputably pin the blame for proboscidean extinction on Clovis hunters would be a literary triumph, but a scientific impossibility."<sup>155</sup> This same conclusion is presented repeatedly by other researchers who have covered the same ground. Sanderson states:

"The whole problem of the extermination of the mammoths (particularly) has been bandied about for well over a century now but no worthwhile explanation of it has yet come to light, though a lot of suggestions have been made. One of the earliest and commonest of these was that man did the deed. At first, and in view of the history of destruction wrought on larger animals, life in modern times by men armed with poisons and finally firearms, this would seem to be quite feasible. However, on proper analysis . . . it simply does not hold water. First . . . 10,000 years ago Man was a comparatively rare animal, whereas Abu [elephants] were very numerous. Further, the former were still puny and badly armed, for all their corrals, pits, knowledge of fire, stone and bone weapons, and poisons; but the Abu were extremely virile, powerful, and undoubtedly displayed, then as now, an intelligence that, combined with their keen senses and natural instincts, gave them an almost uncanny aptitude for spotting poisons and avoiding hunters. Then, of course, Man, and even most efficient modern man has not been able [to date] to exterminate the Abu from Ethiopian Africa and from Oriental Asia, despite his enormous population therein. . . ."<sup>156</sup>

Lister's own conclusion of the "overkill" "blitzkrieg" theory is just as damning and more conclusive.

"Nonetheless, it is clear there is no convincing evidence—even in America— for kills on a scale that would have caused the extinction of the

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<sup>154</sup>Deloria, *Red Earth White Lies*, *op. cit.*, p. 112.

<sup>155</sup>Haynes, *Mammoths . . .*, *op. cit.*, p. 316.

<sup>156</sup>Sanderson, *The Dynasty of Abu*, *op. cit.*, p. 73.

species. To save the overkill theory from this problem, the idea of a 'Blitzkrieg' has been put forward: the mammoth were killed off so quickly, that little evidence was preserved. This idea is ingenious, but is difficult to prove one way or the other. In any case, it seems implausible that stone age hunters could, or would, have wiped out not only mammoth, but also dozens of other large animal species, across three continents and millions of square miles, in less than 2,000 years. In Siberia, for example, a vast important area of mammoth distribution, there is evidence of only sparse human occupation before 10,000 years ago.

"There is also the question over the timing of overkill. In Australia, for instance, the extinctions occurred toward the end of the Pleistocene, but people had arrived in that continent at least 40,000 years previously, and perhaps much earlier. Europe had been inhabited for hundreds of thousands of years before the mammoth became extinct. Even in America it is becoming increasingly clear that the Clovis people were not the 'First Americans'; there is growing evidence, especially from South America of earlier migrations.<sup>157</sup>

He then goes on to say:

"The overkill theory might still be tenable if the Clovis people in North America, and their contemporaries on other continents, were the first to have hunted mammoths and other big game extensively. In fact, it is becoming clear that they had a broader subsistence base than hunting the largest herbivores. Both in America and in Eurasia, the people of the late Ice Age relied on medium-sized animals—such as deer and bison—as their staple resources, as well as on small game and plant foods. Nor is there any clear indication of a technological advance that would suddenly have made the hunting of mammoths more likely or more feasible.

"In addition, many herbivores have been exploited since the Ice Age by much higher human population densities, yet they were not driven to extinction. Native Americans, for example, hunted bison, pronghorns, deer and wild sheep for millennia without causing their disappearance."<sup>158</sup>

All this and more has been amply discussed and shows that the hunting theory is largely without support from the evidence.

But well beyond this extinction, not only were megafauna supposedly annihilated, but birds as well, Martin concedes ". . . overkill is unlikely to have killed 10 classes of North American birds at the end of the last Ice Age."<sup>159</sup> Martin, however, argues they were mostly scavengers, but what of the few species that were not scavengers? There

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<sup>157</sup>Lister, *Mammoths*, *op. cit.*, pp. 129-130.

<sup>158</sup>*Ibid.*, pp. 130-131.

<sup>159</sup>Paul S. Martin, *Science News*, Vol. 132, (1987), p. 285.

were also some very small, burrowing animals that are extraordinarily difficult to hunt and kill that became extinct.

Then there is the problem of the extinction of big carnivores such as the American lion, saber-toothed lion, and the dire wolf. While on the other hand, timber wolves, wolverines, cougars, and grizzly bears survived. Björn Kurten claimed the size and abundance of the carnivores would be reduced in number over time if the megafauna were actually hunted to extinction. In the Middle East, as pointed out above, civilized man hunted the elephants there to extinction and, as he did so, the carnivores that preyed on their young and old diminished in number with the removal of their prey. If this occurred in the Near East we would expect the same also to have occurred during the Ice Age. Ward points out on page 145 of *The Call of Distant Mammoths*, "No such changes have yet been discovered in any assemblage of carnivores from North America. . . . Thus there is no evidence that the late Pleistocene megafauna of North America were declining in number and diversity," at the end due to overkill.

And finally, what then of the small burrowing rodent-like animals that met their end? Guthrie makes this explicit in that, "Two . . . [small] mammals [are] now extinct in Alaska. American badger . . . and black-footed ferrets . . ." <sup>160</sup> He makes it clear, "Humans would not likely have hunted these two small carnivores to extinction [in Alaska]." <sup>161</sup> Charles Lyell understood the impossibility of exterminating small rodent-like animals. In discussing the extinction of the post-Pliocene fauna he stated, "we know how tedious a task it is in our times, even with the aid of fire-arms to exterminate a noxious quadruped. . . ." <sup>162</sup>

Badgers and ferrets have been hunted by man but were not eradicated from their more southern environments. What was so unique about man's hunting techniques in Alaska which enabled him to destroy every single one of these creatures? Is it really probable that man then forgot or lost this hunting technique as he migrated south? Finally, what weapon or hunting technique enabled man to drive to extinction a jay bird in the Great Basin of America? Bird populations tend to be immense and it is beyond imagination to suggest that with spears (bows and arrows and more recent inventions) or any ancient weapon, man could kill off jay birds.

Then what about rabbits? One member of that order went extinct. "The tiny Aztlan rabbit . . . which has jack rabbit-like adaptations for running is known from Chihuahuan Desert of New Mexico, Texas and Mexico." <sup>163</sup> Now modern man in Australia has been unable to eradicate these prolific animals using every modern method of destruction, but advocates of the hunting hypothesis suggest ancient man could accomplish what modern man cannot.

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<sup>160</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, p. 248.

<sup>161</sup>*Ibid.*

<sup>162</sup>Charles Lyell, *The Geological Evidences of the Antiquity of Man*, (London, 1863), p. 374.

<sup>163</sup>Donald K. Grayson, *The Desert's Past*, *op. cit.*, p. 66.

Owen-Smith enlarges on this question of comparing megaherbivores extinctions to those of much smaller animals.

"For a predator to drive its prey to extinction, there are just two requirements: (i) a rate of harvest [or killing] exceeding the maximum sustained recruitment of the prey population; (ii) the possibility for predation to be sustained even when prey become rare. For modern megaherbivores, maximum rates of population increase vary from 6-7% for elephants. . . . If mortality due to predation were to exceed such levels, populations would decline inexorably towards extinction. . . .

"[Since] animals as large as megaherbivores have nowhere to hide [they can be driven to extinction]. But what about the smaller ungulates, with higher potential rates of population increase, that also went extinct? For them a human overkill scenario is far more difficult to sustain."<sup>164</sup>

The reason it is so difficult to exterminate very small animals such as rabbits is that they reproduce like rabbits, (pun fully intended). They are extremely difficult to kill because they are small, being hard to see, and representing a tiny target, and they breed prolifically. But, as several investigators strenuously pointed out, many of them went the same way as the mammoth.

Again, according to Loren C. Eiseley, not only were birds driven to extinction, but also fresh water animals such as mollusks and frogs.<sup>165</sup>

"We do know that the forests of the interglacial periods, as well as the tundra and steppes fringing the glacials during the glaciations, were inhabited by many small mammals which being rodents, were probably numerous. . . . But in the refuse heaps of ancient man the bones of small mammals are a great rarity, and there is not a single well-established case of bird bones as remains of a meal."<sup>166</sup>

Overkill advocates, nevertheless, have been able to adjust their theory repeatedly with ad hoc hypotheses to account for the many discrepancies in their concept, for example, Krishtalka poses the following problems and Paul Martin's responses.

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<sup>164</sup>Owen-Smith, *Megaherbivores*, *op. cit.*, p. 293.

<sup>165</sup>Loren C. Eiseley, "Archaeological Observations on the Problem of Post-Glacial Extinction," *American Antiquity*, Vol. 8, No. 3, (January 1943), pp. 209-17 as cited by Vine Deloria *Red Earth White Lies*, (New York 1995), p. 111.

<sup>166</sup>Willy Ley, *Dragons in Amber*, *op. cit.*, p. 117.

"But if Martin is right and the hunting reached overkill proportions, why are there are so few kill sites in the archeological record? Armed and ready, Martin answers with an ad hoc spray of rhetoric he calls the 'blitzkrieg' addendum: Overkill was so swift and devastating that few kill sites are to be expected. But how could Ice Age hunter-gatherers devour such tonnages of meat? Answer: Humans were probably as wasteful then as now. What about mammoths . . . [and other animals] that apparently survived the human blitzkrieg . . . —their remains at some sites date to between 9,000 and 5,000 years. Martin, with fairly good justification, claims those radiocarbon dates are suspect. . . . How does one account for the many species of birds and mammals that were not prey for Ice Age hunters and still become extinct? Martin says that they were scavengers that, because of overkill extinctions, were robbed of their steady supply of carcasses."<sup>167</sup>

All the arguments in defense of the hunting hypothesis are simply rationalizations. It is just as valid to suggest that there are few kill sites because mammoths were not greatly hunted. Humans did not kill more game than they needed, and did not waste the resources upon which they depended for sustenance. The dates of animals that survived the blitzkrieg into the hipsithermal are not *all* wrong or contaminated. The small mammals and small birds were not all scavengers and they also survived the blitzkrieg into the hipsithermal. Each of these responses are as logical, plausible, and scientific as the rationalizations and answers Martin and his colleagues present to defend this overkill view.

However, one final point must be put forth before moving onto the climate theory of extinction. This is presented by Lister thus:

". . . except in special cases of human arrivals on islands, it is rare in the archaeological record to find people wiping out their prey—when a resource becomes scarce, hunters will generally switch to another, and the species will recover. Human hunters, in general, live in symbiosis with their prey like any other predator."<sup>168</sup>

Man, as a primitive hunter, has lived on the Earth for thousands of years. But he has only, under a very few circumstances, annihilated entire species of animals on islands. To the contrary, the African hunter, the Australian aboriginal hunter, and the American Indian hunters, from Alaska to Patagonia, have hunted game since the end of the Ice Age and yet, the many species they hunted were never driven to extinction by this necessary activity. Why not? The answer is obviously that ancient and more modern primitively armed hunters do not drive animals to extinction. It is an ecologically

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<sup>167</sup>Krishtalka, *Dinosaur Plots*, *op. cit.*, pp. 206-207.

<sup>168</sup>Lister, Bahn, *Mammals*, *op. cit.*, p. 131.

unsound behavior and flies in the face of the basic ecological principal that organisms in a biome live in balance together. When predators become numerous they reduce the number of prey to the point where the predators begin to starve off or switch to other prey. Although modern man, with all his technology, can unbalance nature, primitive man could not do so. For the last 10,000 years, primitive hunters lived in ecological balance with their prey and, since that is undoubtedly the case, hunters had to have lived that way earlier.

One of the fundamental concepts of uniformitarianism is the concept of actualism, which means a scientist may not go beyond the evidence of what is actually operating in nature. In actuality, for the past 10,000 years, in Australia, Africa, or the Americas, so far as I know, never have primitive peoples with primitive weapons ever hunted to extinction large numbers of species upon which they depended for sustenance. To accept the overkill hypothesis, one must, in addition to all its other major problems, deny what is known from ecology and from the principles of uniformitarianism on this matter. The fact that scientists are willing to go beyond their own norms and principles shows that what they really espouse is unscientific.

Associated with this concept is the ability of man to improve his techniques of hunting over time. This aspect of man's ingenuity is that he gets better at what he does over time. Therefore, if ancient hunters hunted to extinction all these various species, then with time, he would have improved his hunting techniques. What necessarily follows is that man should have become an even more efficient hunter and driven to extinction the rest of the animals he preyed upon. Instead of becoming more efficient with time, these hunters became less efficient, which flies in the face of this well-understood, developmental process. It is utterly futile to suggest that the overkill process can explain the extinction with all these fundamental constraints.

Neither Martin nor his colleagues can accept, at face value, the number of negative facts that undercut the overkill theory to which they have devoted their professional lives. They have added ad hoc hypotheses repeatedly to explain away any and all forms of negative evidence. This approach does not improve the concept or make it more persuasive. As Grayson suggests, "In the process of responding to critics of overkill, the overkill hypothesis became so resilient that it could withstand virtually any factual onslaught. . . . In the end, the process seems to have made overkill unfalsifiable. . . ." <sup>169</sup>

In the end, we are faced with an argument, but not a testable theory. When any fact that contradicts the concept can be interpreted in a manner that makes it fit the theory, then there is never any evidence one way or the other by which one can finally test the validity of the idea.

But the fact that these same overkill advocates suppress dates that contradict the theory, withhold funds for research that would damage the concept, select only evidence that fits their belief, and fire and blacklist vulnerable researchers who have the desire to

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<sup>169</sup>Grayson, "Explaining Pleistocene Extinction," *op. cit.*, p. 820.

publish their negative findings, we are no longer in the domain of science but in the domain of power politics. For a thoroughly delightful debunking of the overkill theory, I cannot recommend highly enough Vine Deloria's wonderful book, *Red Earth White Lies*, (New York, 1995). Deloria presents a bevy of establishment absurdities ripe with his insightful remarks. It is, nevertheless, a serious book quite well-documented, hilarious at times, a joy to read.

## THE CLIMATE HYPOTHESIS

The other major theory for the Pleistocene extinction is based on a sudden onset of warm weather which drastically changed the environment and left the fauna in areas which no longer could support them. Unable to adapt to this rapid, environmental change they simply died out.

This theory had been suggested by Alfred Russel Wallace before he opted for the hunting hypothesis as more acceptable. What he originally believed is that the extinction had been brought about by "the great and recent physical [climatic] change known as the 'Glacial Epoch.'"<sup>170</sup>

Krishtalka summarizes this hypothesis thus:

"Paleobiologists in the 'whatdunit' [climate] school blame the wholesale extinctions on rapid climatic and environmental change at the end of the Ice Age brought on by the retreat of glacial ice. According to this scenario, temperatures became more extreme, devastating existing plant habitats and communities to the point where they could no longer support a diversity of plant eaters. These disrupted vegetational patterns, in turn, upset the longstanding, delicate balance in the ecosystem of grazing and browsing animals, perhaps affecting their reproductive behavior. Such massive upheavals of habitats, say the climate—blamers, led to the wholesale extinction of most of North America's large herbivores. . . ."<sup>171</sup>

Lyell, as long ago as 1853, suggested that mammoths could simply migrate to escape the fierce arctic winters given present arctic conditions.

"Whenever there is a continuity of land from polar to temperate and equatorial regions, there will always be points where the southern limits of an arctic species meets the northern range of a southern species; and if one or both

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<sup>170</sup>Alfred Russel Wallace, *The Geographical Distribution of Animals*, Vol. I, (New York, 1876), p. 151.

<sup>171</sup>Krishtalka, *Dinosaur Plots*, *op. cit.*, p. 205.

have migratory habits . . . they may each penetrate mutually far into the respective provinces of the other."<sup>172</sup>

In 1984, J. N. McDonald, an overkill advocate, also claimed that large mammals could have easily migrated south or north if they were adapted to either a cold or warm climate.<sup>173</sup> However, Haynes points out that many "wild animals under stress do not automatically embark on long treks in search of food and water, because they have no way of knowing what resources will be found in unfamiliar ranges."<sup>174</sup> In Africa long droughts do not cause elephants or rhinos to migrate. They simply do not know where to go.

The climate theory proposes that the habitats of the various animals were destroyed and that their edible flora that no longer existed drove the megafauna to extinction. But the same argument must also apply to the animals that did not become extinct.

Darwin saw definitively that this theory made no sense, and wrote about it during his visit to South America.

"No one I think can have marvelled more at the extinction of species than I have done. When I found in [Argentina in] La Plata the tooth of a horse embedded with the remains of Mastodon, Megatherium, Toxodon, and other extinct monsters, which all co-existed at a very late geological period, I was filled with astonishment; for seeing that the horse, since its introduction by the Spaniards in South America, has run wild over the whole country and has increased its numbers at an unparalleled rate, I asked myself what could have so recently exterminated the former horse under conditions of life apparently so favourable."<sup>175</sup>

What Darwin fully understood is that if the climate change was responsible for the extinction of the horse in America, why would the very same climatic condition that supposedly drove this animal to extinction be so fruitful for it? The contradiction was so obvious that it beggars description. To put this viewpoint into perspective Pielou explains:

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<sup>172</sup>Charles Lyell, *Manual of Elementary Geology*, 4th ed., (New York, 1853), p. 147.

<sup>173</sup>J. N. McDonald, "The Reordered North American Selection Regime and Late Quaternary Megafaunal Extinctions," *Quaternary Extinctions*, P. S. Martin, J. G. Klein, eds., (Tucson, Ariz., 1984), pp. 404-439.

<sup>174</sup>G. Haynes, *Mammoths, Mastodonts & Elephants*, *op. cit.*, p. 272.

<sup>175</sup>Charles Darwin, *Origin of Species*, (London, 1985), p. 322.

"However, to say that a species became extinct because of loss of habitat entails a circular argument. With the disappearance of the ice sheets, *all* habitats changed; and when a habitat changes, the old habitat can be described either as 'changed' or 'destroyed.' It is a matter of semantics. It is easy to say that the habitat of an extinct species was destroyed, whereas that of a still extant species was merely changed. But if the reason for saying so is simply that the extinct species is extinct, and the extant one extant, then the statement is not an explanation at all, but a play on words.

"Many animals—all the survivors—managed to adapt to the [climate] changes that accompanied disappearance of the ice sheets. Some responded by altering their geographical ranges."<sup>176</sup>

It is obvious that if certain extinct bison died off because of a climatic change than modern extant bison would have also become extinct. This contradiction is simply too large to swallow. The "steppe grazers such as bison had only to move northward in order to keep within their favoured environment, yet only one species survived; with few exceptions browsers such as mastodons and forest musk-oxen should have been able to do likewise, yet both succumbed."<sup>177</sup>

But if climate change was deadly to some of the species, it was beneficial to others.

A. M. Phillips, III analyzed the Shasta ground sloth extinction and was able to show that the environmental or climatological changes at the end of the Pleistocene could not have affected its source of nourishment but rather enhanced it.<sup>178</sup> And Marshall cites him thus: "Phillips . . . demonstrates that extinction of the Shasta ground sloth in Rampart Cave occurred about 11,000 yr. B.P., 'at a time . . . which should have been nearly ideal for its continued existence.'"<sup>179</sup> He goes on to say:

"There is no evidence of dietary, climatic, or environmental stress that could account for the extinction of this animal. Favorable or similar environmental conditions existed for about 3,000 years after its disappearance."<sup>180</sup>

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<sup>176</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 263.

<sup>177</sup>Richard Foster Flint, "Pleistocene Epoch," *Encyclopedia Britannica Macropedia*, Vol. 14, (Chicago, 1982), p. 569.

<sup>178</sup>A. M. Phillips, III, "Shasta Ground Sloth Extinction," *Quaternary Extinction*, P. S. Martin, R. G. Klein, eds., (Tucson, Ariz., 1984), pp. 148-157.

<sup>179</sup>Marshall, "Who Killed Cock Robin," *op. cit.*, p. 790.

<sup>180</sup>*Ibid.*

The very same dilemma also exists for American camels or *Camelops*. According to Haynes,

"*Camelops* especially should have been capable of coping with seasonal drought better than did *Mammuthus* and should have survived longer, and yet the big accumulations of mammoth bones postdate the largest last Pleistocene *Camelops* bone accumulations. . . .

"*Camelops*, like modern *Camelus*, [camels] undoubtedly was not dependent on water sources as were proboscideans such as *Mammuthus*, or *Loxodonta*. Modern camels roaming wild in the vast central Australian semideserts rely mainly on browse vegetation or succulent ground cover, not on water sources for moisture intake during dry years or dry times of the year."<sup>181</sup>

The assumption that camel-type animals died off because of the climate is exactly similar to that suggested for the American horse which also became extinct. Before the American Civil War, camels were purchased from ports in North Africa and landed in Indianola, Texas about 120 miles south of Galveston. These animals traveled overland to San Antonio where they apparently "thrived on native vegetation, and were not subject to unexpected diseases."<sup>182</sup> The camels thereafter were taken to the southwestern desert where they were employed by the Confederates during the Civil War to carry mail.<sup>183</sup> In time, as with the horse, camels escaped.

"They were ownerless camels, camels which had escaped, camels which had been born in the Arizona desert. In 1877 two Frenchmen rounded up thirty such ownerless camels near Tucson, Arizona, took them to Virginia City, and sold them to the Comstock Mine, which employed them as carriers for wood and salt. Some of them escaped again and for a number of years there was a center of wild camels along the Gila River. The engineers who laid out the line of the Southern Pacific Railroad saw wild camels quite often. . . .

"During the early [eighteen] nineties the United States Boundary Commission saw small groups of camels in many places along the Mexican border. In 1894 a local character . . . captured a considerable number at Gila Bend and sold them to circuses. . . ."<sup>184</sup>

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<sup>181</sup>G. Haynes, *Mammoths, Mastodons & Elephants*, *op. cit.*, p. 276.

<sup>182</sup>Willy Ley, *Dragons in Amber*, *op. cit.*, p. 264.

<sup>183</sup>*Ibid.*, p. 265.

<sup>184</sup>*Ibid.*, pp. 265-266.

Therefore, the camel—*Camelops*—could not have died out because of the change in climate that is proposed. As with the horse, it was well adapted to the climate that supposedly destroyed it.

Haynes, who made a fairly exhaustive study of drought on African elephants and the mortality caused by such prolonged periods of aridity states.

"Yet in spite of recurring heavy mortality during drought, *Loxodonta* populations have been able to bounce back and maintain healthy growth rates. This ability to recover following serious die-offs in Africa is striking and has made one think again about the late pleistocene climatic stresses on mammoths and mastodons. . . .

The most important lessons to be learned from studies of modern elephant die-offs have to do with proboscidean responses to climatic change and with proboscidean resilience, allowing recovery from nearly any environmental stress. . . ."185

With respect to New Guinea and Australia regarding the climate thesis, Flannery reports:

"A further problem for the climate theorists is that some species were affected that the theory might predict should not have been, while others which one would predict might have been vulnerable to climate change survived. . . .

"Among the groups that, on the basis of their biology, one would predict should not have been affected but which were, are giant marsupials that inhabited the wet subalpine grasslands and montane rainforests of New Guinea. All seven species became extinct despite the fact that they should have been protected from climate change, as their habitat never vanished, but merely shifted a thousand metres [3,300 feet] or so up and down New Guinea's mountains in response to cooling and warming climates. . . .

"Among the species that one would expect to have been affected by extreme aridity and yet which survived, are the hairy nosed wombats and some larger kangaroos. The hairy nosed wombats are larger than some species that became extinct. They live in burrow complexes around the margins of the arid zone and cannot easily migrate in response to climate change. Furthermore, they depend upon good quality short grass [which requires a wet climate] for survival. They seem like a prime candidate for extinction under the climate hypothesis, yet they survived. Likewise, the large red and grey kangaroos inhabit areas that were greatly affected by the ice age climate shift. They are larger than many extinct

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<sup>185</sup>Haynes, *Mammoths, Mastodons & Elephants*, *op. cit.*, pp. 316-317.

species [and thus would require more forage than those that became extinct].  
Why did they survive?"<sup>186</sup>

Thus, as with New Guinea near the equator, where climate change was, in most instances, minimal, there should have been no or very few extinctions, but in spite of little change in the climate habitat, the giant marsupials disappeared. In Australia, hairy-nosed wombats require rainfall for their high quality, short grass diets. Yet, when Australia became more arid, they survived requiring more forage than the small ones that would require less vegetation. And exactly the same applies to large red and gray kangaroos. They also require more vegetation than their smaller, extinct cousins to survive. Yet the smaller ones perished while they managed to flourish, exactly the opposite of what the climate theory would predict occurred to various animals.

As for the climate extinction in Australia, Ward's comment is telling:

"And in Australia, there were no glaciers and no sudden warming event such as occurred in North America and Europe. The climate changes were nowhere near as dramatic as in North America, and yet the rate of extinction was higher."<sup>187</sup>

Diamond's comment on the Australian and New Guinea extinctions is also telling.

"I can't fathom why Australia's giants should have survived innumerable droughts in their tens of millions of years of Australian history. . . . The giants became extinct not only in dry central Australia, but also in drenching, wet New Guinea and southeastern Australia. They became extinct in every habitat without exception, from deserts to cold rain forests and tropical rain forests."<sup>188</sup>

It is worth stressing that

"If we are heading to a climate . . . that [warms], then animals and plants that are adapted to cooler climates are going to have to move. They will either chase their shifting climate zones, or they will die. . . . They will have two general lines of retreat: uphill or toward the poles. Climbing 500 meters [16,000 feet] up a mountainside is like moving 250 kilometers [150 miles] north. Indeed,

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<sup>186</sup>Flannery, *The Future Eaters*, *op. cit.*, pp. 185-186.

<sup>187</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 152.

<sup>188</sup>Diamond, *Guns, Germs, and Steel*, *op. cit.*, pp. 43-44.

there are mountains in South America where tree lines have migrated upslope as much as 1,500 meters [5,000 feet] to beat the heat after an Ice Age [equivalent to a 900 mile movement northward or southward].

"As the world warms up [as it did during the Eocene], consider what happens to a population on the slope of a mountain. The peak is smaller than the base, so as the climate gets warmer and the species shifts upward, it is forced into a smaller and smaller space. Soon the population is cut off from those of neighboring peaks; where once it was joined to others at the base of the mountain, it now lives on an island."<sup>189</sup>

The point to emphasize is that climate cannot be employed as a source of destruction of certain animals (mammoths) if its effects can be shown to also produce environments beneficial to others (camels) which also became extinct. This becomes an especially telling argument with respect to plants and cold blooded life forms. If the climate could exterminate large, warm-blooded animals, then it would have had an even more profound effect on organisms dependent on climate.

According to S. H. Schneider and R. Londer:

"There are at least 200,000 known species of Coleoptera-beetles, the largest order of the insects. The ubiquitous beetle responds quickly to changes in its environment, most notably the climate. Because they can leave an area rapidly when the climate conditions no longer suit them, beetles don't necessarily have to perish or adapt."<sup>190</sup>

However, because these beetles are plant specific in their diets, they eat only one or a few particular plants, and therefore, for the beetle to migrate, it must find the same plant, otherwise it will become extinct.<sup>191</sup>

The most basic argument of the climate extinction advocates is, therefore, in contradiction to the most basic evidence that they are advocating. If ancient elephants and other mammals lived predominantly on grasslands with few trees, then most if not all of them would have had an abundant grassland environment in the Americas and Eurasia after the Ice Age ended, and should not have become extinct.

Instead of going extinct, the animal populations should have grown much larger. According to Pielou,

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<sup>189</sup>Jonathan Weiner, *The Next One Hundred Years*, (New York, 1990), pp. 178-179.

<sup>190</sup>Stephen H. Schneider, Randi Londer, *The Coevolution of Climate & Life*, (San Francisco, 1984), p. 46.

<sup>191</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 63.

"Surely the climate amelioration [after the Ice Age] and the tremendous expansion of the habitable land area that came with the disappearance of the ice sheets should have caused animal populations to grow bigger rather than dwindle to extinction. The phenomenon to be explained is the direct opposite of what common sense would suggest."<sup>192</sup>

This is highlighted by Owen-Smith who argues:

"Nevertheless, it is difficult to understand why the Holocene grasslands of the United States and Central Asia were inadequate for the continued existence of such tolerant grazers as mammoths must have been. Even the most uniform regions of vegetation have local zones of higher diversity along rivers or alluvial fans [water laid sediments] or in mountainous areas. Bison persisted in vast numbers on the mid-continental grasslands; while the Columbian mammoth, which had been abundant throughout this region during the Pleistocene, fell by the wayside."<sup>193</sup>

Ward describes the habitat of North America that replaced the supposed Ice Age grasslands in which

". . . the surviving mammals flourished. White-tailed deer ranged through the high plains and western mountains. Huge herds of pronghorn antelope spread across the western prairies sharing the bountiful grass with herds of plains bison and elk. Prairie dog colonies covered great expanses of territory, and packs of wolves, mountain lions and great bears vied for food among the abundant herbivores of the west. In the eastern regions an even larger bison [lived] in the vast forests along with herds of elk and giant moose. Great flights of waterfowl and other birds blackened the skies. It was a continent rich in life but very poor in its diversity of large mammals."<sup>194</sup>

He also mentions that "extant elephants and rhinos are tolerant of a wide variety of food sources and habitat conditions."<sup>195</sup> Then why should extinct elephants and rhinos be far less tolerant? For example, he points out, "Woolly rhino were prominent in

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<sup>192</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 261.

<sup>193</sup>Owen-Smith, *Mega-herbivores*, *op. cit.*, p. 288.

<sup>194</sup>Ward, *The Call of the Mammoths*, *op. cit.*, p. 135.

<sup>195</sup>*Ibid.*, pp. 287-288.

Pleistocene faunas through much of Eurasia, especially Mongolia where grassy steppe still persists."<sup>196</sup>

If climate changed the habitat, it should have done so for all grass-dependent species and not just for certain ones. The thousands upon thousands of bison that roamed and thrived on the American prairies meant that this great grassland was an ideal environment for all the grass-eating megaherbivores. Instead of becoming extinct, megaherbivore numbers should have swelled, as it evidently did with the bison. Owen-Smith sums up this dilemma thus: "No explanation has been advanced as to why habitat changes were especially inimical to the survival of megaherbivores."<sup>197</sup>

The problem related to the climate theory is simply this: climates that would cause the extermination of some species will be the very same climates that will enhance the conditions for life of others. This is the Catch 22 problem with all the various climate concepts.

A specific case is presented by Colin Tudge:

"On the Colorado plateau . . . Larry Agenbroad and Jim Mead have discovered mammoth dung from around 13,500 to 11,600 years ago, and found that it is rich in the remains of grass, sedge, spruce, sagebrush, and saltbush. In the places where this dung was found these plants no longer exist, for the climate now is hotter and drier, and so we may conclude . . . that the elephants disappeared because their favored plants had gone. But the Colorado Plateau is not flat, and as we go uphill it becomes cooler: a change of altitude is like a change of latitude. And the plants that the last of the Colorado mammoths were eating 11,000 or so years ago are still to be found 4,000 feet up the slope. Whatever these elephants died of then, it was not [for] lack of food. . . ."<sup>198</sup>

Jared M. Diamond makes the emphatic point thus:

"If late Pleistocene extinctions of animals were due ultimately to altered climate, the animal extinctions should have been mediated at least partly, perhaps largely, by plant extinctions. Where is the evidence for the plant extinctions that were supposedly responsible?

"In fact, we have megafaunal extinction waves without floral extinction waves. It is not that we should be able to detect fossil extinctions of plant species if they had occurred. About twenty-five extinctions of plant species are known

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<sup>196</sup>*Ibid.*, pp. 288.

<sup>197</sup>*Ibid.*, p. 287.

<sup>198</sup>Colin Tudge, *The Time Before History*, (New York, 1996), pp. 301-302.

for New Zealand, mostly Pliocene and early Pleistocene, none late Pleistocene [when the megafauna became extinct]. A similar pattern applies to western Europe. . . . How could climate have eliminated mammoths and ground sloths, while the plant species represented in their gut contents and dung remain abundant and widespread?

"Climate should have had the least effect on those animals best buffered against climate, the homeotherms [warm-blooded animals], and should have had the most devastating effect on the animals least buffered against climate, the poikilotherms [cold-blooded animals]. In fact, it was one of the two classes of homeotherms, the mammals that suffered worst. Why was there no devastation of beetles . . . fish, amphibia, and reptiles?"<sup>199</sup>

This criticism has not been answered, and five years after Diamond wrote this, Krishtalka raised it again.

"Different criticisms haunt the climatic theory of Ice Age extinctions, especially their selective impact. Why, along with large mammal extinctions, wasn't there equivalent devastation among plants and cold-blooded animals (for example reptiles, amphibians, fish, and beetles)?"<sup>200</sup>

Even if one were to suggest beetles migrated to different regions where the same plants somehow lived under very different climatic conditions, fresh water fish in ponds and lakes, especially in Siberia where drainage is to the Arctic Ocean, would have been unable to escape the climate onslaught. As for amphibians, such as frogs, or reptiles such as snakes, it is extremely difficult to imagine how these very small creatures could have migrated to escape the fate that befell the mammoths.

The most common argument raised against the climate hypothesis is based on analogy. Since there were many different Ice Ages, there had to have been many climatic extinctions of these large animals when the ice caps disappeared. But contrary to this expectation, Flint states:

"Rates of change of Quaternary environments were generally more rapid than rates of evolution in Quaternary organisms. The same faunas may appear repeatedly in successive strata, and their transgression of time is commonly evident."<sup>201</sup>

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<sup>199</sup>Jared M. Diamond, "Historic Extinctions: A Rosetta Stone for Understanding Prehistoric Extinctions." *Quaternary Extinctions*, P. S. Martin, R. G. Klein, eds., (Tucson, Ariz., 1984), p. 850.

<sup>200</sup>Krishtalka, *Dinosaur Plots*, *op. cit.*, p. 207.

<sup>201</sup>R. F. Flint, *Glacial and Quaternary Geology*, (New York, 1971), p. 376.

The same holds true for flora. According to Bowen, "The fact is that similar constellations of species were repeated several times in the Pleistocene, though not perhaps with the same relative abundance."<sup>202</sup>

If the climatic stresses created by the end of the last glaciation drove these various fauna to extinction, how could these very same genera have survived the previous glaciations so well?

This, in fact, was understood as long ago as 1863 by Hugh Falconer. Speaking of the mammoth, he claimed:

"The whole range of the Mammalia, fossil and Recent, cannot furnish a species which has had a wider geographical distribution, and at the same time, passed through a longer term of time, and through more extreme changes of climatical conditions, than the Mammoth."<sup>203</sup>

Grayson emphasizes that

". . . it is quite difficult for them [climate extinction proponents] to answer a simple and appropriate question. 'Why after surviving a succession of four or more glacial advances, do most elements of the large mammalian faunas of the Northern Hemisphere disappear during the last glaciation?' . . . Why extinction at that time, when the animals had been through similar changes before?"<sup>204</sup>

What is most damning to the climate extinction hypothesis is that, during one of the interglacial periods, the climate change was far greater than that which accompanied the end of the Wisconsin that supposedly ended 12,000 years ago. This was pointed out by N. J. Shackleton, *et al.*,<sup>205</sup> and by C. Lorius, *et al.*,<sup>206</sup> Owen-Smith cites these papers to show that

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<sup>202</sup>D. Q. Bowen, *Quaternary Geology A Stratigraphic Framework for Multidisciplinary Work*, (New York, 1978), p. 38; See also, J. A. Sutcliffe, *On the Track of Ice Age Mammals*, (New York, 1985), p. 52.

<sup>203</sup>S. Stanley, *The New Evolutionary Timetable*, (New York, 1981), p. 102.

<sup>204</sup>Grayson, "Explaining Pleistocene Extinctions," *op. cit.*, p. 817.

<sup>205</sup>N. J. Shackleton, *et al.*, "Carbon isotope data in core V19-30 confirm reduced carbon dioxide concentration in ice age atmosphere," *Nature*, Vol. 306, (1983), pp. 319-322.

<sup>206</sup>C. Lorius, *et al.*, "150,000 year climate record from Antarctic ice," *Nature*, Vol. 316, (1985), pp. 519-596.

". . . the record of temperature changes, as indexed by oxygen isotope ratios both in marine foraminifera and in Antarctic ice, shows no significant difference in rate between the Illinois-Sangamon and Wisconsin-Holocene transitions. Furthermore, during the Sangamon interglacial temperatures evidently rose 2-3°C warmer than those experienced during Recent [hipsithermal] times. . . . Hence the reorganization of habitats relative to glacial conditions was likely to have been more extreme than at present."<sup>207</sup>

Cesare Emiliani remarks on the notable climate conditions that existed during that last interglacial:

"During the last hipsithermal 125,000 years ago, global temperatures were significantly higher than today, especially in middle and high latitudes. In fact [tropical] red soils developed in the North American midcontinent as well as Southern Europe, whereas only [temperate] brown soils developed during the Holocene [10,000 years ago to the present]."<sup>208</sup>

This means that central North America and Southern Europe had a tropical climate during the last interglacial. Hence, the climate extremes during the Sangamon interglacial were far greater than that of the hipsithermal of the Holocene. This greater temperature change would therefore have been much more destructive to the mammals. Why, then, during the earlier more destructive climate change did the megafauna survive while during the later less destructive one they perished to the last one? Needless to say, this logic and evidence makes no sense whatsoever. Based on the climatic theory these animals should have become extinct during the last interglacial. That they did not only confirms the fact that these creatures were not affected by the climate change in any manner either during the last interglacial or during the changeover from the Pleistocene to the hipsithermal.

Therefore, at the very least, even if the mammoths and other fauna somehow managed to survive the three or more preceding Ice Ages, there would have been massive die-offs that also occurred at those other crises. Since that is the only possibility to explain their survival one would naturally ask where is the evidence for these past great dyings. Haynes' comment is telling.

"Thus if the late Pleistocene mammoth bone accumulations indeed resulted from the climate stresses on mammoth populations, there should have

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<sup>207</sup>Owen-Smith, *Megaherbivores*, *op. cit.*, p. 287.

<sup>208</sup>Cesare Emiliani, *Planet Earth*, (New York, 1992), p. 545.

been earlier mammoth die-offs resulting from the earlier climatic reversals. Apparently there were none."<sup>209</sup>

Colin Renfrew and Paul Bahn further argue:

"Extinctions caused by climatic change had occurred previously, but tended to affect all size classes of mammals equally. . . ."<sup>210</sup>

This is the same kind of problem endemic to the hunting hypothesis and the inability of that theory to explain why the process couldn't kill off rabbits, birds, and other small creatures that became extinct. If the climate theory is correct, then not only would the large megaherbivores have become extinct, but also their smaller cousins. Not only should the North American camel have disappeared, but also the South American llama. Not only the saber-toothed lion, but the puma; not only mountain deer, but other deer, as well; not only giant beavers, but also the small ones that survived; not only one form of rabbit, but the other forms also, and on and on.

As Silverberg argues, if the climate change caused the extinction, "Why did the dire wolf die, but not the timber wolf? Why did the giant bison disappear completely, while the bison of the American prairies thrived by the millions? Why did the prehistoric short-faced bear go, but the grizzly bear remain?"<sup>211</sup> He goes on to show a "group of snails" disappeared.<sup>212</sup>

Then comes the same massive contradiction described with *Elephas* in the last chapter. *Elephas*, the Asian elephant, died out in Africa but not Asia. If the climate in Africa changed sufficiently to exterminate the Asian elephant, why did it not do the same to its African relative that survived the climate change? If the climate in Africa extirpated the Asian elephant there, why didn't the climatic change do the same to it in Asia?

And what of the mammoth in northern China which became extinct because of the climate change but not the Asiatic elephant in southern China? If the climate drove the mammoth in the north to extinction, why didn't the climatic change do the same to *Elephas* to the south?

But, in the north of China, there lived the woolly rhinoceros, while in the south Sanderson, reporting on H. T. Chang's work, shows ". . . several reliable and almost

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<sup>209</sup>Haynes, *Mammoths, Mastodonts & Elephants*, *op. cit.*, p. 283.

<sup>210</sup>Colin Renfrew, Paul Bahn, *Archaeology Theories, Methods, and Practice*, 2nd ed. (London, 1996), p. 237.

<sup>211</sup>Silverberg, *Mammoths, Mastodons and Man*, *op. cit.*, p. 171.

<sup>212</sup>*Ibid.*, p. 182.

modern reports [prove] that rhinoceroses were still quite common in Honan as late as A. D. 1,263. . . ."<sup>213</sup> And like the elephant, as Chadwick earlier showed in Africa, "can be found from the edge of deserts to the deepest rain forest; they live in savannas of the plains, as well as highlands"; rhinos are no less resistant to climate change.

"Rhinos are amazingly adaptable. They are found in the entire range of African terrain—from scorching deserts to middle-altitude brushlands, to the chilly summits of 12,000-foot mountains. They can survive for months in areas lacking surface water, and exist on the moisture acquired from eating succulent plants."<sup>214</sup>

So why should the northern Eurasian woolly rhinoceros have gone extinct like the mammoth is yet another contradiction. And, as the rhinoceros relates to the hunting hypotheses, why were woolly rhinos any less violent than modern ones?

"The black rhino is amazingly agile. He can leap from a prone position in the twinkling of an eye, charge at 30 miles an hour, and scramble up steep rocky slopes like a mountain goat. His fury is directed against inanimate objects as often as men. He will charge a car and reduce it to junk. One Kenya game warden found a rhino stuck in a mudhole and pulled him out with his Land Rover. The quarrelsome beast repaid the favor by caving in the side of the vehicle. On another occasion, a rhino was seen battering furiously at a parked tractor. Rhinos sometimes charge passing trains. But this is an uneven match; the train wins.

"The black rhino's bad temper is such that he is even conceived in a rage. If a female feels amorous, she charges headlong at a likely suitor and pushes and gores him until he is a bloody mess. If, after this, the male is still willing—and of course, still alive—mating takes place. The female may then batter the male a few more times for good measure."<sup>215</sup>

Are we to assume that woolly rhinoceroses were truly tame, docile creatures allowing man to injure them, and then not trample and gore the creature that inflicted the pain?

Again, it must be emphasized that elephants and, by being a similar species, mammoths, can live in a large number of different environments. They are highly adaptable animals, as Chadwick shows.

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<sup>213</sup>Sanderson, *Dynasty of Abu*, *loc. cit.*

<sup>214</sup>David Reed, "Rhino!" *Our Amazing World of Nature: It's Marvels & Mysteries*, (Pleasantville, N.Y., 1969), p. 95.

<sup>215</sup>*Ibid.*

“From desert sands to lush rainforests and lowland swamps to subalpine meadows, elephants occupied a broader assortment of habitats than almost any other large mammal on the African continent. . . . on the island of Lamu, more than a mile off the coast of Kenya . . . Elephants were once common . . . and . . . could be seen snorkeling across the open sea between Lamu and the mainland. . . . At the same time, elephant carcasses have been found 16,000 feet high on Mount Kenya, just below the glaciers. . . . I had seen where groups . . . had munched on giant groundsel [a common herb] along talus slopes at 14,000 feet.”<sup>216</sup>

Is it remotely possible that an animal so similar to the elephant as the mammoth that recently and, in many instances, lived in and around deserts, rainforests low land swamps, subalpine meadows, can swim to islands in the ocean live adjacent to mountain glaciers, and survive in innumerable droughts fail to survive a climate warming which expanded the vegetative areas around it? The very great adaptability of this elephant and its mammoth cousin is simply another contradiction in the long line of contradictions.

All these criticisms are too basic and contradict the theories. Neither the overkill nor the climate hypotheses can in any real or measurable way account for this worldwide extinction. They are too full of contradictions.

The critical points and arguments made by the overkill advocates of the climate hypothesis are as devastating as the critical points and arguments made by the climate extinction proponents of the overkill hypothesis. Neither side can present anything like definitive evidence that will support their theses, or vanquish the opposing group, or will settle the debate.

To make matters worse, overkill and climate theorists interpret the fossil finds to prove their own theory, attack that of the opponent theory, and when necessary, interpret the same evidence first to prove one thing then to prove just the opposite. As Haynes points out:

"It is the way the findings are *interpreted* that may be judged good or bad. Interpretations vary from insupportable to strongly supported, from low quality to high. In general, overinterpretation of data from sites is an exercise in making one story plausible at the expense of other stories. In some cases, quite different sets of data have resulted in virtually identical interpretations, whereas in other cases similar data have been interpreted in distinctly different ways. Like Rorschach inkblots, the data can have different meanings depending on the individualized desires and wishes of the interpreter."<sup>217</sup>

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<sup>216</sup>Chadwick, *The Fate of the Elephant*, *op. cit.*, p. 122.

<sup>217</sup>Haynes, *Mammoths, Mastodons & Elephants*, *op. cit.*, p. 205.

For example, if the climate was responsible for the extinction, why did the megafauna die off in the tropics where there was only moderate climate change? If the climate was responsible for the extinction, "Why did the last glacial retreat across the Northern Hemisphere ravage the American faunas but barely scar the European ones?"<sup>218</sup> There are fundamental contradictions almost at every turn with both the hunting and climate extinction scenarios.

What ultimately invalidated the climate theory is evidence of the mammoth and mastodon tusks which, like trees, grow annual rings which tell about the habitat and the food supply.

"During times of environmental stress and drought, tree rings are close together because little growth has taken place. During good times, however, when the tree is undergoing rapid growth as a result of an abundance of water, ample nutrients, and favorable temperatures, the rings are widely spaced. The tusks of elephants, mastodons, and mammoths respond in similar fashion. During periods of high growth they are well spaced; during times of food deprivation they are cramped together. And elephant tusks reveal far more about the life of the elephants than a simple chronology of good times and bad. Elephant tusk rings, and the chemicals locked within them, can offer accurate clues not only to how much an individual ate by the isotopic fraction of nitrogen and carbon locked up in the tusks, for these isotopes are found in different percentages in various plants eaten by the proboscideans.

"For a female elephant, birth events are also recorded in the tusks. The tusk rings reveal how many times in her life she reproduced and the length of time between births. During pregnancy a female grows little [or narrow] tusk [rings], because the calcium normally used in the tusk formation is diverted to bone formation in the fetus. This pregnancy produces a readily observable gap in the tusk's growth record. . . .

"In October of 1996 at an annual gathering of the Society of Vertebrate Paleontologists held in New York City [Dan] Fisher [of the University of Michigan] reported that the last [surviving] mammoths and mastodons were apparently fat, fit and well fed. The tusks examined show no evidence that . . . [these elephants] died of starvation. At least in the areas he studied. Fisher has effectively demonstrated the falsity of one prediction of the climate hypothesis. The mammoths and mastodons did not die of starvation."<sup>219</sup>

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<sup>218</sup>Krishtalka, *Dinosaur Plots*, *loc. cit.*

<sup>219</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, pp. 217-219.

Females apparently show that they gave birth once every four years.<sup>220</sup> But this gives no support for overkill since, in an environment with much edible vegetation, mammoth young will grow quickly and thrive to become more self-sufficient early. This is not a clear indication that females were giving birth rapidly to offset the reduced population due to hunting. The point, according to Owen-Smith, is that "African elephants' mean conception intervals vary between 3.3 and 5.5 years."<sup>221</sup> Even with a longer gestation period for mammoths because they were larger and heavier, proboscideans will not be greatly different from that of African elephants, the calves will begin feeding on vegetation at about four months of age and at 28 months spend a similar portion of their time feeding as adults. This will leave the mother elephant free sometime thereafter to come into estrus and produce a new calf. The same is also true of the smaller Asian species, "Birth intervals of Asian elephant females are about four years, both in the wild and in captivity."<sup>222</sup> So, as one can see from small Asian to larger African to Mammoth, the birth rate is once about every four years.

On April 15, 2000, at 9:00 pm E.S.T., the Discovery Channel, in the New York area, carried a documentary, "Resurrecting the Mammoth." In it Dan Fisher gave an interview in which he claimed that the last of the mammoths were giving birth about every three to four years. He claimed the mammoths' birth rates, as exhibited by their V-shaped tusk rings, show no indication of any stresses that inhibited their normal rates of conception, pregnancy, or the birth of offspring. The idea that mammoths were under stresses when the end came, either from the environment's capacity to feed them, or from hunting stresses, which greatly reduced their population, is unsupported. A sudden, global catastrophe, on the other hand, would leave the record found in their tusk rings just as it is found.

The final argument "is to meld the two theories—overkill and climate—into one." Owen-Smith summarizes it thus:

"1. Sustained human predation causes naive populations of megaherbivores to decline as harvests [killings] exceed replacement [birth] potentials.

"2. The climatic and habitat changes associated with global warming compress megaherbivore distributions and places these species under increased food stress, making them more vulnerable to being hunted to extinction.

"3. The disturbing influence of megaherbivores on vegetation [by overgrazing and trampling] is thereby removed [destroyed], leading to trends toward domination by late successional plant species and more uniform zonal

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<sup>220</sup>*Ibid.*, p. 219.

<sup>221</sup>Owen Smith, *Megaherbivores*, *op. cit.*, p. 144.

<sup>222</sup>*Ibid.*, p. 145.

habitats. [The new habitats are not made up of the plants necessary for survival for plant eaters].

"4. [This] Vegetation becomes less favorable for smaller herbivores, inducing population declines by these species, with predation by humans [now] deprived of megaherbivores probably promoting their slide towards extinction. . . .

"5. Mammalian carnivores and scavenging birds decline due to the disappearance of much of their food resource.

"6. Birds and other small vertebrate species [that were] dependent upon the disturbed habitats created by megaherbivores disappear."<sup>223</sup>

The problem with this scenario is simply that the habitat, Owen-Smith's item "2," was not compressed into narrow refuges. The megaherbivores supposedly inhabited steppe-like grasslands and, with the end of the Ice Age, these regions did not disappear; they became enlarged in the United States and in Eastern Europe in the Ukraine and also in northern Mongolia. For those species that needed forests, these habitats also existed all across North America and Eurasia. Therefore, the rest of Owen-Smith's climate-overkill amalgamation falls to pieces. The megafauna were not forced into small refuges where they could destroy the vegetation and were more easily exterminated. The vegetation for small herbivores was always available either in grasslands or forests, so their populations did not dwindle toward extinction. Carnivores always had game in various forms available upon which to survive, and scavenging birds would still clean up their leavings and thus also survive in smaller numbers. The entire scenario of this amalgamation is a house of cards. It, like the climate theory or the overkill theory, is another fabrication, another fiction. For another more in depth analysis of this new theory, see Colin Tudge's, *The Time Before History*, page 304 *ff*. In this scenario, it is assumed that instead of climate delimiting the number of mammoths to the point where they are hunted to extinction, the story is reversed and the hunters over-slaughter and reduce the population so that the climate and other vagaries such as disease, accidents, drought, etc., deliver the *denouement*. But this evidence is simply circular reasoning. While not knowing that the hunters could or even did reduce the various populations, it is taken as a given that they did. Then the other factors act to bring down the curtain on this two-act play. These scenarios are excellent drama but Bad Science. The final point is that the carnivore populations did not diminish as expected and required if the animals they preyed upon were reduced in number. This means that the herbivore populations were large and not becoming extinct at the time of the extinction. This we discussed above regarding the hunting theory.

And so the debate continues to rage, leading either nowhere or into blind alleys. Since each side in the debate is convinced that the evidence against the other is so fundamental and voluminous, it concludes that even with its own inconsistencies, flaws,

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<sup>223</sup>Owen-Smith, *Megaherbivores*, *op. cit.*, pp. 294-295. See also, N. Owen-Smith, "Pleistocene Extinctions: The Pivotal Role of Megaherbivores," *Paleobiology*, Vol. 13, (1987), p. 351.

and unanswered problems, its position must be correct and, therefore, refuses to concede. The questions raised by this extinction are as unsettled and divisive as ever, and the answers as elusive, strongly suggesting that the two opposing theses are wrong, individually or together, as an explanation. Instead of more research leading to consensus, it has led to greater and greater entrenchment and disagreement. And this is all because uniformitarianism is the basis of all modern theory to explain the extinction.

Because there is presently no solution to the problem, a new theory has been invented to assist the others to explain the ancient extinctions. It is actually not new, but has been resurrected because apparently, nothing will convince these scientists that the extinction was either climatic or blitzkrieg in nature. Dr. Ross D. E. MacPhee, at the American Museum of Natural History in New York, has advanced the disease hypothesis.

Hibben, back in 1968, makes small work of this concept.

“ . . . an ingenious theory was advanced that all the Pleistocene animals were killed by parasites and disease. A Pleistocene tsetse fly was pulled out of the hat to account for this mass [extinction] phenomenon. It was alleged that the tsetse fly had killed thousands of animals in Africa and could well have done so in ancient America. Hundreds of thousands of tsetse flies, laying millions of eggs in the nostrils of the Pleistocene herds of early America, might have strewn the landscape with the carcasses of Pleistocene life.

“There is a certain fascination to an insect theory. . . . The explanation hardly seems adequate, however, at least to dispose of all kinds of animals in all varieties of places and climates. What would have killed off the horse probably would not have affected the bison. If the mastodon succumbed, the mammoth would have survived. Even supposing invasion of several kinds of parasites, the supposition bears little weight when we think of the immensity of the Pleistocene world and the number of animals involved. Parasitic attacks on animal life usually involve a region or climate and certain kinds of animals. It would have to be a super tsetse fly [or disease] that would cause the extinction of both the bison herds of Alaska and the camel of Texas. There is no doubt that diseases play a large part in the lives of animals, but an unparalleled series of outstandingly toxic insects or parasites would be needed to account for this mass execution.”<sup>224</sup>

This new component, nevertheless, still requires that man spread the disease into the new continents he entered. This, again, requires that man did not enter the Americas prior to 12,000 years ago, or Australia 40,000 years ago. He must, therefore, side with the anthropologists who refuse to accept the evidence for the peopling of America prior

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<sup>224</sup>Hibben, *The Lost Americans*, *op. cit.*, p. 165.

to 12,000 B.P. The desperation to find an answer in terms of uniformity is leading to fantasy.<sup>225</sup>

Based on uniformitarianism there can be three causes that lead to the Pleistocene extinction: climate, hunting or disease or some combination of these. But in retrospect, this indicates that there has not been a generally accepted new idea (based on uniformity) for 300 years. In 1697, Thomas Molyneux presented his explanation of the extinction of the Irish giant deer in the *Philosophical Transactions of the Royal Society*, Vol. 9, pages 485-512. Sutcliff summarizes his thesis thus:

"Molyneux' conclusions were far in advance of the general level of scientific thought of the time. In 1697, he was already doubting the universality of the Biblical Deluge; and he did not attempt to attribute the extinction . . . to a single cause, but saw climate and disease as part of a chain of factors reducing the great deer population to a size where it could be exterminated by man."<sup>226</sup>

As we have observed, all these causes singly or together are fraught with innumerable problems, paradoxes and contradiction. But they will not, nor cannot be doubted as the ultimate causes by those whose preconceptions disavow global catastrophism. To such researchers the view that this extinction was caused by a global catastrophe and flood is tantamount to invocation of miracles, and pseudoscience. What this book advocates is simply irrational heresy to these researchers.

In my view, Raup makes an extremely cogent point respecting the blitzkrieg and climate theories in a chapter provocatively titled "Beware of Anthropomorphism."

"Various authors . . . have made lists of causes that have been suggested for the big mass extinctions. . . . I think most of my colleagues would agree on the following as serious candidates, not listed in any particular order:

"[1] climate change especially cooling and drying

"[2] sea level rise or fall

"[3] epidemic disease (a kind of predation)

"[4] competition with other species [as with man against mammoth]

"Each item just listed is reasonable. But I see more than a hint of anthropomorphism here. What are the traditional worries and concerns of people. . . ? The weather, especially cold and lack of rain; water levels (flooding or drying up of rivers and lakes); attacks by wild animals . . . or by other people or nations; infectious diseases; and competition (with each other or other

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<sup>225</sup>William K. Stevens, "Disease is New Suspect in Ancient Extinctions," *The New York Times*, (Tuesday, April 29, 1997), pp. C1, C7.

<sup>226</sup>Sutcliff, *On the Track of Ice Age Mammals*, *op. cit.*, pp. 200-201.

nations). Could it be that the list of probable causes is simply a list of things that threaten us as individuals . . . ?

“At the very least, I think we tend to propose extinction mechanisms taken from among the physical and biological factors that are most familiar . . . it constitutes a bias—a conflict of interest.”<sup>227</sup>

What Raup is suggesting is that, since celestial catastrophic events are rare, they tend to play no part in the thinking of most scientists and are excluded, *a priori*, for the more familiar and less violent explanations.

Let us, nevertheless, further examine what is thought to be known regarding these questions, namely, could these large animals have lived above the Arctic Circle for thousands of years at a time when the climate was not as cold as at present, but at a time when these regions were far colder than they are now? That is a rather fundamental datum. We must envisage large animals thriving in an environment much, much colder than anything that exists today in these latitudes for untold thousands of years. Too often the discussions have been based on conditions of the present in the arctic region in relationship to the mammoth and not in relationship to the far colder and more extreme conditions that had to have existed during the Ice Age when it is envisaged that mammoths lived in that environment.

Coming down to ground, David Raup, in this book *Extinction*, points out,

"If a proposed explanation for something passes all tests of plausibility and credibility, is it the correct explanation? Or, if several alternative explanations have been proposed and one is found to be more convincing than any of the others, is that one necessarily correct? My answer to both questions is an emphatic no.

"Something is not proven correct merely because it is shown to be plausible. And that is why circumstantial evidence carries little weight in a criminal court . . . . Many explanations of extinction are based solely on arguments of plausibility, proposing ways the extinction could have occurred. These are often granted the cynical label of Just So Stories, in honor of Rudyard Kipling's yarns about the origin of the elephant's trunk and the tiger's stripe."<sup>228</sup>

Pielou claims "It is worth repeating that the great wave of extinctions at the end of the Pleistocene has yet to be convincingly explained."<sup>229</sup> As with Haynes, who called the

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<sup>227</sup>Raup, *Extinction Bad Genes or Bad Luck*, *op. cit.*, pp. 112-114.

<sup>228</sup>David M. Raup, *Extinction*, (New York, 1991), p. 111.

<sup>229</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 266.

theories of the Pleistocene extinction "fictions," we can see that after this analysis of the "blitzkrieg" and "climate" extinction theories we do not even possess plausibilities to support them but "fictions" and "Just So Stories." And all this is based on thinking about evidence in order to make it fit the doctrine of uniformity.

The worst aspect of these two theories is that they do not fit the facts; rather the facts are manipulated to fit the theories. In essence, no fact or evidence will ever destroy these theories since ad hoc fabricated analysis will always be invented to make (facts) square pegs fit into (theories) round holes. All these auxiliary hypotheses were cooked up to protect the theories from the facts. This, I suggest, is not science.

What has been demonstrated above is that, "the Pleistocene extinctions tell us at least as much about science and scientists as they do about the death of ancient animals."<sup>230</sup>

Grayson comments on Imre Lakatos's work regarding how one distinguishes between scientific theories as either growing or decaying, I believe, aptly describes the nature of the hunting and climate extinction hypothesis.

"Central to Lakatos' analysis is his distinction between 'progressive' and 'degenerating' research programs. Each step of a progressive program increases its empirical content, predicting new facts as it moves along, and seeing those predictions corroborated as time passes. In contrast, degenerating programs are marked by the accretion of ad hoc hypotheses designed to protect the heart of the program [theory] from important inconsistencies, while failing to predict new and unexpected phenomena."<sup>231</sup>

As has been demonstrated repeatedly in these discussions of the hunting and climate extinction theories or programs, a deluge of ad hoc hypotheses are required to protect them. These are well attested to and well-known to both camps of these uniformitarian advocates. Yet, in spite of this, the theorists on both sides refuse to relinquish their defenses and cling to their degenerating programs. As we will further see, the catastrophist program of Immanuel Velikovsky requires little or no ad hoc hypothesis to defend itself but fits the data comfortably.

There is really very little merit in these two extinction theories, since they are largely based on circumstantial evidence, which carries very little weight in law. And in fact, both theories, when tested against solid criteria of evidence fail. What is the most striking thing about these concepts is that they go quite beyond what the actual evidence

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<sup>230</sup>Ronald B. Parker, *The Tenth Muse*, *op. cit.*, p. 168.

<sup>231</sup>Grayson, "Explaining Pleistocene Extinctions," *op. cit.*, p. 821; see also, I. Lakatos, "Falsification and the Methodology of scientific research programs," *The Methodology of Scientific Research Programs*, J. Worrall, G. Currie, ed., (Cambridge, Eng., 1978), pp. 8-110.

shows. They were created to explain the Pleistocene extinction based on an assumption of uniformity and gradualism which I suggest does not apply to the facts.

The past 175 years has been spent in using concepts that grew out of interpreting past events based on various biases and then making the evidence fit these biases. As we proceed further into this discussion, we will see how these have acted as filters, especially the bias of uniformity, to force all the evidence only into that narrow interpretation. Thousands upon thousands of scientists and scholars involved in the research of the past have literally, like the Aristotelian professors and scholars of the ancient classical and medieval world, assumed that their fundamental view of reality is Truth with a capital T. This book suggests that they have not been involved with scientific truth, but with their own human frailty and with scholarly fictions. This is not, from their perspective, a happy nor valid message, but if they are open to truth—evidence—as the only standard by which to determine how the mammoths met their end, then seeing that their favorite theories have failed, they will not dismiss the catastrophic theory with such complete assurance. In reading book after book by these authors, I found they simply said there is no evidence for catastrophism related to this extinction. In symposiums and conferences, they all but ignore it as a possibility. The entire possibility of catastrophism as an answer to the question has been erased from their minds. In spite of this tremendous disregard for this theory, let us look deeper.

In order to create these gradualistic explanations, another myth regarding the Earth was created by science to permit a large array of animals to inhabit the arctic region throughout the Ice Age. I will examine this myth in what follows.

## ARCTIC TUNDRA - MAMMOTH STEPPE OR VELIKOVSKIAN POLESHIFT?

The question to be resolved is: What was the environment in which the mammoths and other megafauna lived? The most recent theory suggests these animals lived in a slightly warmer environment than that of today made up of a mosaic of tundra, tundra forest, and grassland vegetation called a "mammoth steppe." The older theory holds that these fauna lived on tundra and were well adapted to it. Velikovsky's poleshift concept suggests the Ice Age ended with a poleshift which moved the declination of the pole of rotation more perpendicularly to the plane of its orbit. Therefore, the high latitudes in the polar or arctic regions would receive greater light and warmth from solar insolation during the year and the vegetational environment would be that of the temperate zone. That is the issue that will be taken up in this chapter. Was the vegetation of the arctic that of a mosaic mammoth steppe, or an arctic tundra, or that of a much more temperate climate caused by a poleshift when the mammoth lived there? As will be disclosed below, the evidence from the flora and fauna is in complete disagreement with the mammoth steppe concept and also with that of an arctic tundra but in full agreement with a much more temperate climate just as Velikovsky's theory requires. Furthermore, it will be fully demonstrated that the mammoths and other megafauna did not live in northern Europe, Siberia, and Alaska during the Ice Age, but only after it ended, in the period of great warmth known as the Climate Optimum, which ran from about 8,500 to about 3,000 years ago. I shall subsume all the various periods of the Climate Optimum under the term "Hypsithermal," which means the warmest era. Various researchers use different dates for this warm period. Thompson Webb, III, of Brown University, dates the ". . . Hypsithermal period . . . from 8,000 to 4,000 B.P."<sup>232</sup> Others date it somewhat differently. Borisov dates it from "9,000 to 2,500" years ago.<sup>233</sup> Barbara Bell dates the climate optimum from "5000-1000 B.C."<sup>234</sup> According to the *Britannica*, "The Hypsithermal Climatic Interval began about 9,000 years ago and ended about 2,500 years ago."<sup>235</sup> But the figures are rough and a 500 year variation, I believe, is a reasonable deviation.

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<sup>232</sup>Thompson Webb, III, "Holocene Palynology and Climate," *Paleoclimate Analysis and Modeling*, A. D. Hecht, ed., (New York, 1985), p. 188.

<sup>233</sup>P. Borisov, *Can Man Change the Climate*, (Moscow, 1973), p. 35.

<sup>234</sup>Barbara Bell, "Solar Variation," *Climatic Change*, H. Shapley, ed., (Cambridge, Mass., 1960), p. 278.

<sup>235</sup>*Encyclopedia Britannica, Micropedia*, Vol. V, (Chicago, 1982), p. 260.

The major problem confronting all researchers of the megafauna in the arctic region, essentially comes down to the food supply. According to Pielou,

"The fossil record shows that many species of large mammals lived there [in the arctic], for example, among vegetarians, woolly mammoths, mastodon, woodland muskox, western camel, Lambe's horse, and long-horned or steppe bison, all now extinct. Other, still extant, herbivores were also residents: caribou, tundra muskox, wapiti or elk, and Dall's sheep. Preying on them were short-faced bear, American lion, and the sabertooth cat, all now extinct, and the extant grizzly bear, wolf and wolverine. . . . The problem is: How did such large numbers of animals, many of them massive, sustain themselves in the spartan conditions of arctic and subarctic Beringia [Alaska and Siberia]? How did they get enough to eat? Was Beringia truly populated with herds of big game?"<sup>236</sup>

Francis Hitching, in discussing this problem, outlines the two general explanations for the "how" and "why" mammoths could live in the arctic during the Ice Age.

"The trouble with trying to discover the answers is that nobody is emphatically sure what the climate was like in Siberia when the great herds of mammoths roamed the plains there. This leads to two totally different scenarios for what happened to them at their death, one written for warm weather, and one for cold—and infuriatingly, neither quite adds up. It's as if you bought a double-sided jigsaw, one side showing a summer scene and the other winter; no matter which picture you complete, you always have some bits left over—some awkwardly shaped facts [square pegs in round holes] that belong to one side or the other, but not to both."<sup>237</sup>

Let us, therefore, see if we can put the pieces of this enigmatic puzzle together so that there will be no odd pieces left over. In the following analysis, I will first deal with the cold weather theory and then the mammoth steppe theory to determine if either theory is supported by the evidence that mammoths lived in the far north during the Ice Age when it was either warmer or colder there. Then I will explicate the evidence in terms of Velikovsky's poleshift theory.

To give credit where credit is due, Howarth fully understood that large mammoths and other megaherbivores could not have lived on tundra vegetation stating:

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<sup>236</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 147.

<sup>237</sup>Francis Hitching, "The vanished mammoths," *The Mysterious World An Atlas of the Unexplained*, (New York, 1979), p. 52.

"The larger portion of North Siberia is now a naked tundra, on which no tree will grow; swept by terrible icy winds, and covered with moss, sprinkled with a few humble flowers. On such feeding-ground it is physically impossible, as has been said, that elephants and rhinoceroses could exist. They cannot graze close to the ground like oxen. They live on the foliage and small branches of trees, and on juicy canes and long grasses (which grow shoulder-high in the jungles and the beds of African rivers), and would starve on one of our Craver pastures where the grass is close. . . .

"Mammoths' remains have been found [where] there are no trees and no shrubs, but a bare waste; for the greater part of the year with snow, and for three or four weeks furnishing a slight covering of green, while the rivers themselves are for many months frozen hard to the depth of several feet, and everything everywhere is mantled with thick snow.

"When we frankly face these facts, we are constrained to admit with Lyell, 'that it would be impossible for herds of Mammoths and rhinoceroses to subsist at present throughout the year, even in the southern part of Siberia, covered as it is with snow during the winter.'<sup>238</sup>

The situation has not changed one iota from that expressed by Howorth. In fact, it has gotten much worse as deeper research developed. Charles E. Schweger puts the problem this way: ". . . how does one keep a mammoth alive and well under the seemingly impossible conditions of ice-age Beringia?"<sup>239</sup>

Two books of encyclopedic sources have appeared to suggest that the tundra could support the various megaherbivores that are found buried in its frozen soil.<sup>240</sup> In 1937, Eric Hutten showed that Beringia was a huge land mass and claimed no trees grew upon it nor that sufficient grasses grew to support these giant sized animals. In fact, he claimed it was so inhospitable that there was no migration of Siberian or Alaskan forests throughout the Ice Age.<sup>241</sup> On the other hand, geologist J. V. Matthews of the Geological Survey of Canada argued that fossilized insects found in Alaskan deposits sometimes showed grassland beetles which suggested that Beringia may have been a fit environment

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<sup>238</sup>Howorth, *The Mammoth and the Flood*, *op. cit.*, pp. 59-60. F. F. Brandt in 1865, "On the fossil rhinoceros" (in Russian, *Naturalist*, Vol. 15, p. 3 made the same claim that tundra would not sustain giant mammals.

<sup>239</sup>Charles E. Schweger, "Paleoecology of Beringia—A Synthesis," *Paleoecology of Beringia*, D. M. Hopkins, *et al.*, ed., (New York, 1982), p. 319.

<sup>240</sup>D. M. Hopkins, ed., *The Bering Land Bridge*, (Palo Alto, Calif., 1967) and *Paleoecology of Beringia.*, (New York, 1982), David M. Hopkins, J. V. Matthews, Charles E. Schweger, Steven B. Young, eds.

<sup>241</sup>E. Hutten, *Outline of the History of Arctic and Boreal Biota During the Quaternary Period*, (Stockholm, 1937).

for herbivores.<sup>242</sup> To support the view that Ice Age tundra could possibly produce sufficient flora for these herbivores, botanist Lawrence Bliss and James Richards have employed the arctic vegetation as it presently exists and assumed that this is what grew in Siberia and Alaska during the height of the last glaciation around 25,000 years ago. They then assumed that the present number of animals residing on the tundra was the same as at present and attempted to show that this low population of megaherbivores could survive in the arctic.<sup>243</sup> But is it truly possible to produce sufficient, appropriate forage on a tundra for such large mammals even at populations that are quite small?

In order to analyze this question, let us examine the nature of the cold arctic vegetation as it exists today, and compare it with what would have grown there during the Ice Age. The Ice Age arctic, as will be shown below, had a much colder climate than that of today and, therefore, if the present arctic vegetation is meager, that of the Ice Age would have been more so. It is my intention to demonstrate that the mammoths and the rest of the megafauna residing in the far north could never have done so during the Ice Age, but had to live there only after the Ice Age ended. Could the many different herbivores have coexisted on the present tundra throughout the year in these regions? According to Guthrie, the present vegetation will only support a very sparse population and, as we will see, this vegetation will support the large herds of caribou only during the warm summer season. In fall, nearly all but about ten percent of the caribou migrate far to the south to survive the winters of the arctic because:

"Many plants in the boreal forest and tundra are simply unpalatable or even toxic to large mammalian herbivores. Biologists have just begun to understand that that is part of a cycle peculiar to the north. . . . Permanently frozen ground and cold soils tie up nutrients. Plants that can grow in these low-nutrient conditions tend to be tolerant of nutrient stress. They are adapted to rather slow growth and very slow rates of nutrient removal from the soil . . . ; they are conservative and cannot afford to keep reserves stored in underground roots. Thus, most of their biomass is above ground. Plants such as Labrador tea . . . and spruce . . . cannot survive heavy browsing by herbivores because they lack sufficient underground resources to recover quickly. They use nutrients conservatively, allocating some resources to growth and others to toxic chemical defenses. Thus, we may find a six-inch diameter black spruce tree that is a hundred years old. This spruce survived because it produced toxic defenses—terpines and phenolics that made it taste terrible to any passing herbivore venturing a bite. Producing the toxins was effective but costly.

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<sup>242</sup>J. V. Matthews, "Beringia during the late Pleistocene: Arctic-Steppe or discontinuous herb-tundra?" *Geological Survey of Canada Open File Report 649*, (1979); J. V. Matthews "Quaternary vegetation history and the Arctic-Steppe in Beringia," *Proceedings of the 4th International Palynological Conference*, Vol. 3, (1980), pp. 82-91.

<sup>243</sup>L. C. Bliss, "Productivity and nutrient content of tundra ecosystems," *Handbook of Nutrition and Food*, (West Palm Beach, FL, 1981).

"Even dead needles and leaves of these conservative plants are so toxic that decomposers leave them for decades until physical processes begin their breakdown. In a spruce forest or sedge meadow, this toxic plant litter accumulates, forming a thick spongy mat that insulates the soil and inhibits summer thaw. Gradually permafrost creeps upward until it lies just under the mat, summer thaw does not drive very deep. With deeper soils frozen, only shallow soil nutrients are available and nutrients from dead plants recycle slowly because of slow decomposition. Plants living in these conditions must be able to extract nutrients from a shallow, nutrient-poor zone, and for this reason they have a shallow root system. This is why a fallen spruce tree's roots look like a large suction cup or saucer popped off just beneath the surface; there are no tap roots. *The conservative toxic plants that are available to live and grow in these poor, shallow soils are generally not the kind of plants large mammals can eat.*"<sup>244</sup> (Emphasis added)

It becomes rather obvious that all the various mammals that supposedly lived in the arctic during the Ice Age would either starve, become ill, or die from eating such a diet or that if they could somehow adapt to this diet, they would destroy the vegetation that they were dependent upon.

The elephant is notable for its ability to not only chew the scenery, but destroy it in the process.

"Larger herbivores exert a direct impact on vegetation by their consumption of plant parts and by breaking and trampling plants. Plants are damaged by the removal of leaves, bark and other parts, by breakage of branches, which depresses growth, and through being felled or uprooted, causing whole plant mortality. . . .

"African elephants feed on plants by plucking grasses, forbs and creepers, frequently uprooting them; by stripping leaves, fruits, twigs or bark from woody trees and shrubs; by breaking branches off to facilitate consumption of edible parts; and by pushing over or uprooting trees and shrubs."<sup>245</sup>

Lister tells us, "Like living elephants, an adult woolly mammoth of 6 tons needed about 200 lbs. (90kg) of fresh food a day to fuel its great bulk and may have spent 20 hours or more a day feeding."<sup>246</sup> But Caras tells us "An adult elephant will consume up to four hundred pounds of food a day, . . ."<sup>247</sup> or twice the amount Lister has suggested.

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<sup>244</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, pp. 202-204.

<sup>245</sup>Owen-Smith, *Megaherbivores*, *op. cit.*, pp. 226-227.

<sup>246</sup>Lister, *Mammoths*, *op. cit.*, p. 77.

<sup>247</sup>Caras, *Dangerous to Man*, *op. cit.*, p. 79.

The same amount of food would be required by mammoths as pointed out by N. K. Vereschagin and G. F. Baryshnikov who claim that by comparison to modern elephants, a full-sized woolly mammoth would have needed 200 to 300 kilograms or 444 to 660 pounds of rich vegetation a day to live.<sup>248</sup> But elephants also destroy vegetation by their very movement over the terrain, as Ward explains.

"Elephants are much like the dinosaurs of the past. They disrupt plants through their feeding and movement. Each elephant eats enormous quantities each day, but even more deleterious to floral health in any region inhabited by elephants is the effect of their daily marches. Such large animals trample small and even medium sized plants. . . ."249

In no uncertain terms, the fragile vegetation of a tundra would be destroyed in no time by such an onslaught. The floral environment would be depleted in a relatively short time and recovery would take far too long to stop wholesale starvation of the megafauna and their eventual extinction. All organisms live in symbiotic harmony within their habitats, and even if the toxic grasses, etc. were palatable, overgrazing would render the environment a waste, unfit for the megafauna to survive. The next question is: How many large animals can live year round on the arctic tundra? With respect to this question, Guthrie shows:

"It is possible that a tourist driving through Alaska, looking day after day at boreal forest, covering all the major roads in the state, and scanning thousands of square miles may never see a large mammal. Moose are thinly distributed and are limited to habitats where some disturbance breaks this inhospitable substrate, such as a stream that deposits fresh nutrients along its banks every year and keeps permafrost at bay by the relative warmth of water running at nearly freezing temperatures all winter, resulting in well-drained banks and edible willow cover. Fire also has an important role in creating moose habitat. . . . But fires do not usually burn the mossy soil insulation, and before long, more conservative plants are growing up in the cold burn.

"In winter moose cruise the countryside looking for these polka dots of hospitable edibles: some tasty willows on a gravel bar or, two ridges over, a patch of willows growing in a fifteen year old burn. Between these there is little for moose to eat, but likewise *there are no niches open for bison, elk, or horses, especially in the winter. Bison do not live here because there is poor to non-existent summer range and no winter range at all.*

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<sup>248</sup>N. K. Vereshchagin, G. F. Baryshnikov, "Paleoecology of the Mammoth Fauna in Eurasia," *Paleoecology of Beringia*, D. M. Hopkins, *et al.*, eds., (New York, 1982), p. 269.

<sup>249</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 184.

"A large percent of the plant mass in the north is poisonous to most *large mammals*."<sup>250</sup> (Emphasis added)

The point is that bison, elk, and horse lived in these same tundra regions during the Ice Age which will not allow them to subsist today. Bison, of course, are gregarious creatures that will live in large herds. With respect to this type of evidence, Pielou explains:

"The fossil finds suggest a wealth of animal life in ice age Beringia. Mammoth, horse, and bison were everywhere the most abundant. If they resembled their extant relatives, all three were grass eaters and were gregarious. Therefore, if there were big herds of large grazing animals, there must also have been enough forage for them, and it must have been of an appropriate kind. Ordinary tundra vegetation as it exists today would not have been adequate."<sup>251</sup>

But even small herds cannot eat a poisonous diet, and if they could, they would destroy the vegetation. Most significantly, Guthrie goes on to show that "cecal digesters . . . like horses and mammoths . . . do not have rumen [the first stomach of a ruminant] to assist in the detoxification [of plants]."<sup>252</sup>

Ronald B. Parker explains this difference thus:

"The arrangement of the digestive system also affects what a mammal can eat. Ruminants such as bison or pronghorn have several advantages over one-stomached animals such as horses, . . . and elephants. For one thing, the bacterial breakdown of feed in the rumen detoxifies most plant toxins. For another, nitrogen is recycled in the ruminants so that the rumen bacteria are kept healthy and growing even in a shortage of quality feed. The one-stomached mammals, on the other hand, cannot detoxify plants in their digestive system; in fact, THE TOXINS ARE ABSORBED HIGHER IN THEIR [DIGESTIVE] TRACT THAN THE NUTRIENTS."<sup>253</sup> (Capitalization added)

Therefore, mammoths and horses would be poisoned by eating tundra foliage. Even reindeer, adapted to the arctic tundra, cannot consume certain plants that grow

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<sup>250</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, p. 204.

<sup>251</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 149.

<sup>252</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, p. 258.

<sup>253</sup>Parker, *The Tenth Muse*, *op. cit.*, pp. 176-177.

there. Naturalist Clarence Hawkes, who has written over 50 books on natural history, gives a brief sketch of a reindeer fawn learning what to eat and what not to even nibble:

"One of the lessons [the fawn] was to learn [was] what things he might nibble and nose and what to let alone. Brambles and thorn bushes he soon discovered were not to his liking, for their flavor was not good, and they often left a smarting sensation in his nose which was not pleasant. The thistle he also learned to avoid.

"There was a very bright-green-leaved plant that grew on the edge of marshes that he one day investigated. His mother discovered him just in time, and butted him away from it with such ferocity that whenever he saw it afterwards it made him shiver with fear and glance warily at his dam to see if she saw him looking at the hateful plant. Even the nibble or two that he got of the plant before his dam discovered him made him sick for the rest of the day. He drooled and vomited, and had he eaten a few more mouthfuls nothing could have saved him."<sup>254</sup>

Therefore, if reindeer, even with double stomachs, would become sick or die on such vegetation, neither elephants nor horses with single stomachs could survive on such a tundra diet. Krishtalka points out that for mammals:

"At the very least, the bitter taste of the [plant] chemicals repels potential herbivores. At worst the toxic . . . [chemicals] in plants can produce intestinal, kidney and liver damage, anemia, reduced fertility, cardiac instability, circulatory failure, genetic mutations, cancerous lesions and death."<sup>255</sup>

What, then, of summer forage? Is there really enough flora to support a varied herbivore population? The point is that even summer forage cannot be highly grazed today and those animals that do eat it require immense territory to range across in the summer arctic. As Stonehouse explains:

"Caribou herds number anything up to 300,000 animals and range over enormous areas. The 'Arctic' herd is one of the thirteen designated herds in Alaska, is thought to contain a quarter of a million animals ranging over 360,000 km<sup>2</sup> (140,000 square miles) of tundra. . . . These huge grazing areas are needed because tundra regenerates slowly after grazing. Attempts to constrain the

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<sup>254</sup>Clarence Hawkes, "Little Lightfoot," in Sanderson, *Animal Tales*, (New York, 1946), p. 116.

<sup>255</sup>Krishtalka, *Dinosaur Plots*, *op. cit.*, p. 174.

caribou or restrict their movement are likely to cause local over-grazing and long term damage."<sup>256</sup>

Richard Perry explains: "If over-grazed or over-trampled a sward of lichen requires between thirty and forty years to regenerate into caribou pasture from ½ to 1-¾ inches long."<sup>257</sup>

Barry Lopez shows that a "pile of caribou droppings may take thirty years to remineralize on the calving grounds."<sup>258</sup>

This fact is tied in with a fundamental ecological problem, namely the specialized feeding niches of herbivores. Herbivores inhabiting the same area each have different feeding niches and thus each eats specialized types of vegetation; otherwise, the competition would drive one of the species competing for the same food niche to extinction. As Paul Colinvaux explains:

"It has long been recognized that the many grazing animals of the African game herds must be specializing in food. . . . All eat different bits of that immense pasture which is the savanna. Zebra take the long dry stems of grasses, . . . Wildebeest take the side shoots . . . Thompson's gazelles graze where others have been before, picking out ground-hugging plants and other tidbits that the feeding methods of the others have both overlooked and left in view. Although these and other big game animals wander on the same patches of country, they clearly avoid competition by specializing in the kinds of food energy they take."<sup>259</sup>

However, we are told by Stonehouse that the "Arctic plants are few and small and there is less variety of species than in warmer climates."<sup>260</sup> And with so much less variety of land plants, "Arctic tundra supports . . . over 40 species of land mammals, ranging in size from mice to musk-oxen."<sup>261</sup> That is, the musk-ox is the largest herbivore living year round on the tundra. When we realize that there were several herbivores much larger than the musk-ox living with it in the past, it becomes clear that tundra will not support such a population.

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<sup>256</sup>Bernard Stonehouse, *North Pole South Pole*, (London, 1990), p. 95.

<sup>257</sup>Richard Perry, *The Polar Worlds*, (New York, 1973), p. 263.

<sup>258</sup>Barry Lopez, *Arctic Dreams*, (New York 1986), p. 154.

<sup>259</sup>Paul Colinvaux, *Why Big Fierce Animals Are Rare*, Princeton, (N. J. 1978), pp. 148-149.

<sup>260</sup>Stonehouse, *North Pole South Pole*, *op. cit.*, p. 87.

<sup>261</sup>*Ibid.*, p. 91.

The point that must be emphasized is that most of the mammals that live year round in the arctic today are predominantly small ones. We are specifically informed that presently, "tundras support a considerable variety of animal life. The vertebrate herbivores consist primarily of microtine [very small] mammals."<sup>262</sup> That is, today, there are only a very few species of large, herbivorous mammals that can live in the arctic basin year round, and the most populous, the caribou, in overwhelming numbers, still must migrate several hundred miles south to survive the winter season. But advocates of the concept of mammoths in the arctic during the Ice Age suggest an even larger number of different mammals, larger in size than reindeer and musk-oxen, lived there with caribou and musk-oxen. Yet the same form of specialized feeding described for the African savanna must also apply to them. Kurten enlarges on this concept:

"The modern tundra . . . is very monotonous. *Enormous tracts are covered by much the same sparse vegetation.* On the other hand, the great plant-eaters of the mammoth steppe were dependent on a varied spectrum of food plants. Horse tend to specialize in medium-level grass stems with fairly low protein content. Bison also need a high fraction of grass sheaths and leaves. Sheep prefer new growth of high-quality herbs. Musk oxen feed on low deciduous shrubs. Mammoths probably fed on herbaceous vegetation in a rather selective manner, but needed copious amounts of it. . . . All these animals with their varied appetites could not have coexisted on the modern tundra. They would require a more varied environment which they could partition according to preference."<sup>263</sup> (Emphasis added)

To assume that on such a limited tundra forage the arctic could support so many more different animals, many larger than those living on the tundra today, grazing and browsing this highly reduced, toxic floral diet, is simply not credible. There would have had to have been far fewer mammals and much smaller ones than today to subsist on such a limited amount of forage. Add to this even more highly toxic plants in a colder environment, and the overgrazing of what was edible must ensue. It is unrealistic to presume anything large could have lived there. The concept, based on these kinds of evidence, is simply not supportable. The animals of Alaska could not migrate south because this route was blocked by thousands of miles of an immense ice cap.

Lister also concluded: "Today's tundra is slow growing and poor in nutrients, and is capable of supporting only limited numbers of specialized mammals feeding on lichen and moss, such as reindeer and musk oxen. The forests, on the other hand, support tree-

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<sup>262</sup>"Tundra," *McGraw Hill Encycl. of Sci. and Tech.*, 6th ed., (New York, 1987), p. 592.

<sup>263</sup>Kurten, *Before the Indians*, *op. cit.*, p. 142.

browsers such as the moose. Neither of these habitats was suitable for mammoths and other grazing beasts, which were adapted to grasses and other herbaceous plants."<sup>264</sup>

The reason for this has to do with the very nature of soil. According to Colinvaux:

"The soil of one place [climate zone] is as obviously different from another as a pine tree is different from an oak.

"Dig a pit in the wet tropics and the sides show red, dig it in middle Europe and they are brown. In the vast conifer forests of southern Russia or Canada the sides of the hole are striped with extraordinary colors. . . . It takes no scientific knowledge to see that this oddly striped ground is very different from the brown and red earths of more southern climes. North of the [American or Eurasian] treeline, the striped ground is left behind and beneath one's probing space is found a ringing block of ice covered by a thinnish mat of sodden humus, tundra soil."<sup>265</sup>

What is quite important in terms of the nutrient value of a soil to a large herbivorous mammal is related to the amount of humus that exists in it.

"Understanding the nutrient reservoir of a living temperate forest gives the answer. . . . In the temperate forest . . . there are three reservoirs of nutrients. . . . The first reservoir is . . . in the living plants themselves, but this is only a small part of the total. The other two parts are held in the soil humus and in the curious complex clay minerals of colder soils.

"The usefulness of soil humus is obvious, and so is the reason for its existence. In the colder northern regions, with their freezing winters, the process of rotting [to create humus] is much hindered, so the more resistant parts of dead plants last a long time. They yield to the soil water the nutrients that went back into their making only grudgingly and this trickle can be captured by root-systems that are a good deal less efficient than those of tropical trees. . . . Furthermore the chemistry of humus is such that nutrients such as nitrates and phosphates, those that are negatively charged [electrically], actually collect on the humus particles being dragged out of the soil-water by an inanimate chemical process. So one of the reasons that temperate agriculture works is that the cool climate lets humus collect, and the humus acts as a passive non-living regulator of the nutrient supply."<sup>266</sup>

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<sup>264</sup>Lister, Bahn, *Mammoths*, *op. cit.*, pp. 132-133.

<sup>265</sup>Colinvaux, *Why Big Fierce Animals are Rare*, *op. cit.*, p. 52.

<sup>266</sup>*Ibid.*, pp. 77-78.

Lopez explains that, "Arctic soils are thin, acidic, poorly drained, and poorly aerated. They are rich in neither nitrogen nor the phosphorus essential for plant growth."<sup>267</sup>

Therefore, what would happen to herbivores that ate vegetation from a soil underlain by permafrost as found in tundra? According to François Bourlière, phosphates in soil play a major role.

"Even for ungulates [hoofed herbivores] the soil may constitute an important factor in limiting their geographical distribution. Essential minerals may be insufficient or lacking altogether in some soils, with the result that the deficiency diseases cause the rarity or even extinction of particular species in certain localities. Domestic cattle furnish good examples of this. When the soil of a region where they are raised is too poor in phosphoric acid and calcium phosphate, disorders due to phosphoric deficiency appear (called aphosphorose), indicated by such symptoms as perversion of the appetite with tendencies toward bone eating, abnormalities in gait, broken bones that are spontaneous or caused by the slightest impact, sexual apathy and disturbances of the oestrus cycle and so on."<sup>268</sup>

What, then, occurs to animals presently that live on the tundra? According to R. J. Putnam,

"By feeding on plant materials, animals lock up within their tissues essential nutrients making them unavailable to the next 'generation' of plants. In systems where nutrients are relatively abundant, and there exist in the soil a relatively large pool of 'free' nutrients [as in a temperate forest or grassland soil] this has but little effect upon plant growth, but in other nutrient-poor systems, the effect of having significant quantities of a limited nutrient supply bound up in animal tissue may well be quite marked. In the tundra zone of Alaska, for example, lemmings in years of peak abundance, may consume 40% of the available nitrogen and 50% of the phosphorous. Although ultimately all this is returned to the soil—nutrient pool in the form of animal wastes (in feces or as carcasses), there is a considerable time delay and for some period the vegetation becomes markedly nutrient-impooverished."<sup>269</sup>

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<sup>267</sup>Lopez, *Arctic Dreams*, *op. cit.*, p. 23.

<sup>268</sup>François Bourlière, *The Natural History of Mammals*, (New York, 1964), pp. 268-269.

<sup>269</sup>R. J. Putnam, *Grazing in Temperate Ecosystems Large Herbivores and the Ecology of the New Forest*, (London, 1986), p. 6.

Putnam goes on to show that after the lemming population swells during the period when the soil is enriched, they deplete the nutrients to the extent where they literally starve to death.

Stonehouse describes the lemming feast-famine cycle thus:

"Lemmings which are herbivores the size of small rats, seem especially well adapted to tundra life. Wintering in the warmth and protection of snow burrows, in favourable conditions they breed almost continuously, producing four or five litters per year, each of up to six young. Two or three years of such fecundity, over a large area can cause a population explosion. . . .

"Eventually when the lemmings have eaten out their local food supply [which cannot replenish itself], the population rapidly collapses. A few migrate successfully but most die of stress, starvation or [deficiency] disease."<sup>270</sup>

With respect to lemming migration, it should be pointed out that,

". . . lemmings may produce 4 or 5 litters—often more than 25 offspring—in a year. When their number soar and starvation threatens local populations, lemmings instinctively begin huge migrations across the frozen lands. Contrary to legends, they do not commit suicide by flinging themselves off cliffs into the sea. They do, however, travel en masse [driven by starvation] in search of food, stopping at nothing. Thousands die crossing lakes or bogs, and often there are few survivors."<sup>271</sup>

One aspect of the problem that is rarely discussed is how mammoths could survive through the winter. For example, speaking of the musk ox Flannery states, "Like all northern animals, it must eat enough during the summer to survive right through the long winter nights on the body fat it accumulates."<sup>272</sup> Mammoths, like all elephants, must eat every day, and, therefore, could never accumulate sufficient body fat to survive the arctic winter.

Mammoths and all the other megaherbivores, which would consume inordinate amounts of vegetation compared to lemmings, could not have lived in the tundra, nor could mammals of the temperate zone, such as bison, horse, or deer have done so. All the evidence of ecology points unambiguously to this fact. The plants are poisonous or

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<sup>270</sup>Stonehouse, *North Pole South Pole*, *op. cit.*, p. 9\_

<sup>271</sup>Susan Arritt, *Deserts*, (Pleasantville, N.Y., 1993), pp. 88-90.

<sup>272</sup>Flannery, *The Eternal Frontier*, *op. cit.*, p. 167.

unpalatable because they cannot put down deep roots in the tundra. The variety of different plants required to support a large, varied population of herbivores is lacking. Even if the herbivores did somehow manage to eat this flora and survive, the flora could not survive this foraging. The nutrient value of tundra flora is extraordinarily poor and would have led to deficiency diseases or death to the grazers, or the grazers would have had to eat much more of it to live, which would have hastened the destruction of the food source. Those who hold the view that tundra vegetation would support the mammoth and all the various other megafauna herbivores are simply being irrational. Several authorities cited above all say tundra will not support ancient mammal populations.

The mammoth, like other elephants, has to eat almost every day a great amount of vegetation to live. It cannot subsist for months at a time on almost nothing or truly nothing. Northern grazing animals tend to put on as much fat as possible during the spring, summer, and fall seasons to carry them through the harsh northern winters.

Elephants eat about twenty hours a day to live. They do not put on enormous amounts of fat during the warmer seasons to carry them through the winter. They encounter such problems only when they destroy the vegetative environment and then they suffer high mortality rates. Drought causes the same problem. In the arctic, they would starve each winter and die before it ended.

As pointed out above, Charles Lyell posited the idea that mammoths could migrate from the Siberian tundra to escape the months of darkness above the Arctic Circle and the cruel winter temperatures. In his *Principles of Geology*, however, he realized that this concept was in stark contradiction to the facts:

" . . . we may infer, that the climate was milder then . . . because, in Northern Russia, where their bones are found in immense numbers, it would be difficult if not impossible, for such animals to obtain subsistence at present during an arctic winter. It has been said, that as the modern northern animals migrate, the Siberian elephant may also have shifted his place during the inclemency of the season, but this conjecture seems forced, even in regard to the elephant, and still more so, when applied to the Siberian rhinoceros, found in the frozen gravel of that country; as animals of this genus are heavy and slow in their motions, and can hardly be supposed to have accomplished great periodical migrations to southern latitudes. That the mammoth, however, continued for a long time to exist in Siberia after the winters had become extremely cold, is demonstrable, since their bones are found in icebergs, and in the frozen gravel, in such abundance as could only have been supplied by many successive generations. So many skeletons could not have belonged to herds which lived at one time in the district, even if those northern countries had once been clothed with vegetation as luxuriant as that of an Indian jungle. But, *if we suppose* the change to have been extremely slow, and to have consisted, not so much in *a diminution of the mean annual temperature*, as in an alteration from what has been termed an 'insular' to an 'excessive' climate *from one in which the temperature of winter and summer were [more] nearly equalized to one wherein*

*the seasons were violently contrasted, we may, perhaps, explain the phenomena.*"<sup>273</sup> (Emphasis added)

What Lyell was hypothesizing was that during the Ice Age the temperature of Siberia, Northern Europe, and North America was cooler in summer, but, more importantly, warmer in winter (the temperatures . . . "were nearly equalized") and that subsequently the climate became violently extreme after the mammoths became extinct. Lyell was inventing a moderate climate to support the supposition that mammoths could live in Siberia during the long, dark winter season.

This was completely understood by Georges Cuvier who earlier understood, as did Lyell, that "this eternal frost did not previously exist in those parts in which the animals were frozen, for they could not have survived in such a temperature"<sup>274</sup>

Ivan T. Sanderson explains that in Alaska, mammoths could not have migrated. "Nevertheless, it is possible that mammoths migrated south in the fall and back again . . . in the late spring, *in Siberia*. But what of those in Alaska, for they were cut off by the sea on three sides and by a solid montane icecap on the fourth."<sup>275</sup> It is not reasonable to presume that elephants climbed the icecap every summer to cross it to get to Alaska and then to recross it every fall to escape the bitter winters. Sanderson further points out that, "they could not go south down the Yukon coast because even today, the glaciers come right down to the sea along the coast."<sup>276</sup> Therefore, if the mammoths in Alaska did not migrate, then those of Siberia had to live in a temperate-like environment that supplied them with abundant foliage all year round. Again, as with Lyell, this requires a special environment during the Ice Age.

But what about caribou in North America, the same species as the reindeer in Europe, or the American moose, the same species as the European elk.<sup>277</sup> Could these animals live in Alaska and not migrate? These animals must, in fact, migrate. They, too, lived in Alaska with the mammoth.

"The caribou herds, moving southwards across the Alaskan tundra in September, are fat and in good condition after a summer of feeding . . . they [and their young] have a long journey ahead of them . . . [when] the weather is worsening . . . As the need to reach [more southerly] shelter grows more urgent, they may travel as much as 60 kilometers [48 miles] in a single day.

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<sup>273</sup>Charles Lyell, *Principles of Geology*, 1st ed., reprint, Vol. I, (Chicago, 1970), pp 96-97.

<sup>274</sup>Georges Cuvier, *Revolutions and Catastrophes in the History of the Earth*, (1829) cited in Graham Hancock, *Fingerprints of the Gods*, (New York, 1995), p. 215.

<sup>275</sup>Ivan T. Sanderson, *The Dynasty of Abu*, *op. cit.*, p. 83.

<sup>276</sup>*Ibid.*

<sup>277</sup>David Attenborough, *The Living Planet*, (Boston, 1984), p. 72.

"At last, after a week or so of persistent walking, the herd reaches the first trees. They are stunted and gnarled and stand singly or in small groups in sheltered folds of the land. Still the caribou continue south. Slowly the trees increase in size and number. Eventually, after a march that may have taken them across 1,000 kilometers [620 miles], the herd moves through tall trees and into real forest."<sup>278</sup>

We often assume that all the animals that are seen on the tundra in summer live there throughout the year. But the fact of the matter is, this is not true for seven well-known, moderately sized species as Stonehouse informs us. "Coyotes, otters, lynxes, porcupines, wolverines, red foxes, muskrats, and snowshoe hares commute between winter [taiga] forest and summer tundra."<sup>279</sup> The point is that tundra will presently only support a very small population of large animals year round. The vast majority of species that subsist on tundra today are extremely small animals such as "varying hares. . . . Eight species of shrew, nine species of vole and three species of lemming. . . ." <sup>280</sup> They live in winter under the snow where it is warmer than in the open air.

Under present-day conditions, the tundra could never support a population of grazing megaherbivores. It simply is not possible! This we have been told by all the researchers above. Yes, herds of about a thousand constantly wandering Barren Ground Caribou and herds of a dozen or so musk-ox can live year round on the tundra, but the ninety percent of other caribou and the majority of large and moderately sized species simply cannot do so; that is why they migrate.

There are basic problems further related to large megaherbivores living on the tundra year round. About ten percent of the caribou do not migrate and they represent a few hundred thousand, at best. This will be examined below. According to Tudge, certain

". . . outstanding biological features militate against big animals. First . . . the importance of which can hardly be overstated [is] population. Animal populations need to be big if they are to be viable in the long term. Populations smaller than a few hundred seem almost bound to go extinct in centuries if not in decades through physical accidents such as epidemic or statistical accident such as a skewed sex ratio; and in the longer term, lack of genetic variation will prevent their further adaptation when conditions change. *In reality 'a few hundred may mean several thousand.* (Emphasis added) Thus Tom Foose, when he was with the World Conservation Union, calculated that unless wild populations of black rhinoceroses contain at least 2,500 individuals, they are liable to go extinct. A population that size requires vast undisturbed space: on

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<sup>278</sup>*Ibid.*, p. 67.

<sup>279</sup>Stonehouse, *North Pole South Pole*, *op. cit.*, p. 99.

<sup>280</sup>*Ibid.*

normal territory perhaps up to 25,000 square kilometers [15,700 square miles]. Just a little disturbance here and there can reduce the effective size of the territory below the size needed to support viable numbers.

"[Furthermore] . . . large animals are generally reproductive K-strategists: that is, they produce only one or two offspring at a time, and only at longish intervals, in the expectation that most will survive. They stand in contrast with r-strategists, like mice and flies, which produce big or even vast litters at short intervals, in the expectation that only a few will live. K strategy reproduction is commonly associated with slow maturity and a long life."<sup>281</sup>

An excellent example of how this works was presented by Raup regarding the heath hen.

"In colonial America the heath hen was edible, easy to kill, and abundant over much of the eastern seaboard, . . . . Intensive hunting, coupled with habitat destruction by an expanding population, gradually reduced the heath hen's geographic range. By 1840, they were limited to Long Island, parts of Pennsylvania, New Jersey, and a few other places. From 1870 on, they existed only on the island of Martha's Vineyard, off the coast of Massachusetts. . . . [In] 1908 a 1,600-acre refuge was established to protect the remaining fifty birds.

"Following this protection, the population . . . grew steadily. . . . Hunting had long been forbidden, and the refuge was protected by fire control. . . .

"Then starting in 1916, a series of mostly natural events led to the final extinction. These were (1) a natural fire . . . that destroyed much of the breeding area; (2) a hard winter immediately following the fire, and (coincidentally) accompanied by an unusual influx of predatory goshawks; (3) inbreeding, caused by the reduced population size and the accident of a distorted sex ratio; and (4) a poultry disease introduced from domestic turkeys that killed a substantial number of the remaining birds. By 1927, only eleven males and two females were left. By the end of 1928, only one bird remained. It was last seen on March 11, 1932."<sup>282</sup>

Lopez adds to this that

"In addition, the northerly ecosystems regularly experience severe biological disturbances related to normal weather patterns. . . . Arctic climatic patterns are further characterized by unpredictable and violent weather. . . .

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<sup>281</sup>Tudge, *The Time Before History*, *op. cit.*, pp. 304-305.

<sup>282</sup>Raup, *Extinction*, *op. cit.*, pp. 121-122.

"The size of the population often changes dramatically, as a matter of course; the violent weather typical of early and late summer routinely wreaks havoc on some arctic populations, particularly those of warm-blooded animals."<sup>283</sup>

Therefore, if the various populations of animals in the far north were extremely small, over a short period of time they would simply go the way of the heath hen. According to Raup, there is a "minimum viable population" and "populations below this point [are] likely to go extinct very quickly."<sup>284</sup>

This becomes especially important with respect to carnivores that preyed on the herbivore populations. There are always many fewer carnivores in an environment than the herbivore animals they hunt. There is a food pyramid with plants at the base having the greatest biomass. The herbivores that feed on this vegetation do not eat all of it, and lose energy in the process of obtaining and assimilating it. Thus, they have a much smaller biomass or population compared to plants. The carnivores that eat the herbivores are even fewer in number for the same reason. Therefore, if the mammalian herbivore populations of Beringia were small, in order to survive on the very limited vegetation available, the carnivores such as saber-toothed lions, etc., would have to have much, much smaller populations of herbivores to prey on. But this would place them in dire circumstances and they would be subject to all the vicissitudes experienced by the heath hen, and in short order would go extinct. The basics of ecology indicate that the various populations of mammals living together in the far north could not be small based on this well understood phenomenon.

Presently "As many as 2 million . . . [caribou] trek hundreds of miles each year between winter range . . . calving grounds on the tundra. . ." <sup>285</sup> in Canada and Alaska. Taking ancient Beringia as comparable in its northern expanse to North America, then a similar number, or perhaps double this number, would have existed then.

Now, let us assume that the Beringia tundra could support a population of five million caribou year round. According to Sanderson, "The caribou or reindeer in this wild state weighs from one hundred and thirty to one hundred and fifty pounds for barren ground species. . . ." <sup>286</sup> With full sized mammoths weighing 13,600 pounds on average, <sup>287</sup> ninety caribou would equal one mammoth. That means, if we were to convert a mass of barren-ground caribou that live on the tundra all year to mammoths, then about 55,500 mammoths lived on the tundra. But then comes the problem of finding population

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<sup>283</sup>Lopez, *Arctic Dreams*, *op. cit.*, pp. 27-28.

<sup>284</sup>*Ibid.*, p. 124.

<sup>285</sup>Lopez, *Arctic Dreams*, *op. cit.*, p. 151.

<sup>286</sup>Ivan T. Sanderson, *Animal Tales*, (New York, 1946), p. 109.

<sup>287</sup>Lister, *Mammoths*, *op. cit.*, p. 68.

space for all the other large herbivore mammals which must then lower the mammoth numbers. We must still make space for the woolly rhinoceros, horse, super bison, bison, saiga, antelope, Dall sheep, musk ox and others of smaller size. Each of these animals in turn have to have a large enough population to prevent their extinction. These various species all residing on the ancient tundra would each have very tiny populations spread across the vast Beringian land area, which is more than five times the area of Alaska. The various species would be spread so thinly over this immense region that they could not remain viable. The same must apply even if ten or even twenty million caribou lived year round on the tundra. Ten million caribou would equal about 111,000 mammoths, twenty million would equal only about 222,000 mammoths. By making space available for all the other herbivores, these numbers would be reduced to a small fraction of these values.

The populations sufficiently large for all these herbivores to survive would still require much larger numbers for each population. If presently, Alaska is a vast area with extremely few large animals living on the tundra year round, it could not support a greater variety of species and greatly larger ones during the Ice Age. Based on all the ecological evidence cited above, this is simply not a viable population scenario. That is, by making the population of each species small enough to somehow subsist on a vast tundra, we run up against the fact that they will become extinct by the vagaries of existence.

Caribou presently have to migrate south. But during the Ice Age in Alaska, when the winters had to be even colder, like the mammoths in Alaska, they would have had to migrate perhaps 2,000 kilometers (1,240) miles and would have had to do so going across the continental ice cap, a completely unreal concept. Guthrie points out that "during glacial maxima, mammoths would have to go all the way from Alaska to Montana over several thousand miles of glaciers."<sup>288</sup> But caribou, which must presently migrate, could not have done so, and thus this absolutely demands a mild climate in order for them to live in this region during the harsher Ice Age. This is a clear contradiction to the cold arctic concept.

But there is a further obstacle to mammoths migrating over long distances in short time periods. According to Guthrie,

"However, the several-thousand-mile winter migrations of mammoth are not very probable. Mammoths had heavy graviportal, distally muscled legs, and they required much more energy to walk than other mammals. Robert White (personal communication) has calculated that, at lean weight, it takes a proboscidean, such as a mammoth, twice the energy to walk or stand. In more gracile ungulates, such as caribou, however, walking requires only 20% increase in energy over standing."<sup>289</sup>

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<sup>288</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, p. 247.

<sup>289</sup>*Ibid.*, pp. 246-247.

What Lyell suggested over 100 years ago was ignored for that same 100 or more years until uniformitarians finally understood a colder arctic environment would not be ecologically salubrious for large herbivore mammals. Therefore, Lyell's concept was dusted off and refashioned to create an environment that is totally different from anything known that exists today or at any other time. The thesis of a warm arctic was developed by R. Dale Guthrie.<sup>290</sup>

What Guthrie has done is look at the large numbers of grazing type mammals that inhabited the far north and, realizing that grazers must eat a great deal of the time to derive sufficient nutrition from vegetation, he was driven to suggest that in order to live in the arctic, the region had to be as productive as the vast grasslands that presently exist in such places as the central United States, the steppes of Europe, such as the Ukraine, and Mongolia in Asia. In essence, what Guthrie did to supply the herbivores with enough food was to move the steppe grasslands away from their present southern locations up into the arctic basin, *during the Ice Age!* He said the arctic was warmer during the Ice Age.

As we noted earlier, the tundra supports populations of many mammals (mostly caribou) during the summer and extremely few during the winter. It is a well-known principle of ecology that animal populations will grow to the greatest extent or number to which their environment or biome will allow.<sup>291</sup> Since there are far fewer grazing species living on the tundra today, it follows that to have a larger number of grazing species in the past, the arctic basin had to grow much more vegetation and a greater variety of plant species to allow for each grazer's ecological niche.

Chadwick describes Guthrie's work as it relates to the problem of megaherbivores finding appropriate and sufficient forage.

"Ice Age experts Dale and Mary Lee Guthrie have presented evidence that with so much available water locked up within the ice pack much of the subarctic region not covered by glaciers was drier than it is today. As a result, its soils thawed to a greater depth and supported rich plant communities. They included a lot of nutritious grasses where only low, slow-growing, tougher tundra vegetation with bitter chemicals for defense against grazing are found today. According to the Guthries, the greater variety and nutrition offered by steppe

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<sup>290</sup>R. Dale Guthrie, "Paleontology of the large mammal communities in interior Alaska during the Pleistocene," *American Midland Naturalist*, Vol. 79, (1968), pp. 346-363; and "Mammals of the mammoth steppe as a paleoenvironmental indicator," in *The Paleoecology of Beringia*, D. M. Hopkins, *et al.*, eds., (New York, 1982), pp. 307-326; and "Woolly arguments against the mammoth steppe—A new look at the palynological data," *Quarterly Review of Archaeology*, Vol. 6, (1985), pp. 9-16; and *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, pp. 226-272.

<sup>291</sup>Owen-Smith, *Megaherbivores*, *op. cit.*, p. 293.

habitats during the Pleistocene go a long way toward explaining how grazing mammals could attain such great size and abundance in subarctic pastures."<sup>292</sup>

Grayson sums up the concept thus:

"Guthrie counted the number of animals from these [northern arctic] sites and observed that the ratio of grazing grass eaters to non-grazing ungulates was at least 20 to 1, whereas in the same area today, the ratio is on the order of 1 to 100. From this, Guthrie concluded that interior Alaska must have supported a productive grassland during the Wisconsin glaciation.

"This hypothesized productive grassland, with its mammoth, horses, and bison, has come to be called the 'mammoth steppe,' not only for its postulated size, but also for one of its most characteristic animals. Guthrie argues that the mammoth steppe covered virtually all of Wisconsin [Ice]-aged Beringia, and extended well across Eurasia.

"Guthrie's thoughtful analyses of the paleontological faunas from Beringian sites have led him to speculate about many of the details of this biome . . . he infers that although the winters of Alaskan Beringia might have been cold, they must also have been marked by light, frequently wind-swept, snows many of the grazers had large antlers, tusks, and horns; Guthrie infers from this that the growing season must have been long. The longer the growing season, he argues, the bigger the body parts can become. Hence, he suggests that the cold winters of the mammoth steppe were short hemmed in on one side by late and moderately warm autumns and on the other side by early springs and attendant early thaws.

"Guthrie's Wisconsin-aged Beringia is thus fairly lush, with high densities of huge grazing mammals that had to contend with cold but short winters, and that fed on abundant grasses fostered by a long growing season."<sup>293</sup>

Pielou presents the uniformitarian hypothesis thus:

"Arctic steppe is assumed to have been a form of vegetation combining the qualities of modern steppe . . . [grassland] and arctic tundra. . . . The chief argument in favor of the arctic steppe hypothesis is that *it must have existed* if herds of all these animals were able to survive in the [arctic] region."<sup>294</sup>  
(Emphasis added)

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<sup>292</sup>Douglas H. Chadwick, *The Fate of the Elephants*, *op. cit.*, p. 27.

<sup>293</sup>Donald K. Grayson, *The Desert's Past*, *op. cit.*, p. 49.

<sup>294</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 150.

Put into more basic terms, the concept of this grassland steppe is as Pielou states, *assumed* to have existed, and the reason or chief argument for it is that *it must have existed!* In order to have the mammoths and other mammals living in the arctic region during the Ice Age, the scientists of today, just like Lyell, have invented an environment never known to have existed except in their minds and their hypotheses. Because it became necessary for some such environment to exist in order that grazing ungulates could thrive in the arctic, several notable authorities have jumped on the bandwagon to throw their support to this mammoth steppe hypothesis.

Anthony J. Sutcliffe, curator of Pleistocene Mammals at the British Museum of Natural History, explains why he supports this mammoth steppe hypothesis:

"Well preserved stomach contents have been recovered from a number of frozen mammoths, among the most important being the Beresovka and Shandrin, mammoths, . . . The stomach remains from both mammoths were separately examined for fruits, fragments of stems and leaves; and for pollen and spores. In both instances, it was found that herbs and herbaceous, pollen and spores make up the bulk of the material, with *parts of trees*, and arboreal pollen only sparsely represented. Macroscopic plant remains from the Beresovka mammoth include predominantly grasses and sedge, with rare buttercup, poppy and other herbs. *In addition, fragments of bark of larch, birch and alder were beneath the carcass.* Macroscopic remains from Shandrin mammoth included abundant mosses and *sphagnum* together with occasional *woody fragments of bilberry and willow and needles of larch.* . . . (Emphasis added)

"From this botanical evidence, several ecological plant assemblages are recognized, suggesting that the mammoths' habitat was very varied. There are plants characteristic of a dry steppe-like environment, others of slightly wet conditions, others of swampy conditions, and a few arctic-alpine plants. The habitat of the mammoth was apparently most typically meadow-like with swampy areas and more sparsely growing trees; its diet was predominantly of grasses and sedges with some other herbs and mosses and occasional parts of trees. . . .

". . . there existed across three continents from Europe to Canada, a cold steppe-like biome variously known as 'mammoth steppe,' 'arctic steppe,' and 'steppe tundra.' It was characterized by succulent, grasses and abundant *Artemisia* (wormwood) and became extinct, except for some local patches at the beginning of the Holocene about 9-8000 years ago."<sup>295</sup>

Scientists have found in the stomachs of some mammoths partly digested vegetation that was rich and lush upon which the mammoths could subsist. However, animal and elephant diets are variable from season to season according to the foliage

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<sup>295</sup>Sutcliffe, *On the Track of Ice Age Mammals, op. cit.*, p. 115.

available<sup>296</sup> and, therefore, it is wrong to suggest that one can know the whole environment accurately from just two such findings. As Shipman, in her study of taphonomy and paleoecology, points out:

"Studies of living species reveal that animals possess remarkable plasticity in their . . . feeding . . . behavior. For example, even species showing marked adaptations to particular diets . . . vary their behavior in response to minor habitat differences or, apparently to whim. Thus we can look for major functional adaptations . . . to diets dominated by one type of food . . . . However, even if we can identify such complexes of adaptations, we must assume that the animals of the past were probably capable of considerable but unmeasurable plasticity in behavior. . . . AT PRESENT, PALEOECOLOGISTS ARE SIMPLY UNABLE TO DEFINE THE NICHE OF AN EXTINCT SPECIES WITH ANY PRECISION. A major, recent breakthrough is the discovery that an animal's predominant diet, broadly defined, in the last few months before death can be determined by inspecting the wear on its teeth with a scanning electron microscope. . . . ALTHOUGH SUCH WORK PROVIDES INVALUABLE EVIDENCE ABOUT ANCIENT DIETS, IT IS STILL FAR FROM AN ACCURATE REPRESENTATION OF THE RANGE AND VARIABILITY OF THE DIET OF ANY INDIVIDUAL."<sup>297</sup> (Capitalization added)

As Lopez points out,

"For a long time it was thought that the muskox diet was simple. Now it is known that they consume a great variety of flowering plants, grasses, sedges, mosses, and forbs—bluegrass and willow herb, bladder campion and foxtail, cow berry, mountain sorrel, and Labrador tea. Their diet varies with the season according to where they are, and according to their idiosyncratic needs and tastes."<sup>298</sup>

Sutcliffe merely characterized this environmental climate contrary to other possible dietary materials that may have been available in other seasons to the mammoth to suggest that,

"Although the climate was very cold, the sea would have been much lower at this time, causing the whole of the Bering area and shores of the Arctic Ocean to become dry land with consequently greater aridity lighter winter snow cover, deeper seasonal melting of the permafrost, a longer growing season for

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<sup>296</sup>Haynes, *Mammoths, Mastodons & Elephants*, *op. cit.*, p. 89.

<sup>297</sup>Shipman, *Life History of a Fossil*, *op. cit.*, pp. 193-196.

<sup>298</sup>Lopez, *Arctic Dreams*, *op. cit.*, pp. 62-63.

plants and *deeper root penetration*. The consequence (*a conclusion also borne out by evidence from fossil insects associated with some of the mammoths*) was the development of widespread areas of cold steppe, which were highly productive and able to provide fodder for a great concentration of herb-animals that can survive there today.

"The mammoth steppe was not an additional biome between the tundra and taiga, which today merge gradually with one another. Rather the last two mentioned biomes appear to have been in parts a replacement of it."<sup>299</sup>  
(Emphasis added)

The important point to stress is that of more temperate type insects found in the arctic with the mammoth. Not only was there richer vegetation and trees indicative of a warmer climate, temperate insects support the same conclusion.

The scientists have simply invented an environment made up of a mosaic of arctic, boreal, and steppe vegetation growing together, but never known to have existed in that region, in order to allow the mammoths and other animals to survive there. This is specifically admitted by Lister:

"The main habitat of the woolly mammoth during the last Ice Age, between 100,000 and 12,000 years ago, was a vast expanse of grassy vegetation that covered much of Europe, northern Asia and northern North America. THIS VEGETATION HAS NO PRECISE MODERN EQUIVALENT. It is known as a 'mammoth steppe,' or 'tundra steppe,' because it resembles in some way the grassy steppe of southern Russia today, ALTHOUGH THE VEGETATION WAS MORE DIVERSE IN THIS REGION. Contrary to popular belief the mammoth did not live in a habitat dominated by ice and snow. The continental land masses were expanded by lower sea levels, and THE WEATHER IS BELIEVED to have been dominated by high pressure systems so that little rain or snowfall reached the interiors."<sup>300</sup> (Capitalization added)

Now, this ad hoc biome or environment was created to explain what was inexplicable, namely that the present-day arctic tundra was a kind of grassland during a period in the Earth's history when the temperature over most of the Earth was several degrees cooler. I am not debating that the flora did not grow there, as found in some mammoths' stomachs, nor that it did not grow in those far northern latitudes, but what I am suggesting is that during the Ice Age the climate was colder, not warmer in these regions and under colder climatic conditions, one does not get a lush steppic environment with rich vegetation.

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<sup>299</sup>Sutcliffe, *On the Track of Ice Age Mammals*, *loc. cit.*

<sup>300</sup>Lister, Bahn, *Mammoths*, *op. cit.*, p. 74.

If indeed the climate did allow for a rich steppic environment upon which a host of mammals could thrive year round, there would be no reason for reindeer or caribou to have to migrate south, as we discussed above. They would have no ecological need to do so. But contrary to the rich mammoth steppe supposedly existing there for them, they were forced to do just that, just as they do today. Kurten explains:

"The fact remains, nevertheless, that reindeer migrated in winter [in Europe] as far south as the Pyrenees at the height of the last Glaciation, so that conditions can hardly have been so very different, on the whole, from those of Lapland in summer today."<sup>301</sup>

Robert Claiborne, in this respect, discusses the short range of distance the caribou in Europe actually migrated during the Ice Age.

"Consider, for example, the Ice Age reindeer hunters of Europe, whom we can assume followed the migrating herds which were their walking larders. Today's barren-ground caribou (another name for reindeer) of northern Canada, annually cover up to 1,600 miles airline distance, and considerably more than that on the ground. Their Ice Age relatives, living in a Europe with considerably narrower climatic zones, doubtless migrated in a narrower compass. . . ."<sup>302</sup>

While Lapland in northern Norway is about 1,800 miles north of the Pyrenees of Spain, it is roughly at the same latitude of Siberia and Alaska. The reindeer would not have to migrate south into Spain unless in winter it was so bitterly cold to the north and lacked enough vegetation in subglacial Europe that these animals had to go south. That the reindeer was forced to migrate means that all the belts of vegetation were also forced to reestablish themselves far south of their present zones during the Ice Age. This indicates that the more northerly regions of the Earth were colder and not warmer during the Ice Age and that the mammoth steppe did not exist.

However, if Guthrie's mammoth steppe was indeed a reality of the Pleistocene across unglaciated Alaska, Siberia, and Europe, then all these lush grasses which are flowering plants would have shed pollen into the air every year during the long, extended growing period Guthrie postulates, and would have left an indisputable record of their existence in the varves, or silt layers, of lakes in these regions. Whatever foliage was found in the mouths and stomachs of the mammoths, horses, etc., that supposedly inhabited the arctic during the Ice Age, should also leave an indelible record in the varves. Therefore, if the mammoth steppe truly existed during the Ice Age, evidence for it will be clear cut and direct. On the other hand, if the Ice Age varve record fails to

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<sup>301</sup>Björn Kurten, *Prehistoric Animals and their Hunters*, (London; New York, 1968), p. 52.

<sup>302</sup>Robert Claiborne, *Climate, Man, and History*, (New York, 1970), p. 246.

exhibit lush grass pollen, or grasses found in mammoths, then it becomes relatively easy to discern that during this period, they did not inhabit the arctic. They could only dwell in this region when such lush grasses grew there. This is the vital, critical evidence that will determine this question. As we will discover, the mammoth steppe fails this test and on several other basic grounds, as well.

To the contrary, during the Ice Age, one gets an environment more like dry valleys where lush grasses do not grow. And this has been amply demonstrated by palynologists who put this mammoth steppe concept to the rigors of a test. In summer dark sediments are laid down in lakes. In winter when ice covers lakes, light colored sediments settle on the darker ones. These are called varves and can be counted back in time. (One dark and light layer equals one year.)

By examining varves dated to glacial times in lakes when the mammoth supposedly lived in the far north, palynologists could test the mammoth steppe concept. By comparing the amount and types of pollen in each measured cubic centimeter of lake sediment laid down during the last peak glacial period, with what is observed presently, they could determine not only what grew, but how much of it grew. According to the mammoth steppe concept, one would expect many more pollen grains per cubic centimeter than is found today. One cannot expect that if there was much less pollen being generated during the Ice Age than presently, it would be possible for mammoths to survive in arctic climes. Instead of finding more pollen as an indicator of the amount of flora on the mammoth steppe, the palynologists found much, much less than presently exists, as we will see.

First, it must be understood that pollen is an extremely durable plant product. According to Dyson,

"It so happens that pollen is the most nearly indestructible of all plant materials. The shell of the pollen grain is an extraordinarily hard substance and though softened when it comes into contact with the seductive fluids exuded by the ovary in a flower of its own species, it can remain unchanged for an incredibly long time when buried in peat and other sediments. The ducks and the geese of those faraway times have gone and practically all the bones of the moose and the [extinct] giant beaver have weathered away, but in the peat that has filled the myriads of glacier-made lakes and ponds, layer upon layer of pollen grains remain to attest to the life and climate of the times.

"All the pollen grains of a single plant species are identical, and they differ unmistakably from those of any other species. Thus it is a simple matter for a palynologist to determine to which species of plant a pollen grain belongs."<sup>303</sup>

David O. Woodbury further points out:

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<sup>303</sup>Dyson, *The World of Ice*, *op. cit.*, pp. 207-208.

"One of the most useful fossils for tracing temperatures and climates of the past, and universally used in backing up dating estimates, is the microscopic grain shed in great abundance by many trees and plants. Such grains positively identify the flora from which they came; their use in paleontology is called 'pollen stratigraphy.' The method is wonderfully effective for determining the ancient flora in any region and hence . . . ferreting out the facts of the Ice Age. . . .

"Like most good scientific methods, pollen stratigraphy is very simple in concept and very difficult to apply. It consists of obtaining samples of various layers of sediments from the stratum to be dated, then analyzing them for floral pollen grains and determining exactly what species these were. Many living seed plants give off clouds of pollen dust at certain times of year, and this settles on the ground everywhere and completely blankets the region. The pollen must be separated out with the help of a high-powered microscope, and the grains recognized. Botanists have long since learned to tell from the shape and size of the grains what floral species they came from. All pollen varieties have distinctive characteristics just as fingerprints do."<sup>304</sup>

For a clear, understandable explanation of how this process works, see E. C. Pielou's *After the Ice Age*, (Chicago, 1991), pages 51-56. Therefore, if the mammoth steppe theory is correct, one would expect that the pollen stratigraphy research carried out to analyze this concept would support it. If, on the other hand, there was no such grassland mosaic in the arctic, the pollen analysis would refute it. However, the studies that were carried out did much more; they showed that not only was there no rich vegetation growing in the far north during the Ice Age, they showed the arctic region was a polar desert barely capable of supporting anything. In 1980, L. C. Cwynar and J. C. Ritchie examined this pollen-climate-vegetation question and presented their results in *Science*. They analyzed sediments from two lakes in Alaska outside the last (Wisconsin) Ice Age's glaciated area.

"The first reliable, securely dated full—and late glacial stratigraphy of Eastern Beringia forces the rejection of the widely held hypothesis of a steppe-tundra or grassland associated with extinct vertebrates and early humans. The arctic-alpine fossil flora and low pollen influx suggest a sparse tundra similar to modern herb fell-field vegetation. . . . [polar desert].

"Our results do not support a steppe or grassland interpretation for the period between 30,000 and 14,000 years before the present."<sup>305</sup>

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<sup>304</sup>David O. Woodbury, *The Great White Mantle*, (New York, 1962), pp. 159-160.

<sup>305</sup>L. C. Cwynar, J. C. Ritchie, "Arctic steppe-tundra: A Yukon perspective," *Science*, Vol. 208, (1980); p. 1375.

The pollen record from Siberia shows that conditions there were apparently even worse than those in Alaska. According to Owen-Smith, the pollen taken from the stratigraphical layers that were laid down during the height of the Pleistocene show "in Siberia only, *Selaginella* mosses."<sup>306</sup> Where do *Selaginella* or spike mosses grow? Although these mosses grow all over the Earth, according to Pielou, ". . . spike moss, *Selaginella* . . . suggests a dry rocky landscape,"<sup>307</sup> which means the arctic at these latitudes was a polar desert. Now, elephants and all the rest of the megaherbivores, as well as their mid-sized and small neighbors living in Siberia could not subsist on one form of moss or on several forms. As was pointed out above, mammals do not compete for the same diet. If all the various forms of herbivores all competed for the few mosses of Siberia, in a very short time they would all become extinct except for the one form that prevailed over all the others. But as we well understand, nothing of the sort happened.<sup>308</sup>

The point that must be emphasized is that the food remains found in the stomachs and mouths of frozen mammoths and other animals *did not* grow in the arctic during the Ice Age. It had to have grown there at some other time because if it did grow, the varves would have shown that it did indeed exist. The fact that these lush plant pollens are not found in the Ice Age varves means the mammoths did not live in the arctic during the Ice Age. They had to live there at some other time. This is what the pollen record indicates!

Also, an herb fell-field, as mentioned above, is a region where less than half the surface of the ground is covered with vegetation of any kind.<sup>309</sup> That is, the arctic was about sixty to seventy percent or more bare ground with nothing growing on it. It was much more barren at the height of the Ice Age than it is today. Does anyone really believe that in such a frozen desert of bare ground large herbivores roamed and found sustenance? The authors of the paper on pollen go on to suggest that the mammoths could have only lived in Beringia during the warmer "interglacials," when the ice caps melted away or "interstadials," when the ice caps retreated and the temperature of the arctic was not so brutal.

This seminal research was further corroborated by much additional pollen research.<sup>310</sup>

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<sup>306</sup>Owen-Smith, *Megaherbivores*, *op. cit.*, p. 284.

<sup>307</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 130.

<sup>308</sup>For a clear explanation of this ecological principle of non-competition, see Paul Colinvaux, "Peaceful Coexistence," *Why Big Fierce Animals are Rare*, *op. cit.*, pp. 136-149.

<sup>309</sup>Stonehouse, *North Pole South Pole*, *op. cit.*, p. 94.

<sup>310</sup>L. C. Cwynar, J. C. Ritchie, "The late Quaternary vegetation of northern Yukon," *Paleoecology of Beringia*, D. M. Hopkins, *et al.*, eds., (New York, 1982), pp. 113-126; and P. A. Colinvaux, "Vegetation of the Bering Land Bridge," *Quarterly Review of Archaeology*, Vol. I, (1980), pp. 2-15; and P. A. Colinvaux, "Plain thinking on Bering Land Bridge vegetation and mammoth populations," *Quarterly Review of Archaeology*, Vol. 7, (1986), pp. 8-9; and P. A. Colinvaux, F. H. West, "The Beringian Ecosystem," *Quarterly Review of Archaeology*, Vol. 5, (1984), pp. 10-16.

The palynologists say Alaska and Siberia were frozen deserts. What, then, of Europe? According to Michael Jochim, it, too, was a polar desert.

"The entire Upper Paleolithic coincides with the last half of the Wurm [Wisconsin] glacial period. Around 25,000 B.P. the cold conditions of the glacial maximum began culminating in peak cold conditions about 18,000 B.P. Different areas of Europe were affected differently by this climatic deterioration. Northern and central Europe were most seriously affected, northern Europe because of its high latitude and proximity to the Scandinavian ice sheet, and central Europe because it was situated between the Scandinavian and Alpine glaciers. Both areas were subjected to low average temperatures, long winters, permafrost, and high winds, and consequently were increasingly harsh environments marked by decreasing vegetational and faunal abundance and diversity. Duplessy, *et al.*, . . . characterize the Low Countries as a polar desert between 25,000 and 14,000 B.P. Monet-White . . . describes the entire plains of northern Europe as an arctic desert after 22,000 B.P. On the basis of detailed study of palynological records for southern Germany, Frenzel . . . suggests that in this area, vegetational productivity and large herbivore biomass decreased between 90% and 95% from the early glacial to the glacial maximum."<sup>311</sup>

What does the term "desert tundra" mean? According to Howard J. Critchfield,

"The southern limit of the tundra coincides fairly well with the 10°C [50°F] isotherm for the warmest months [in the arctic]. In the areas with warmer summers the chief vegetation forms are mosses, lichens, sedges, stunted willows, and occasional [low growing] birches and aspens. Farther poleward there are few if any bush forms, and under the more severe climatic and edaphic [soil] conditions, expanses of bare rock, boulder fields, or gravels have practically no vegetation. These latter areas are known as desert tundra. . . "<sup>312</sup>

The reason for this according to Critchfield:

"Most plants cease growth when the soil temperature drops below 5°C [25°F]. If the soil temperature is low the rate of intake of moisture through the roots is decreased and the plant may not be able to replace water lost [given off through leaves or needles] by transpiration."<sup>313</sup>

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<sup>311</sup>Michael Jochim, "Late Pleistocene Refugia in Europe," *The Pleistocene Old World*, O. Soffer ed., (New York, 1987), pp. 320-321.

<sup>312</sup>Howard J. Critchfield, *General Climatology*, 3 ed., (Englewood Cliffs, N.J., 1974), p. 231.

<sup>313</sup>*Ibid.*, p. 223.

Richard Perry, in describing the conditions on the present tundra, points out that although

" . . . the majority of [tundra] species have abundant seeds, these do not germinate in the cold soil prevailing from midsummer to autumn, and must wait to do so until the snow melts in the spring. Even then low temperatures result in most dying without germinating. Only the few, such as the ice-buttercup . . . can survive several years' burial beneath semi-permanent snow drifts. In the High Arctic, seedlings are very rare, and some grasses, saxifrages and buttercups never produce mature seeds."<sup>314</sup>

Based on all the evidence, the arctic, during the Ice Age, was a tundra desert with primarily bare ground and little vegetation. Over and over again, the palynological evidence shows that during the Ice Age, the far north was a barren desert. Over and over again, the word "desert" is repeated by the investigators who examined the record. This record categorically contradicts the mammoth steppe concept and proves the mammoths did not live in the arctic during the Ice Age.

Grayson makes it quite clear that the pollen evidence is totally negative to the mammoth steppe theory:

"The results of exacting work in eastern Beringia have produced reasonable accord among pollen workers, virtually none of whom see anything resembling Guthrie's mammoth steppe."<sup>315</sup>

Kurten who favors Guthrie's mammoth steppe nevertheless was forced to the admission that

"Ice-age Beringia, a great lowland area . . . was largely a herbaceous tundra . . . Paul A Colinvaux sums up the vegetation history which is spelled out in pollen diagrams from ancient lake-beds and marshes: the climate of the Wisconsin was even colder than now. In spite of the continentality of the Beringian land mass, summers were shorter and colder than those of the present day. And the Arctic Ocean was covered by ice, . . .

"In wintertime, with temperatures down to -70F, the ground was frozen."<sup>316</sup>

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<sup>314</sup>Perry, *The Polar World*, *op. cit.*, p. 226.

<sup>315</sup>Grayson, *The Desert's Past*, *op. cit.*, p. 50.

<sup>316</sup>Kurten, *Before the Indians*, *op. cit.*, p. 53.

How much less pollen was discovered compared with pollen stratigraphies of the present time? Pielou, in fact, shows that the

"... argument against the arctic steppe theory is that pollen samples have failed to provide any evidence for it. On the contrary, measurements made in the northern Yukon show pollen influx rates of only 100 grains per square centimeter per year. This is the amount of pollen that very sparse tundra vegetation, with much bare ground, would be expected to give, a dense sward of grass would give ten times as much."<sup>317</sup>

In essence, there was only a tenth as much pollen as that of a grassland. Today, the southern arctic tundra barrens are not more than fifty percent bare ground and that is the death knell to any suggestion that mammoths and other large mammals lived there during the Ice Age. With about a tenth of the amount of grass necessary on the arctic tundra, it is not realistic to suggest that even caribou could survive there year round.

Pielou further shows that the findings of the palynologists is fully corroborated by other pollen studies.

"Evidence from the land, too, suggests that the ice-free part of Beringia's south coast had a truly arctic climate [during the Ice Age]. What is now Saint Paul's Island, one of the Pribolof group, was [in the Pleistocene] a small hill in the low almost level, Beringian plains. The pollen and spores in a sediment core taken from a lake on the island has revealed the history of the region's vegetation. At glacial maximum, there were no trees or woody shrubs, only a tundra of herbaceous plants typical of cold, dry climates; there was probably much bare ground, sparsely dotted with tough grass and wormwoods and plenty of the spike moss... which suggests a dry, rocky landscape. The vegetation was very like that farther north in Beringia, which is known from sediment cores collected in the Seward Peninsula and at point Barrow."<sup>318</sup>

Point Barrow is some 300 miles north of the Arctic Circle while the Seward Peninsula is just below it. This evidence shows that these areas north and south of the Arctic Circle were not mammoth steppes during the Ice Age, but were frozen tundra deserts which contained little vegetation suitable for forage and large areas of nothing but bare ground. This evidence also contradicts the mosaic landscape presented as a rich steppe by its advocates.

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<sup>317</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 153.

<sup>318</sup>*Ibid.*, p. 130.

But even farther to the south in the State of Washington, according to C. J. Heusser, this zonal distribution is exactly what was found to have occurred. He examined a sea cliff which contained pollen in its sediments.<sup>319</sup> This area was far south of unglaciated Alaska and the pollen record covered a period of over 60,000 years. What the record proved was that the nature of the type of vegetation changed between tundra and forest repeatedly as a result of climatic fluctuations, but it never produced a mammoth steppe.

Again the pollen record contradicts the belief that a mammoth steppe existed in the far north during the Ice Age. All in all, Grayson sums up the evidence.

"The ecologist Paul Colinvaux has characterized Late Wisconsin eastern Beringia as a bleak place: 'Frozen ground; clouds of loess, catabatic [strong cold] winds from glaciers; short summers, in places drier or warmer than now.' These words present a picture of interior Alaska and the adjacent Yukon that contrasts in almost every significant way with Guthrie's mammal-based reconstruction. Whether things were really this bleak we do not know, but the pollen work establishes that, although the Beringian tundras were a complex matter, *they were, in fact tundra*, and not the productive grassy steppe called for by Guthrie."<sup>320</sup> (Emphasis added)

What must be stressed is that the islands of the Pribilof are well south of mainland Alaska and there it was found to be nothing but cold tundra during the Ice Age. What, then, had to be the climatic and vegetative conditions a thousand miles to the north? Of course, the conditions were even more brutal and inhospitable to large herbivores. If today one does not see a single moose ranging over thousands of miles in Alaska, then during the Ice Age, one would not find a single moose ranging over ten thousand miles of Alaska.

The view that sufficient vegetation grew in the high arctic during the Ice Age not only fails to meet the fundamental pollen evidence, but is in fundamental conflict with basic principles of ecology. The mammoth steppe defies the rule of actualism.

Guthrie's argument for the mammoth steppe is, in the final analysis, a circular one. Since he knew that tundra vegetation was either poisonous, lacking in nutrition, or inappropriate for a varied group of megaherbivores to subsist, he took it as a given that, during the Ice Age, some totally different forms of vegetation had to grow there to meet the nutritional requirements of all these animals. What he did then was to interpret these pollen studies to make them appear to create a mammoth steppe and also did the same for the remains found in the stomachs of various mammals. But he never explained away the evidence, as will be shown below, of why the various biomes shifted either northward or

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<sup>319</sup>C. J. Heusser, "Palynology and phytographical significance of a Late-Pleistocene refugium near Kalaloch, Washington," *Quaternary Research*, Vol. 2, (1972), pp. 189-201.

<sup>320</sup>Grayson, *The Desert's Past*, *loc. cit.*

southward as a natural response to climate. Since that fundamental ecological, actualistic phenomenon overruled his thesis, he simply and baldly suggested it had no relevance by ignoring it. But its relevance is overwhelming and that is also the downfall of this theory.

Flint earlier looked at the evidence and also realized, as Sanderson, "that the rich Alaskan fauna are probably interglacial."<sup>321</sup> He understood, as even the most naive ecologist, that vegetative zones are real facts of nature. One cannot invent a biotic zone that has never been observed. As Guthrie frankly admits, "ecologists have difficulty imagining the Mammoth Steppe because it was a biotic zone that no longer exists."<sup>322</sup>

What ecologists fully understand is that the mammoth steppe contradicts basic facts and understandings of biology, climatology and geology on a very simple level.

Colinvaux discusses the historical background to this. The research goes back to Alphonse de Candolle, a taxonomist and herb botanist who organized the plants of the world in his book, *Prodomus*. What he found was that trees, as particular groups or other vegetation, were always found together to form a group. He believed these groupings were related to climate. Certain types of trees or other vegetation were always associated with a particular climate. The plants became markers of the climate.<sup>323</sup> Colinvaux then adds,

"The answer the meteorologists chose was to accept Candolle's conclusion that it was weather that set the boundaries to the nations [groupings] of plants. They mapped the plants and called them 'weather.'

"Most notable of the climatologists of this period was Vladimir Koppen of Vienna, who not only acknowledged Candolle's conclusions and used his maps but also agreed that the five main kinds of formation recognized by botanists must represent five principal classes of weather. Tropical rain forest, hot desert, temperate deciduous forest, the boreal [pine] forest . . . and the tundra. . . . All maps of climate, even those used today, reflect those original decisions of Vladimir Koppen and his peers.

"Any contemporary atlas will contain, next to the map of the world's vegetation, a map of the world's climate. . . . The two will match because they are the same map."<sup>324</sup>

To be exact, there are specific belts—climate habitats—that always exist in the northern and southern hemispheres all across the Earth. For our purposes:

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<sup>321</sup>R. F. Flint, *Glacial and Quaternary Geology*, *op. cit.*, p. 771.

<sup>322</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, P. 269.

<sup>323</sup>Paul Colinvaux, *Why Big Fierce Animals Are Rare*, *op. cit.*, pp. 50-51.

<sup>324</sup>*Ibid.*, p. 51.

"Most people are familiar with maps of the major vegetation types of North America, showing a strip of tundra in the far north, a strip of coniferous forest immediately south [a strip of deciduous forest farther to the south and grasslands even farther south]. . . . It is easy to envisage similar maps showing the vegetation zones as they must have been at different times in the past, when the great ice sheets covered much of the north. And it is not difficult to visualize a motion picture version, with the zones creeping southward as the ice sheets grew and then creeping northward again when the climate warmed and the ice sheets slowly melted. . . .

"When an ice sheet expanded one of two things happened depending on the cause of the expansion. If the ice spread because of climatic cooling, then the cooling would also have affected the vegetation ahead of the ice front. The less hardy plants gradually died off, and permafrost (perennially frozen ground . . . ) formed, seriously inhibiting the growth of trees. . . .

"Zone margins also migrate, . . . when an ice sheet shrinks. What actually happens is that seeds are blown into the area laid bare by the melting ice, where they germinate and grow."<sup>325</sup>

What all ecologists fully understand is that when the climate becomes colder the floral belts migrate south, and north when the weather becomes warmer. Of course, the trees do not migrate, what migrates is an abstract line on the map of the vegetative zone.

This migration pattern is so fundamental that to ignore it, I suggest, is to invent epicycles. For example, Clyde Orr, Jr. described the changes in the distribution of certain vegetation during the fifty year period of warming between the 1890's and the 1940's:

"Larch, spruce, yellow birch, sugar maple, black ash and white pine trees that demand cold weather—have been growing farther north."<sup>326</sup>

Trees also migrated north during the climate-optimum or, as I call it, the hipsithermal- a period of much greater warmth in the arctic regions between 8,500 to 3,000 years ago. Charlesworth describes how the northern belt of vegetation responded to this warmer climate.

"A number of marsh and freshwater plants . . . had a wider distribution toward the north, as had the water chestnut. . . .

"Trees grew [even farther north] in Norway's outermost islands and as far as Ingo Island of North Cape. . . .

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<sup>325</sup>Pielou, *After the Ice Age*, *op. cit.*, pp. 81-83.

<sup>326</sup>Clyde Orr, Jr., *Between Earth and Sky*, (New York, 1961), p. 162.

"The sub-Mediterranean oak, . . . whose northern limit today runs to the Alsace, the Jura Mountains, east Alps, Bohemia and Hungary, . . . extended in the Optimum time [the hipsithermal] as far as the North [Baltic seas]. . . ." <sup>327</sup>

He also describes a number of temperate animals that also migrated with the floral belts northward. There is simply no way around this situation of climatic shifts and it has always been known to occur since the Ice Ages began.

"When the glaciers receded and the steppes warmed up, forests spread and with the forests came a different group of animals.

"This seesaw between temperate forest . . . and a cold . . . tundra had started with a fairly stable condition in the late days of the Tertiary period." <sup>328</sup>

Even Kurten claims that this process must ensue.

"As the climate becomes warmer, plants and animals migrate into areas abandoned by the shrinking ice sheet. The hardiest . . . came first. The birch is usually the first forest tree to appear on a large scale; next a coniferous forest spreads into the area. If the climate goes on warming up, the area will be invaded by various kinds of broad-leaved trees, the so-called mixed oak forest. . . .

"But the pendulum . . . swing[s] and once more ice begins to accumulate. In the fossil record we can see how the vegetation belts, shifting southward, pass across a particular area. The mixed oak forest is succeeded by coniferous forest, and that in turn by birch, then comes tundra vegetation and finally—if we are within the area covered by land ice—the glacial drift deposits.

"This is the pulse of climate in northern Eurasia and North America and also in the smaller glaciated areas in most of the other continents." <sup>329</sup>

Guthrie, in spite of these fundamental, actualistic facts, chides his fellow paleobotanists who find "this [mammoth steppe] concept . . . to be particularly heretical to many paleobotanists who are reluctant to abandon the 'geoflora' [plant zone] concept

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<sup>327</sup>J. B. Charlesworth, *The Quaternary Era*, Vol. II, (London, 1957), pp. 1484-1487.

<sup>328</sup>Willy Ley, *Dragon in Amber*, *op. cit.*, p. 112.

<sup>329</sup>Björn Kurten, *The Age of Mammals*, *op. cit.*, p. 189.

and rather prefer to think in terms of cliseral shifts of biotic provinces altitudinally and geographically through time."<sup>330</sup>

It is not a case of preference, but one of evidence. The scientists have observed that the pollen record and climate record show that biotic plant zones do exist and have shifted either northward or southward as the climate becomes warmer or cooler. To dismiss this most basic ecological, meteorological correlation is simply unscientific, especially in view of the pollen evidence. If the mammoth steppe, with all the various flora existed, then these plants would have shed clear pollen evidence and the cores would undeniably exhibit these plants and their numbers unambiguously. But this is in no way the case.

Dillehay, a proponent of the mammoth steppe concept as late as 2,000, still maintains, "Despite its treeless and barren appearance, Beringia's rich tundra supported huge herds of grazing animals, as well as the hunters who preyed on them."<sup>331</sup> He cites D. Hopkins, *American Beginnings*, (Chicago 1996). In that book, other proponents of the mammoth steppe present much the same kinds of evidence that will be discussed below. However, Paul A. Colinvaux, a contributor to that volume, points out that the region's land surface was "a dry, windswept plain of patterned ground" with remnants of "ice wedges." This, we will point out, is a clear indication of a polar desert. He cites L. Cwynar that, even if the region had some flora, it was "equivalent to that of the stark barren-land tundras of the modern Canadian Arctic archipelago," which will not support such large herds of grazing animals.<sup>332</sup> He cites Anderson and Brubaker, whose work appears in the same volume, that the pollen spectra from the southern Brooks mountain range most closely "matches. . . the bleakest most unproductive tundras in mainland Alaska."<sup>333</sup> He claims that "the evidence of pollen analysis, now based on perhaps several dozen lake sections from Alaska, [indicates] . . . no pollen history that offers a different interpretation,"<sup>334</sup> and then adds

"Despite this suggestion of a tundra habitat (rather than a [mammoth steppe] grassland) for the mammal megafauna, the difficulty remains of accounting for the nutrient requirements of large animals if Beringia was an unproductive place. Thus, the vegetation and environment suggested by mammal

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<sup>330</sup>R. Dale Guthrie, "Mammals of the Mammoth Steppes Paleoenvironmental Indicators," *Paleoecology of Beringia*, D. M. Hopkins, et al., eds., (New York, 1982), p. 309.

<sup>331</sup>Dillehay, *The Settlement of the Americas*, op. cit., p. 61.

<sup>332</sup>*Ibid.*, p. 16.

<sup>333</sup>*Ibid.*

<sup>334</sup>*Ibid.*, pp. 16-17.

remains [in the region] are quite different from the vegetation and environment reconstructed by all the botanists who have looked at the pollen record."<sup>335</sup>

As with the hunting and climate theories, the pollen evidence indicates directly that the mammal megafauna of Beringia could not have inhabited that region during the Ice Age, so other forms of evidence are being suggested, such as the evidence given in the same volume by Ukrantseva, Agenbroad, and Mead that the stomach contents of the frozen carcasses, as well as plant fossils in associated sediments, suggest a rich environment. But it never occurs to the researchers that this rich environment existed only after the Ice Age ended; for surely, if this mammoth steppe existed, the pollen spectra would be there to corroborate it. I believe this debate will go on for a long time, just as with the hunting and climate theories; both sides becoming more and more entrenched, as with these other uniformitarian hypotheses. The evidence simply doesn't fit, but will be forced to fit because it is necessary to their uniformitarian doctrine.

However, I believe that because this is the only uniformitarian theory that will provide forage for the megaherbivores during the Ice Age, it will have to be accepted evidence or not. I believe it will become the dogma of future scientific thought as have so many other concepts discussed earlier in this book.

Contrary to everything said about the mammoth steppe, Pielou specifically states:

"Throughout most of the Quaternary, the polar regions have been extremely cold, FAR COLDER THAN THEY WERE IN earlier NONGLACIAL PERIODS. There is, therefore, a strong equator-to-pole temperature gradient and it is this that causes the latitudinal zonation of vegetation familiar to all ecologists."<sup>336</sup> (Capitalization added)

Pielou makes it quite clear that it was not warmer in the polar regions, but colder during glacial periods, while Lister also makes it clear that the mammoth steppe is contradicted by pollen studies. "Others, however, believe that pollen found in deposits from these interglacial periods indicate that separate zones of forest and tundra did exist as they do today."<sup>337</sup> What he means, of course, is that the palynologists have found what all those above have told us, namely, that the various zonal habitats and/or biomes moved either north or south as the temperature warmed or cooled. If the mammoth steppe was in anyway a reality, the palynologists, as they did their pollen stratigraphies for these distant periods, would have found evidence to support the concept, but instead they say

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<sup>335</sup>*Ibid.*, p. 17.

<sup>336</sup>E. C. Pielou, *Biogeography*, (New York, 1979), p. 123.

<sup>337</sup>Lister, Bahn, *Mammoth*, *op. cit.*, p. 134.

that the same zones of grassland, forest, and tundra have always existed and that a mammoth steppe has never existed across the arctic basin regions at all.

Pielou goes on to show that this geographical climatic distribution is also found on mountain ranges. The higher up a mountain range the climate is cooler, and the lower the altitude of the range the climate is warmer.

" . . . the altitudinal vegetation belts on the slopes of the Andes moved up and down as the climate warmed and cooled. The humid grasslands ('paramo') lying between timberline and the permanent snowline in the northern Andes behaved in this manner. In warm periods, the paramo is restricted to narrow belts high in the mountains, separated from one another by intervening montane forest. In cool periods the paramo is forced down to lower altitudes, causing its separate parts to coalesce."<sup>338</sup>

There is no reason to assume that the climate zones over the past million years did not simply move north and south on the Earth or up and down mountain ranges as the climate warmed and cooled. To deny this is to deny the concept of "actualism" which means one may not invent phenomenon that do not exist. Yet that is what the mammoth steppe concept requires. If such an environment actually existed anywhere on the Earth, the advocates of this theory would point to it. That they cannot is fatal to the hypothesis.

This does not mean that all the plants together migrated. With an almost overnight change in climate there would be a varied response by each plant species that survived the catastrophe to cope with the new climate environment. Some would die out immediately. Others would shed pollen into distant niches that permitted them to survive; while still others would simply migrate northward or southward as rapidly as possible. A very gradual climate change would allow the plants to migrate generally together into the new environments open to them. A sudden, permanent climate catastrophe would create a chaotic migration. And this is just what has been found based on recent data. Schneider informs us:

"The ecologist Margaret Davis, at the University of Minnesota, first suggested that individual species responded differently as the climate warmed [at the end of the Ice Age]. Then . . . COHMAP (Cooperative Holocene Mapping Project) examined the fossil remains of pollen grains from many types of plants going back to the height of the last ice age. They found that species like spruce or oak did indeed chase the ice cap northward as it melted, but not the way . . . most ecologists envisioned, as a march of intact communities. Instead, the COHMAP scientists discovered that during the transition from ice age to interglacial times, species moved at different rates and even in different directions from each other. One might say that the trees moved, but the old forests disappeared, as the combination of trees, herbs, and grasses went through

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<sup>338</sup>Pielou, *Biogeography*, *op. cit.*, pp. 127-128.

many unique or unfamiliar combinations during the transition—what is called a 'no-analog' habitat, since nothing like it exists today."<sup>339</sup>

Although some have suggested these new environments caused the Pleistocene extinction, they overlook the fact that this climate disruption supposedly happened at least four prior times without such broad extinction consequences. Yet, here we have evidence, I suggest, which indicates the climate change was sudden and catastrophic, marked by pollen stratigraphies of unusual plant associations which lasted a brief instant in geological history. Yet over about 100,000 years, the "no-analog" mammoth steppe left no such data. Gradual climate change would have led to gradual migration of whole plant communities roughly together. Sudden catastrophic climate change leads to just what has been found.

The catastrophe which ended the Ice Age opened great regions to warmer temperate conditions for new plants to inhabit, and created a no-analog migration condition. But the catastrophe which ended the hypsithermal closed great regions for plant habitats and created all the conditions described above and described in the following chapters.

Nearly all investigators say that the mammoths lived on a mammoth steppe which was mainly a grassland and, therefore, the animals needing this grassland environment could not find it when they became extinct. But Haynes explains:

"Many late Pleistocene grasslands remained open environments throughout the Late Glacial period, and yet their carrying capacity in regard to herbivores decreased greatly [instead of greatly increasing]. Hence, there is reason to question the argument advanced by some scholars to refute Pleistocene-Holocene [climate] environmental change as a major cause for megafaunal extinction, which argument often takes the following form: Grasslands did not shrink in extent at the end of the Pleistocene, and may have even increased in size, the main implication being that Holocene [post Ice Age] grasslands should have been able to support megafauna as well as or better than Pleistocene grasslands."<sup>340</sup>

This introduces another fundamental fact that contradicts the concept of the mammoth steppe just as definitively as the pollen evidence. This has to do with arctic type plants in Asia where there was no continental glacier. If there truly existed a warm mammoth steppe in Siberia and Alaska, then cold arctic flora would have to migrate to the north to inhabit the biome and the niche in it that allows this vegetation to thrive. It

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<sup>339</sup>Schneider, *Laboratory Earth*, (New York 1997), p. 94.

<sup>340</sup>G. Haynes, *Mammoths, Mastodons & Elephants*, *op. cit.*, pp. 269-270.

would never migrate south during the Ice Age. But this is exactly what it did, according to P. J. Darlington.

"During the glacial ages, arctic animals moved southward before the ice and then northward again as the ice withdrew, and they sometimes left behind them populations which moved upward on mountains instead of northward, became isolated and survived at high [cold] altitudes as 'stranded' arctic relics. . . . The occurrence of arctic PLANTS . . . isolated on high mountains in Europe (they occur also in Asia and North America) was known long ago. . . ." <sup>341</sup>

The point to emphasize is that if there really was a warm mammoth steppe around the arctic basin, then cold-loving arctic flora would migrate as far north as possible into the bed of the Arctic Ocean which had been lowered to form the great ice caps. They would never have migrated south unless the temperatures and conditions in the arctic were too cold for them to adapt. And in fact, the arctic flora did migrate south and then became stranded when the climate warmed and migrated up mountain ranges. The evidence against the mammoth steppe is just too basic. It again gives direct support for the zonal migration of plants, contrary to Guthrie's mammoth steppe.

Related to this ecological concept of zones of plants is the concept of zones of animals. This is also a well understood aspect of ecology. As Colinvaux explains,

"The northern lands beyond the arctic treeline are well vegetated in the sense that the ground is almost completely covered with plants, but relatively few kinds of plants make up this vegetation mat of the tundra. There are more kinds of plants in the boreal forest to the south, more still in the temperate deciduous forest lands and the prairies, and very many more still in the tropical regions. The same sort of thing is true for animals; a few kinds in the extreme north and progressively more with every degree of latitude south down to the equator. There is, indeed, a general cline of diversity running from the poles to the equator, with more snakes, more insects, more mammals, more ferns, more grasses, more everything in the tropical lands." <sup>342</sup>

Therefore, during the Ice Age when the arctic region was colder than today, the number of plants and animals that would have inhabited it would have been even sparser than today. This concept of biological zones forbids greater numbers of plants and animals living in the far north. It is only by ignoring this fundamental ecological relationship that certain scientists will advocate the mammoth steppe theory. But, as has

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<sup>341</sup>P. J. Darlington, *Zoogeography*, (New York, 1963), p. 585.

<sup>342</sup>Paul Colinvaux, *Why Big Fierce Animals Are Rare*, *op. cit.*, pp. 194-195.

been and will be shown below, the evidence thoroughly contradicts the concept and thus has required a host of ad hoc, special pleading type explanations by its advocates.

If there truly was a mammoth steppe, one would naturally expect the climate of the Earth to reflect just this condition. Not only would the arctic region exhibit somewhat greater warmth during the Ice Age but so, too, would the rest of the Earth. This, I must say, strikes me as absurd to claim that during the Ice Age the arctic basin slightly warmed, but most of the rest of the Earth, for some unique reason, instead cooled.

Well aware of this conundrum, William Farrand in 1961 commented on this paradox to the theory that during a colder period, the vegetation of the arctic was of a warmer and more temperate condition than today.

"In general, the floral assemblage is 'richer . . . somewhat warmer and probably also moister' than the present flora of the tundra in which frozen mammoth carcasses are now found"<sup>343</sup>

But the point Farrand goes on to emphasize is that the Beresovka mammoth, found on the Arctic Circle in Siberia, lived at a "slightly warmer [time] than the present . . . an apparent paradox remains—that the climate in northern Siberia [and Alaska] was warmer than at present at some period in late glacial time when climates elsewhere on the earth were cooler."<sup>344</sup>

The evidence for cooler conditions on the Earth during the Ice Age was undoubtedly proven by a host of researchers of which the following is a short listing of the evidence.

Based on evidence of proxies or organisms and relic physical evidence, which have still to be fully corroborated but which are, nevertheless indicators of climate, the tropics, during the Pleistocene, became cooler and drier regions. According to David Raup, there "is considerable evidence that the Amazon Basin and West Africa became cooler and drier at least four times during the past fifty thousand years, and the rain forest must have contracted." <sup>345</sup>

In essence, during the Pleistocene it is suggested that the torrid zone became so cool and dry that the rain forest could only survive in refuges in a few areas, and shrunk in size to about 16 percent of its present regional dimensions. We are, therefore, expected to believe that while the temperate zones became cooler and the torrid zone shrank and also became cooler during the last Ice Age, some amazing climatological

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<sup>343</sup>William R. Farrand, "Frozen Mammoths and Modern Geology," *Science*, (March 17, 1961), p. 730.

<sup>344</sup>*Ibid.*, p. 733.

<sup>345</sup>Raup, *Extinction, op. cit.*, p. 135.

condition allowed the most northerly region, the frigid, arctic zone, to become warmer than at present. The logic underlying such a proposal is staggering.

This is especially so because it is well-known that the temperature gradient adjacent to land masses touching the Arctic Ocean makes them much cooler. And whatever the level of the Arctic Ocean was during the Pleistocene, it was undoubtedly much cooler than it is today. Pielou shows how this phenomenon operates stating, "all zones are displaced southward in the neighborhood of cold seas."<sup>346</sup> On page 125 of her book, *Biogeography*, she shows that the colder temperature gradient around and especially south of Hudson Bay—a cold body of water—extends much farther south than to the west of it in north central Canada. She adds that to the south of Hudson Bay, "tundra vegetation extends into the lowest latitude at which it is found at the present day."<sup>347</sup>

According to Stephen H. Schneider: "At the peak of the Ice Age, frigid water-surface temperatures, now confined to the iceberg-infested waters at the high north latitudes near Greenland, extended as far south as Spain."<sup>348</sup> He goes on to show that the surface temperature of today's polar water at 2°C or 34.6°F during the Ice Age was confined to the latitude of Spain.<sup>349</sup> And further explains "that the warm waters carried by the Gulf Stream ocean current that today keep the England, Ireland and Northern Europe region relatively mild were displaced south of Spain in the Ice Age."<sup>350</sup>

Schneider goes on to point out that "England and Hudson Bay have vastly different climates despite their similarity in latitude."<sup>351</sup> England is adjacent to the Atlantic Ocean and is warmed by the Gulf Stream, while Hudson Bay is surrounded by land and adjacent to the cold Arctic Ocean. Clearly the contrast in climate is explained by these factors.

This cooling phenomenon must have operated even more strongly during the Pleistocene even with a lower ocean level.

Not only do cold oceans cool the land adjacent to them, but so, too, do the great ice caps. As Pielou explains,

"When the ice sheets were big, they must have been the source of strong *Katabatic* winds. A *Katabatic* wind is the flow of cold and therefore dense air

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<sup>346</sup>Pielou, *Biogeography*, *op. cit.*, p. 124.

<sup>347</sup>*Ibid.*

<sup>348</sup>Stephen H. Schneider, *The Genesis Strategy*, (New York, 1976), p. 66.

<sup>349</sup>*Ibid.*, p. 350

<sup>350</sup>*Ibid.*

<sup>351</sup>*Ibid.*, p. 171.

down a sloping of land or ice. Strong Katabatic winds flow off the world's two existing ice sheets, in Greenland and Antarctica; at one Antarctic station a mean hourly wind speed of 156 kilometers [95 miles] per hour has been reported."<sup>352</sup>

Although these winds warm as they descend, as they expand they are as cold "as winter winds."<sup>353</sup> Thus, year round the winds descending from the great ice caps were cold and cooled the lands adjacent to them. But during the Ice Age there were a great many mountain glaciers in the high northern latitudes and these too would have added Katabatic winds to cool the adjacent environment. Then there are the great numbers of icebergs that would be released. "Each spring during the period of maximum glaciation (about 18,000 to 14,000 years ago) a great fleet of icebergs were launched into coastal waters. This kept the waters cool and created very cold winds that cooled the land as well."<sup>354</sup>

In the most basic terms all the ecological evidence again and again contradicts the concept that megafauna lived around the arctic basin during the Ice Age because it was colder at that time and not warmer than the present.

And this can be decisively proven by a basic analysis of the regions of the north covered by permanently frozen ground called permafrost. Permafrost requires, as will be discussed below, a mean annual temperature below the freezing point of water. Therefore, when the climate in the northern polar regions becomes colder, the permafrost expands southward and, conversely, when the temperature warms the permafrost melts and shrinks or migrates northward. According to Dyson, during the warming period that occurred between around 1890 and 1940, "the permafrost limit in Siberia migrated northward thirty miles during the first half of the century."<sup>355</sup>

Thus, like the migration of climate zones, the extent of the permafrost can clearly determine whether or not the circumpolar lands during the Ice Age were warmer, as the mammoth steppe advocates claim, or cooler, as the palynologists suggest. And this is crucial in the debate. One cannot rationally expect that a colder tundra than today would generate enough green vegetation to sustain the megafauna. On this point of the extent of the permafrost during the Pleistocene, Richard Foster Flint points out:

"Under the climatic regimen of today, permafrost in the Northern Hemisphere extends southward, even in discontinuous patches to only 52N in North America and to 66N in Europe, positions at which mean air temperatures are a little above 0C. *In the latest glacial age permafrost is believed to have*

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<sup>352</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 26.

<sup>353</sup>*Ibid.*

<sup>354</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 115.

<sup>355</sup>James L. Dyson, *The World of Ice*, *op. cit.*, p. 176.

*extended much farther south.* This statement is based principally on the following reasoning. Frost cracks, and the ice wedges created from them, are active today, not in the peripheral part of the permafrost region but only in the more central part where the mean air temperature is -6°C or lower. Ice wedge casts, a relic form of ice wedges, are present in drift of the latest glaciation in central Europe, penetrating to depths as great as eight to ten metres [26 to 32 feet]. Because mean temperatures at least as low as -6°C seem to be required for the development of such structures, glacial age mean temperatures in parts of central Europe are thought to have been lower than they are now by 15°C to 18°C [27 to 34.4°F], and the southern limit of permafrost is thought, by analogy, to have stood farther south than central Europe. In central North America, likewise, relic ice-wedge casts of glacial age are known. They imply former mean temperatures 10°C to 15°C [18 to 27°F] below those of today."<sup>356</sup> (Emphasis added)

In essence, ice wedges can enter cracks in earth and when the temperature drops below -6°C, the ice expands and cracks the ground in a characteristic manner which can be recognized. This is especially telling with regard to deep soils buried 26 to 32 feet beneath the surface. In order to crack these areas with ice wedges, the temperature at that depth has to be at least -6°C. But today, the regions in Europe and North America where permafrost exists is in the extreme far north of these lands. This means the permafrost region extended much farther south in North America and Eurasia than today and that the circumpolar lands had to also be even colder than they are presently. Ergo, no rich grasses grew there; the tundra was much more barren and the megafauna did not and could not have lived there during the Ice Age.

In addition, there is the evidence from patterned ground.

"Patterned ground is another sign of extreme cold; repeated freezing and thawing of the soil near the surface cause it to become sorted into a fairly regular pattern of raised polygons outlined by a network of rock-filled ditches. So-called fossil patterned ground has been found in several places south of the southern most ice limit, for example, in Idaho and Pennsylvania."<sup>357</sup>

Most of the patterned ground has been destroyed by forest growth, but the patterned ground found again confirms that the land adjacent to the ice sheets during the Ice Age was much colder and not warmer.

As we earlier discussed solifluction or gelifluction flows, if the cold regions of the Earth had expanded southward, we would expect these to have left evidence of the expansion of arctic temperatures southward as well. In this respect, Sutcliff states, "Old

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<sup>356</sup>Richard Foster Flint, "Pleistocene Epoch," *Encyclopedia Britannica, Macropedia*, Vol. 14. (Chicago, 1982), p. 567.

<sup>357</sup>Pielou, *After the Ice Age, op. cit.*, p. 85.

gelifluction deposits of Pleistocene Age are widely distributed outside the present-day periglacial areas and give valuable evidence of former, colder conditions."<sup>358</sup>

The periglacial regions of the Ice Age are the areas of land just outside the continental ice cap. These periglacial areas extended outwards for a good distance. Sutcliff informs us that solifluction deposits are found "widely distributed outside present-day periglacial areas." This requires that the ground in all these regions was underlain by permafrost to allow gelifluction to occur.

As we pointed out above, mollusks inhabit regions where they are suited to the temperature of the waters, although some can tolerate a wide temperature range. Based on recognized mollusks, E. M. Van Zinderson Bakker cites De Heinzelin that "during the later upper part of the upper Pleistocene, [*i.e.*, presumably, in glacial times], the water of the [Nile] river in Nubia was definitely colder than at present."<sup>359</sup> As for the rest of the Mediterranean, Jonathan D. Sauer writes, "Butzer . . . noted that full glacial climates in the Mediterranean region were so harsh that refuges for temperate forest species were not islands of familiar vegetation but strange associations, probably stunted and sparse in growth."<sup>360</sup>

According to V. Markgraf, temperature measurements generally paralleling each other for mountain ranges including the Alps, the Carpathians, Japan, the Rocky Mountains, New Guinea, Australia, New Zealand, East Africa and the Andes of Columbia show that the summer temperatures in these regions was at least 4°C [7.2°F] cooler during the glacial maximum.<sup>361</sup>

Haynes further shows:

"[R. G.] Barry (1983), citing numerous primary sources, summarized inferred trends in summer temperature and annual precipitation across the continental United States about the time of the Glacial Maximum. Much of the interior [of the United States] south of the Laurentide ice sheet apparently was colder and drier than today, with differences in summer temperatures ranging from 5°C to 10°C [9°F to 18°F] lower than the modern averages."<sup>362</sup>

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<sup>358</sup>Sutcliff, *On the Track of Ice Age Animals, op. cit.*, p. 20.

<sup>359</sup>Cited in H. H. Lamb, *Climate History and the Future, op. cit.*, p. 237.

<sup>360</sup>Jonathan D. Sauer, *Plant Migration*, (Berkeley, Calif., 1988), p. 181.

<sup>361</sup>V. Markgraf, "Paleoclimatic evidence derived from timberline fluctuations," *Le Methodes quantitatives d'étude des variations du climat au cours du Pleistocene*, cited in H. H. Lamb, *Climate History and the Future, op. cit.*, pp. 374-375.

<sup>362</sup>Haynes, *Mammoths, Mastodons & Elephants, op. cit.*, p. 268; see also, R. G. Barry, "Late Pleistocene Climatology, *Late Quaternary Environments in the United States*, (Minneapolis, 1983).

Schultz points out that there is

" . . . evidence that cooling occurred gradually during the long Tertiary Period preceding the Ice Age and then more abruptly during the several glacial stages. This evidence is seen in the soils, plant pollen, marine-life remains in ocean sediments, and other fossils left from those times. Hawaii and New Guinea in the tropical Pacific grew glaciers during the Ice Age and so did many inland mountains in equatorial latitudes."<sup>363</sup>

What those who advocate that while the rest of the Earth cooled while Siberia and Alaska were slightly warmer are suggesting comes down to this: The coldest point in a room heated by a wall radiator is the floor. Heat rises and, therefore, the ceiling is the warmest level of a room. What the advocates of a slightly warmer arctic region during the Ice Age would be suggesting is that the ceiling-equivalent to the equator was cooler, but that the floor space-equivalent to the frigid zone was warmer; and that the middle space of the room between the floor and ceiling-equivalent to the temperate zone was also cooler. There is absolutely no meteorological way to create such a temperate condition either in a room or on a more greatly glaciated Earth. In complete contradiction, what must inevitably follow is that if the ceiling (the equator) is cooler, and the space near it (the torrid zone) is cooler, and the middle space between the floor and ceiling (the temperate zone) is cooler than the floor, the arctic region must also be cooler. And the greatest degree of cooling will be most decidedly found at the arctic region. The inability of uniformitarian scientists to see this fundamental contradiction to the concept that they are proposing is equivalent to denying the laws of meteorological thermodynamics as they apply to the Earth. Yet that is exactly what they are proposing to their colleagues and the public with their warm mammoth steppe theory.

Fagan describes the climate thus:

"To gain some idea of the magnitude of climatic change, one has only to compare the appearance of Northeast Asia and Alaska today with that of 20,000 years ago. Then the earth's northern latitudes were locked in bitter arctic conditions so extreme they were quite unlike any found on Earth today."<sup>364</sup>

"*Duvanny Yar Interval* Some 25,000 years ago, temperatures again declined ushering in a period of extremely dry continental climate in Beringia documented by an exposure at Duvanny Yar on Siberia's Kolyma River. . . . The winters were long, cold, and extremely dry. Strong winds swept across the

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<sup>363</sup>Schultz, *Ice Age Lost*, *op. cit.*, p. 72.

<sup>364</sup>Fagan, *The Great Journey*, *op. cit.*, p. 104.

land bridge, lowering air temperatures by wind-chill factors to depths unimaginable by modern standards."<sup>365</sup> [and adds]

"Make no mistake about it, the Beringian climate was extremely inhospitable and the land-bridge environment probably quite unlike anything now found on Earth. Monotonous expanses of dry arctic taiga and tundra cover much of Northeast Asia and the northern latitudes of the New World today. These are some of the coldest places in the world. At the height of the last glaciation they were even colder."<sup>366</sup>

Each piece of the preceding evidence correlates thoroughly and shows that during the Ice Age the climate on Earth, and especially the arctic, was far colder than it is today. In complete disregard of these contradictions to their mammoth steppe model, its advocates simply cannot face a very simple fact; namely, that during an Ice Age the climate of the polar regions and those regions adjacent to them *must become colder*. Every form of reason and logic, as well as the extant evidence, presents just this view. Winds blowing off ice caps or frozen seas cool the surrounding regions, they do not warm them. There is less direct sunlight and thus less heat in the high arctic latitudes.

Therefore, one might assume that although the mammoth steppe fails to be valid for these basic reasons, these large mammals could have somehow lived instead on a cold arctic tundra.

However, this supposition has been shown to be impossible because tundra vegetation is toxic and not useful for the wide range of herbivores that lived in the arctic. What Velikovsky's hypothesis requires is that the geographical poles were much more perpendicular to the plane of the ecliptic, and that the arctic region was inside the temperate zone which had expanded during the 5,000 years or more that followed the close of the Ice Age when he posits the mammoths and other megaherbivores lived there. But once again, this supposition must be supported by the evidence. If the mammoth did indeed live on the tundra, the vegetation found with it and in their stomachs, wherever recovered, should give undeniable proof for this. If Velikovsky's poleshift theory is correct, the vegetation found with these mammoths should come from farther south than today and overwhelmingly most of it should be from much farther south than the vegetation of the arctic today. One cannot have mammoths living in a tundra regime but, at the same time, eating vegetation that predominantly grows in a temperate zone. Sutcliffe, on this point informs us,

"Most of the plants represented in the mammoth stomachs and in the sediments surrounding the carcasses are of species that still grow locally or within a few hundred kilometers [south] of the finding places at the present-day. From a study of the pollen in the stomach of the Beresovka mammoth [found at

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<sup>365</sup>*Ibid.*

<sup>366</sup>*Ibid.*, p. 108.

the Arctic Circle] Tichomirov writing in 1960, observed a similarity of plants growing at the present-day to the southwest of the fossil site. . . and Selenovich, writing in 1977, found the closest present-day analogy to the Shandrin mammoth flora 320 km [almost 200 miles] south of that locality . . . Plant remains associated with the 1948 Taimyr mammoth . . . also have a slightly more southern distribution."<sup>367</sup>

The very same condition applies equally to elephants, as Haynes explains. "Starving elephants do not die with empty guts . . . because they eat wood, bark, soils, and whatever else is available to fill themselves."<sup>368</sup>

What Sutcliffe has omitted, with regard to the Shandrin mammoth (found near the Arctic Ocean), is that no one knows if a mammoth could have lived on this diet. R. N. Gorlova, who made an histological analysis of the contents, found that of those elements that could be identified, "80% were herbs, 15% woody plants, 1% mosses, 1% leaves of heather and 5% completely decomposed and unidentifiable plant material."<sup>369</sup>

Because of this, many investigators have assumed that this material was indeed its diet. However, Guthrie goes on to explain,

"Among herbivores, if death is not related to predation it is usually influenced by food. Moose and caribou not killed by predators usually die of starvation—[in winter] they run out of digestible items. Thus, if we know enough about a species' food tolerances, we can appraise death by starvation not only in the case of an empty gastrointestinal track, and much more commonly, when plant materials are present. Most carcasses of starved ungulates, for example, have a rumen filled with vegetation, but it is indigestible vegetation. Since we are just learning what normal food for a mammoth would be, it is difficult to judge whether the vegetation found in the Shandrin mammoth was normal or indicative of an animal literally starving with a full belly."<sup>370</sup>

What Sutcliffe has also omitted is that many of the plants found in the stomach of the Beresovka mammoth are either temperate forest varieties or from southern grasslands, and presently do not grow anywhere in the high arctic. According to V. N. Sukachev, who analyzed the Beresovka mammoth's stomach contents, he found

"*Alopecurus alpinus sin.* The remains of . . . grass. . . .

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<sup>367</sup>Sutcliffe, *On the Track of Ice Age Mammals*, *op. cit.*, p. 115.

<sup>368</sup>Haynes, *Mammoths, Mastodonts & Elephants*, *op. cit.*, p. 118.

<sup>369</sup>Guthrie, *Frozen Fauna of the Mammoth*, *op. cit.*, pp. 27-28.

<sup>370</sup>*Ibid.*, p. 29.

"Measurements of the individual parts of these plants when compared with varieties of the existing species, showed that the variety contained in the food was more closely related to that now found in the FOREST REGION TO THE SOUTH OF THE TUNDRA THAN TO THE VARIETIES NOW FOUND IN THE TUNDRA. . . .

"*Agropyrum cristatum* (L) Bess. Remains of this plant are very numerous in the contents of the stomach. . . .

"The finding of these plants is of very great interest. NOT ONLY ARE THEY SCARCELY KNOWN ANYWHERE IN THE ARCTIC REGIONS, they are even, so far as I have been able to discover, very rare also in the Yukutsk district. . . . Generally speaking the *Agropyrum cristatum* L. Bess IS A PLANT OF THE (RUSSIAN) PLAINS . . . THE GENERAL RANGE OF THIS PLANT INCLUDES SOUTHERN EUROPE.

(IN EUROPEAN RUSSIA IT IS ADAPTED TO THE PLAINS BELT),  
SOUTHERN SIBERIA. . . . (Capitalization added)

"Nevertheless, the variety found in the stomach differs slightly from both the European and Oriental-Siberian varieties found today."<sup>371</sup>

[Guthrie describes]

"A Pleistocene horse found [frozen] . . . in the Indigirka River Basin [in eastern Siberia which] . . . had a stomach and intestines containing 90% herbaceous material of which *Festuca* grasses predominated, along with sedge. . . . The latter [or sedge] was identifiable to species . . . by seeds. . . . This xeric [dry] sedge species [V.V.] Ukraintseva ["Vegetation of the warm late Pleistocene intervals and the extinction of some large herbivorous mammals," *Polar Geography and Geology*, Vol. 4, (1981), pp. 189-203], remarks, is not present in the Indigirka area today, but it is a typical plant in the high dry mountains of central Asia, the Middle East, and Mongolia. She concluded that it was abundant in the area where the horse died."<sup>372</sup>

According to Pielou, a pollen analysis cited by Guthrie showed that in Alaska, with the mammoths were found pollen "that included at least one kind, [of] *gamma grass*, whose modern range is several thousand kilometers to the south."<sup>373</sup> (Emphasis added)

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<sup>371</sup>Charles Hapgood, *The Path of the Pole*, (Philadelphia, 1970), pp. 266-267.

<sup>372</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, p. 259.

<sup>373</sup>Pielou, *After the Ice Age*, p. 151.

Hugh Auchincloss Brown reports this stunning information, that the stomach contents of the Beresovka mammoth contained grasses.

"Nine genre of which were found and help us to establish the climatic conditions under which the animal lived. If the grasses were arctic grasses, the mammoth must have lived in an arctic climate. . . . This problem was submitted to the Smithsonian Institute [sic]. Mr. C. V. Morton, Curator, Division of Ferns, Department of Botany, advises that *all the grasses are now found in temperate climates*, none in tropical climates, and four of the nine are found [in the temperate zone] as far north as the Arctic Circle."<sup>374</sup> (Emphasis added)

According to Peter James, the "Vegetation in its [the mammoth's] stomach was of a type that now grows in latitudes some 20 to 30 degrees warmer than present-day Siberia."<sup>375</sup>

Nor do mammoths eat evergreen trees which is the only type of tree that grows well above the Arctic Circle. Mammoths do need tree materials to supplement their diets. But Brown shows in "The Academy of Sciences, 1914, Tome 13. That report observes that 'Contrary to popular belief no evergreens have ever been found in the stomach of a mammoth.'"<sup>376</sup>

Guthrie makes this explicit point. "Indeed there are numerous cases of northern Pleistocene sites containing fauna and flora elements *that are found only farther to the south*."<sup>377</sup>

In fact, in 1958 B. A. Tikhomirov found grasses that presently only grow well south of a site in northern Siberia in association with frozen mammoths. The incongruity of such clearly temperate flora together with animals he had concluded live only on tundra drove Tikhomirov to suggest the mammoth had traveled from the far south and somehow did not digest these temperate grasses.<sup>378</sup>

Can anyone imagine a mammoth migrating for hundreds of miles keeping in its gut grasses it had eaten weeks or months earlier? This is clearly absurd, since it was

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<sup>374</sup>Hugh Auchincloss Brown, *Cataclysms of the Earth*, (New York, 1967), p. 21.

<sup>375</sup>Peter James, *Earth in Chaos*, (Brisbane, Australia, 1993), p. 122.

<sup>376</sup>Brown, *Cataclysms of the Earth*, *loc. cit.*

<sup>377</sup>Guthrie, *Frozen Fauna*, *loc. cit.*, p. 248.

<sup>378</sup>B. A. Tikhomirov, "Natural conditions and vegetation in the mammoth epoch in northern Siberia," *Problems in the North*, Vol. 1, (1958), pp. 68-88.

shown in 1975 that elephants keep food in their alimentary canals for only about 12 hours.<sup>379</sup>

In unmistakable terms it is shown that the mammoths did not live on a mammoth steppe nor did they inhabit an arctic tundra environment. In clear and undeniable terms, it has been demonstrated that the mammoths lived in an environment which contained grasses that only grow in "temperate climates." Velikovsky's poleshift concept unquestionably explains this evidence.

If the mammoth lived on Ice Age tundra, the food found in its mouth and stomach would reflect this environment. But this is contradicted by the varve evidence. One must not confuse the Ice Age pollen studies with the vegetation found inside the mammoths. The pollen studies prove that dated varves from the Ice Age contain tundra desert flora not temperate types. Grasses also produce pollen and if grasses grew on the tundra during the Ice Age, that would be reflected in the pollen stratigraphy, but it is not. Therefore, the vegetation that grew which these megaherbivores ingested did not grow during the Ice Age.

The plants that are described are found today in temperate forest or plain regions well south of the tundra. Based on the migration of the floral belts, what we have is that the mammoth was living in an environment that exists well to the south, to the forests and grasslands of the south. It makes perfectly good sense to suggest that these belts had moved northward when the mammoth lived in the arctic. But most significantly, this rich vegetation is known to have grown in the north during the hypsithermal from 8,500 to about 3,500 years ago. No such rich flora grew there during the Ice Age, as the palynologists insist.

If the mammoth ate tundra vegetation, then it would have had to eat much more of it than modern elephants, who presently live in the lower latitudes with diets of higher nutritional value.

As pointed out above, tundra vegetation is of very poor quality, compared with that of the temperate and tropical latitudes. Requiring more vegetation to live, the mammoth would wear down its teeth more rapidly and at an earlier age than modern elephants.

Robert Bell, nevertheless, points out,

"Falconer insists on the importance of the fact that, throughout the whole geological history of each species of elephant, there is a great persistence in the structure and mode of growth of each of the teeth, and this is the best, single character to distinguish the specimens from one another. He finds, after a critical examination of a great number of specimens that, in the mammoth, each of the

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<sup>379</sup>R. M. Laws, *et al.*, "Elephants and their habitats: The ecology of elephants in North Bunyoro, Uganda" (Oxford, Eng. 1975).

molars is subject to the same history and variation as the corresponding molar in the living Indian Elephant."<sup>380</sup>

The wear on teeth of mammoths and Indian elephants are the same at any particular age, suggesting that they both ate similar forms of vegetation in the same amounts. If the mammoth had been eating low nutritional tundra plants, needing more of these to sustain itself every day, year in and year out, this would be seen on the wear of its teeth. This is not at all the case, which supports the conclusion being presented here, that these ancient elephants lived in the arctic when temperate vegetation grew there; that is, during the hypsithermal.

This evidence is corroborated by the types of animals that also inhabited the arctic region with the mammoth. We have discussed temperate mollusks found there and Guthrie adds to this that, during the Ice Age, one can "point to the steppic character of many insects from the last glacial . . . ." <sup>381</sup> As Sanderson explains:

"The essence of the whole matter is the study of the linkage that exists between faunas and floras through the climatology of their environment. . . . It means that groups of animals go with, or are found among, certain groupings of plants, or plants grouped in a certain manner, by reason of the particular little 'climates' that these groups of plants create. For example: the birds and beasts and insects found in a pine forest are distinctive, and are there—and *always* there—owing primarily to the kind of light, the temperature range, the amount of wind and moisture and so forth that are characteristic of that forest and which suit them—and thus, indirectly, owing to the pines themselves, which bring about this particular combination of conditions."<sup>382</sup>

Not only do trees and grasses give a picture of the climate and range of temperature, light, moisture, etc., but animals are also indicators of the climate. Therefore, if Velikovsky is correct, the overwhelming number of animals dwelling in the arctic along with the mammoth should also, as with the grasses that were found, exhibit that they are temperate types, not just taiga or northern pine forest types, but fully temperate forms. Owen-Smith makes this quite clear: "Species that today exist only in the central and southern United States coexisted in Pleistocene fauna assemblages alongside species now occurring only in the far north of Alaska and Canada."<sup>383</sup> Guthrie adds:

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<sup>380</sup>Robert Bell, "On the Occurrence of Mammoth and Mastodon Remains Around Hudson Bay," *Bulletin of the Geological Society of America*, Vol. 9 (June 22, 1898), in Hapgood, *Path of the Pole*, *op. cit.*, pp. 254-255.

<sup>381</sup>*Ibid.*, p. 248.

<sup>382</sup>Ivan T. Sanderson, *Living Treasure*, (New York, 1941), p. 116.

<sup>383</sup>Owen-Smith, *Megaherbivores*, *op. cit.*, p. 287.

"Large—and medium-sized mammals provide the most striking examples of species found in Alaskan late Pleistocene deposits *but which now live much farther south*. In addition to the bison, horse, hemionid, and saigas . . . [were found] American badgers . . . and Eurasian steppe ferrets . . . , *whose counterparts are today restricted to more mid-latitude grasslands. . . .*"<sup>384</sup>  
(Emphasis added)

Now, where do present day American badgers live? On page 249 of *Frozen Fauna of the Mammoth Steppe*, Guthrie exhibits a map indicating that during the Pleistocene, they lived in central Alaska, but today they range from south central Canada to the southern border of the United States and Mexico, ranging farther south into Mexico. How could these truly temperate animals change their range if the climate of the arctic region was only a little warmer than today as posited by the mammoth steppe advocates, or colder than today as posited by the arctic tundra advocates? These animals could not have lived over a thousand miles north of their present habitats under either of these conditions.

Typical of the inversion of evidence presented by uniformitarian establishment scientists about the nature of the types of animals that lived in the arctic is this statement by Dorothy B. Vitaliano:

"As for the arguments for an overnight shift into a colder climatic zone, if, prior to their demise, the mammoths were living in a mild climate, why were they all wearing such heavy wool coats? And why are the other animals whose remains are found with theirs also overwhelmingly of species which are at home in a cold climate, like the mastodon, moose, bear, musk ox, yak, bison, and wolf, to name a few?"<sup>385</sup>

However, speaking of western Siberia, Haynes tells us, "Mammoths are not the most abundant taxon in the vast number of sites from the late Sartan time interval (approximately coeval with the Late Wisconsin in North America). Horse, deer, bison and sheep outnumbered mammoths at most bone sites, with a few notable exceptions."<sup>386</sup> These are temperate species.

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<sup>384</sup>Guthrie, *Frozen Fauna*, *loc. cit.*

<sup>385</sup>Dorothy B. Vitaliano, *Legends of the Earth*, (Bloomington, Ill., 1973), p. 280.

<sup>386</sup>Haynes, *Mammoths, Mastodonts & Elephants*, *op. cit.*, p. 210.

Graham Hancock citing A. P. Okladnikov, states that, "of the thirty-four animal species living in Siberia . . . [during the Ice Age]—no less than twenty-eight were adapted *only to temperate conditions*.<sup>387</sup> (Hancock's emphasis)

Guthrie argues in this respect with regard to temperate animals.

"No areas of unglaciated Alaska have produced fossils of Pleistocene large mammals. . . . I gathered from talking to Soviet paleontologists that this is true for Siberia, as well. There are literally hundreds of Pleistocene large-mammal fossil locations in Beringia, and these invariably produce the same [grass eating] grazers, particularly bison, horses, and mammoths.

"This is not the entire story, however. Not only are the fossil GRASS LAND MAMMALS found in a coarse grain' scattered across a large area, but normally the dominant species occur together locally. . . . Species composition does not always return the same proportion; for example, bison and sheep tend to increase in the uplands. . . . In some areas, a species drops out . . . or changes in a geoclineal gradient so that a niche is occupied by another related species (red deer . . . in the west and wapiti [elk] . . . in the east), but, for the most part, the mammalian community retains its character. This is especially true for mammoths, bison, and horses, their co-existence in individual sites suggests that these key species . . . were not mutually exclusive in spatial distributions, or chronologically exclusive, but were indeed adapted to coexist on a very local scale."<sup>388</sup> (Capitalization added)

Here Guthrie argues that temperate grass eaters are the predominant fossil species found at all broadly scattered and local sites of Alaska and Siberia, along with others, such as red deer and elk, which are also large temperate grass eating mammals. Since this is true, it becomes clear that nearly all of Beringia was a haven for temperate, grass eating megaherbivores, which is just what Velikovsky's theory suggests it was. These animals were adapted only to temperate conditions.

The very same applies to horse, bison, sheep, badgers, American ferrets, European steppe ferrets, temperate insects and temperate mollusks.

One problem, beyond that of finding sufficient food on tundra for temperate animals, is that of maintaining warmth during an Ice Age. Chris Lavers' *Why Elephants Have Big Ears* outlines the problem related to Vitaliano's conclusion noted above. Thick fur, thick body fat, and heat exchange are the main factors that allow arctic mammals to deal with polar cold. For example:

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<sup>387</sup>Graham Hancock, *Finger Prints of the Gods*, (New York, 1995), p. 215.

<sup>388</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, p. 239.

"In the depths of winter an arctic fox's pelt may be 5.1 cm (2.1 inches) thick—remarkably luxuriant for an animal of such [small] size—and the fur itself is very dense, with a fine wool undercoat."<sup>389</sup>

Polar bears also have long fur pelts but,

". . . despite being 7cm (2.7 inches) thick [slightly longer than that of the arctic fox, it] . . . has quite a low insulation value similar to temperate foxes and rabbits. . . . The main reason for their paradoxical fur is probably that they regularly swim in icy polar waters. When a polar bear enters the sea, the insulation value of its fur efficiently drops to zero. . . . Bears manage to survive in ice water mainly because of a thick layer of fat beneath the skin which also compensates for the fur's relatively poor insulating qualities on land."<sup>390</sup>

The problem of maintaining body heat in the coldest weather is halting its loss from feet and legs that extend beyond a mammal's body, and the paws that are in contact with the frozen ground or ice. Arctic fox, caribou and other arctic animals keep heat from flowing out of their bodies through their legs and feet by having the warm blood in their descending arteries close to the veins with cold blood coming from their feet.

"The thermal gradient between the two causes heat to flow out of the descending [artery's] blood [into that of the ascending vein's blood] before it reaches the feet . . . [thus] a husky's body remains at 38°C [while] the temperature [of] its paws is often close to zero. The temperature between paws and snow is thus minimized so that little heat escapes. . . .

"Keeping legs and feet cold is a very effective way of preventing heat loss."<sup>391</sup>

The problem for horses, bison, and other temperate mammals living in the high arctic has to do with their newborn and very young foals and calves somehow maintaining body heat. "Small animals do not have the stature to carry large amounts of fur or fat, and they lose heat rapidly through their relatively large surfaces."<sup>392</sup> Therefore, highly specialized processes or behavior are required by musk oxen and caribou to give birth to the small offspring in the short arctic summer, because in a month or two after birth, these newborns will face frigid conditions that demand that they keep their small bodies warm.

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<sup>389</sup>Chris Lavers, *Why Elephants Have Big Ears*, (New York, 2000), p. 104.

<sup>390</sup>*Ibid.*

<sup>391</sup>*Ibid.*, pp. 106-107.

<sup>392</sup>*Ibid.*, p. 108.

"Polar bears give birth in late December to early January when air temperature in the Arctic can fall below 40°C (minus 40°F). Cubs weigh only 700 grams (1.5 pounds) at birth and they are blind, wet, lacking in fur and fat, and cannot shiver [to keep warm]. Such defenseless animals could never survive exposure to the Arctic elements. Pregnant females dig dens in the snow and keep them warm by curling up and clasping her front and back paws together pressing her cubs to their warm bodies . . . and may warm the cubs with her breath as well."

The cubs suckle the mother and grow large enough by spring when the hibernation period ends allowing them to emerge weighing enough to survive the spring, summer, and fall seasons so that by the next winter, they have sufficient fat on their bodies to hibernate with their mother for another winter. This behavior allows these young bears to survive in the high arctic. Of course, caribou and musk oxen that stay in the arctic region all year but do not hibernate require other methods for their small calves to live. Caribou calves are protected from the cold when born in spring by

". . . a pelt of air-filled hairs that provides good insulation so long as it remains dry. When cold winds and rain batter the breeding grounds, calves can elevate their rate of heat production by a factor of five, but even with these thermoregulatory abilities, are particularly vulnerable to the combined effects of wind and rain, so mortality tends to be high in years of bad weather."<sup>393</sup>

With respect to musk oxen calves, the situation is somewhat similar to that of caribou.

"Calves are well insulated with long fur that, unusually for mammals, extends down to cover the spindly legs [adding to the warmth of these appendages]. Musk oxen are born with vast deposits of brown, adipose tissue in their abdominal cavities, the sole function of which is to produce heat by metabolic reactions. This tissue allows the calves to increase their overall rate of heat production by 50 percent . . . to a level of thirteen times a human at rest. With these adaptations, a newborn calf can immediately raise body temperature to 75°C (135°F) above that of its surroundings."<sup>394</sup>

Horses and bison living in Alaska and Siberia would also have to bare their foals and calves on tundra, at best. Their offspring would have to grow sufficiently large and lay down a layer of fat to protect them from the long, brutal winter, and do so during a very, very short season of arctic warmth. Farther to the south, where these temperate animals can live today, their foals and calves, born in spring, have a full six to eight

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<sup>393</sup>*Ibid.*

<sup>394</sup>*Ibid.*, pp. 109-110.

months in which to grow large, to lay down not only weight, but a layer of fat and coats long enough to endure a far, far shorter and less inhospitable winter than that in the arctic.

The view that large temperate animals could thrive in the arctic with polar bears, musk oxen, arctic fox and caribou that are fully adapted to be born and survive in such an inhospitable environment, from this author's point of view, is just another form of fiction.

Assemblages of animals do tell us about the climate and the vegetation that grows in a region. For example, Lister makes the following point about a species of early mammoths of Europe dated to about 1.5 million years ago.

"*M. Meridionalis* was living in a time of mild climate, generally as warm or slightly warmer than Europe experiences today. Deciduous mixed woodland provided its habitat and food, which comprised mostly tree-browse: oak, ash, beech and other familiar European trees, as well as some that are now exotic to the region, such as hemlock, wing nut and hickory. . . .

"Alongside it lived numerous other exotic animals such as [North African and Middle East still extant] porcupines, [and] comb-antlered deer, zebra-like horses, small rhinoceroses and primitive pigs and cattle."<sup>395</sup>

What Lister suggests is that the types of animals and plants go together and are evidence that the climate of that time was warmer than presently. But with the very same evidence of saigas, which are a form of horse, badgers, ferrets, bison, and antelope, which are all indisputably temperate animals that presently inhabit the United States, it is impossible for Guthrie, Lister, Vitaliano, Sutcliffe, etc., to realize that these associated organisms with mammoths indicate that the climate in which they lived together had to be the same that exists today in the United States. Are we to accept that the animal and flora assemblages that explain the climate for this ancient mammoth are valid when, as shown above, but that the temperate animal and temperate floral assemblages with Beringian mammoths do not indicate a temperate climate?

The point I wish to stress was actually made by Charles Lyell in the 1830's in his first edition of the *Principles of Geology*:

"Bones of mammoths have been recently found at North Cliff, in the county of York, in a lacustrine [lake sediment] formation, in which all the land and fresh-water shells, thirteen in number, have been accurately identified with species and varieties now existing in that country. Bones of the Bison, an animal inhabiting a cold or temperate climate, have also been found in the same place. That these quadrupeds, and the indigenous species of testacea [shelled animals] associated with them, were all contemporary inhabitants of Yorkshire (a fact of greatest importance in geology), has been established by unequivocal proofs . . .

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<sup>395</sup>Lister, *Mammoths*, *op. cit.*, p. 24.

indicate that there has been little alteration in the temperature of these latitudes since the mammoth lived there."<sup>396</sup>

Tudge along the same line of thought explains:

"Near Oxford, England, Adrian Lister of Cambridge University has discovered late-Pleistocene mammoth bones from a former riverbed in association with the shells of Mollusks—mollusks of a species that now live only in the Mediterranean or the Nile. Here, in short, the mammoth flourished in a climate [in England] more balmy than today's."<sup>397</sup>

The fact of greatest importance that Lyell and Lister understood had been established is that temperate mollusks found together in the same strata as mammoths was clear evidence that the climate had to be temperate when the mammoth lived in Yorkshire. But by the same token, the temperate mollusks found in Siberia and Alaska in strata in which mammoths have been discovered is also clear evidence that the climate there was fully temperate. Add to this fully temperate insects and the case for temperate climatic conditions in the far north during the time of the existence of these elephants becomes overwhelming. All the temperate types of plants, trees, temperate mammals, temperate mollusks, temperate insects found in the same facies as the mammoth indisputably prove that the arctic was fully temperate when the megaherbivores lived there. There is no escape from this conclusion unless one wishes to deny all of ecological theory and fact.

On what basis, then, is it thought that mammoths were animals that could tolerate extremely cold climates?

According to Chadwick,

"Woolly mammoths . . . were well adapted to the demands of the subarctic steppes of North America and Eurasia. . . . Generally speaking, as mammals of a given type extend northward in range, their bodies increase in bulk, while the total amount of exposed surface area is reduced, the better to conserve precious heat. Woolly mammoths fit this pattern known as Bergman's Rule. Compared to other elephant family members, their body was somewhat compressed from head to rump, and their trunk was slightly shorter. They had small ears and a tail not much longer than a deer's. They also had the same kind of double fur coat as found on large mammals in northern climes today: a dense, insulating, inner coat of fine wool covered by a long shaggy coat of coarse guard hairs, such as you might see blowing sideways on a musk ox or mountain goat in

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<sup>396</sup>Charles Lyell, *Principles of Geology, op. cit.*, p. 96.

<sup>397</sup>Tudge, *The Time Before History, op. cit.*, p. 301.

the northern wind. For extra insulation, woolly mammoths had a three-inch-thick fat layer under the skin, plus a reserve of fat stored in the hump above the shoulders. Judging from the way the trunks swept down to form a broad bow close to the ground, they might have been important in plowing snow away from food supplies."<sup>398</sup>

The usual evidence proposed for this supposition was fully outlined and answered by Hans Kraus in his privately published book, *The Mammoth In Ice and Snow*.<sup>399</sup>

"Kraus shows that none of the eight characteristics of the mammoth that have been cited as evidence for adaptation to cold is either a valid or reliable index. The characteristics include small ears, long curved tusks, short legs, long hair and thick skin, short tail, anal flap, fat hump, and thick layer of fat beneath the skin.

"For example, the short ears, short legs and short tail are unreliable indicators because they do not vary consistently with latitude in comparison among rabbits and foxes. That is, a rabbit in a cold climate can have a larger ear than one in a warmer climate, when the opposite would be expected. (Kraus, pp. 16b-25.) *The curved tusks which allegedly were used to clear snow during winter foraging, show abrasion comparable to tusks of present-day elephants which do not engage in shoveling activity.* [author's emphasis] (Kraus, pp. 26-33.) No living arctic mammal relies on subcutaneous fat for insulation. Land animals tested in the middle of winter possessed no thermally significant layer of fat beneath the skin. (P. F. Scholander, *et al.*, "Body Insulation of Some Arctic and Tropical Mammals and Birds," *Biological Bulletin*, Vol. 99, (1950), pp. 232-233, 266 cited in Kraus, pp. 92-94). Unlike the mammoth, no hoofed grazing animals in the arctic today have shaggy leg hair which would interfere with movement through snow. Contemporary grazing arctic animals with short leg hair are able to minimize heat loss by lowering the temperature of their legs by controlling both the flow and temperature of blood in them. (Kraus, pp. 53-60)

"As [one of] the largest living, grazing arctic land animal—and in contrast to the mammoth—the caribou possesses both hair erector muscles and sebaceous glands. (Kraus, p. 52) The mammoth's alleged adaptation to cold is a misconceived conclusion, unsupported by the facts."<sup>400</sup>

Clearly the mammoth, based on Kraus' carefully researched evidence, was not an arctic animal, as Guthrie, Haynes, and Okladnikov delineated above with respect to all the other temperate animals that dwelt in the arctic with the mammoths.

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<sup>398</sup>Chadwick, *The Fate of the Elephant*, *op. cit.*, pp. 26-27.

<sup>399</sup>Hans Kraus, *The Mammoth In Ice and Snow*, (Stuttgart, 1978).

<sup>400</sup>C. Leroy Ellenberger, "Replies," *KRONOS*, Vol. VII, No. 4, (Summer 1982), pp. 73-74.

The most extraordinary aspect of the argument that mammoths were well suited to the arctic climate during the Ice Age because they possessed small ears and tails is the contradiction described by Kavalier.

"It is easy enough to recognize the positive advantages of having small paws, tails and ears in cold weather. Any parts that stick out and are the farthest from the internal organs get the coldest and are the hardest to rewarm. It stands to reason that a bird with a neck like a swan or a mammal with a trunk like an elephant . . . would be hard pressed to keep the protuberances warm."<sup>401</sup>

If the woolly mammoth and those others lived in the arctic or near the arctic, they would surely have developed very short trunks to match their small ears and short tail. But this is clearly not the case. While uniformitarian scientists concentrate on the reduction of the woolly mammoth's ears and tail they cannot look this giant squarely at its long trunk.

But what, then, of the horse, bison, antelope, etc., that survived the Ice Age? They also inhabited the very same northern regions as the woolly mammoth. They presently only inhabit much more temperate environments and are never found well above the Arctic Circle. Yet they had not changed their structure at all to survive in such frigid regions. If these animals were truly adapted to very cold conditions, they would be living far north of their present habitats. What the scientists have done is concentrate their focus on the woolly mammoth, woolly rhinoceros, and musk-ox, but have failed to see that their analysis simply breaks down for the horse, bison and antelope that survived the Ice Age, but are unsuited for those earlier, extremely cold environments.

One can only wonder, how mammoths were adapted to a climate which was equivalent to Siberia, but then for other animals in the same region, they were adapted only to climatic conditions quite similar to that of today's temperate zone. The logic that can support such a wildly irrational scenario is wrong. This points to the fundamental ecological fact that all these temperate animals, like all the temperate grasses, thrived together in a thoroughly warm, temperate climate. There is no reasonable, biological or ecological explanation to account for these facts other than that this entire region was in the temperate zone and that a poleshift explains this condition and is in full harmony with this evidence.

Some critics will undoubtedly claim that the argument has gone too far; after all, they may protest there are a handful of mammals that also lived in the arctic such as reindeer, musk ox and a few others pointed out by Vitaliano that live there today and that this fact in and of itself contradicts both the temperate floral and temperate faunal evidence.

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<sup>401</sup>Lucy Kavalier, *Freezing Point*, (London, 1972), p. 60.

But this argument fails to take into consideration that animals are adaptable, and it is known that frigid type genera can adapt their food requirements. The most obvious point overlooked by those that say that arctic type mammals can only reflect an arctic type climate and environment misses the essential point that all these arctic animals live in the arctic during the short, summer that comes to this region.

Again, according to Sanderson:

"The coldness of the Arctic is often exaggerated. It is true that in January the area immediately around the Pole itself has a mean average temperature of some -40F., but there is an area in northern Siberia just outside the Arctic Circle where the average is ten degrees lower. In summer, on the other hand, the Arctic Circle, except for a patch in central Greenland and a small area immediately around the Pole, enjoys an average temperature of between 32° and 60F., which is the *winter* temperature range of the United States, taken as a whole, of western Europe, the Mediterranean, or China."<sup>402</sup>

The temperature described is about the average for the climate of the northern half of the United States from about late September to mid-December of autumn. That is, every land animal that lives on the arctic tundra adapts for a few months of the year to a temperate climate during the summer. This means that they *can* adapt to a temperate climate and environment on a yearly basis.

Vitaliano's list of mammals that are supposedly "at home in a cold climate" includes moose and wolves. But had Vitaliano thought a moment about these animals, she would realize that moose and wolves have habitats not only in Alaska, Canada, and northern Eurasia, but that they also dwell well south into the temperate zone. *The World Book Encyclopedia* states:

"In North America, moose live in Canada and Alaska and southward into the Rocky Mountains to Utah and Colorado. They also live in parts of Maine, Michigan, Minnesota, New Hampshire, and North Dakota."<sup>403</sup>

All these regions in the United States enjoy fully temperate springs, summers, and autumns where temperatures climb into the 80s and 90s Fahrenheit. This shows moose can live in fully temperate climates. With respect to the wolf, the same encyclopedia explains:

"Almost all wolves belong to a [one] species called the *grey wolf*. There are two chief types of grey wolves, the *timber wolf* and the *tundra wolf*. The

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<sup>402</sup>Ivan T. Sanderson, *Animal Tales*, (New York, 1946), p. 122.

<sup>403</sup>"Moose," *The World Book Encyclopedia*, Vol. 13, (Chicago, 1998), p. 798.

timber wolf lives in the wooded subarctic regions. The tundra wolf, also called the *Arctic wolf* or *white wolf*, makes its home on the treeless plains of the tundra.

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"Wolves can live in almost any climate."<sup>404</sup>

The arctic and timber wolf are "one species," and can mate to produce viable offspring, which can adapt to a great range of environments. Since this is so for these organisms, one cannot exclude, *a priori*, the ability of these other northern denizens listed by Vitaliano from being adaptable to more southern climates, as well. But this is the entire thrust of Vitaliano's statement.

Although temperate animals can adapt to cold winters, they cannot adapt to those winters of the high arctic because if they could, they would do so presently. The fact that moose and wolves live today in both the frigid zone and at the same time in the temperate zone is clear evidence of this adaptiveness. Whereas horses, bison, etc., cannot survive in the arctic zone living on tundra forage, arctic type land animals can adapt to temperate conditions if required to. I suggest that all temperate type land animals would not adapt to arctic conditions. In fact, the invention of the mammoth steppe was an attempt to create just enough of a temperate environment in the arctic for it to be suitable for the many well-known temperate animals that did inhabit this region with the few frigid types.

But this climatic invention is unnecessary, because a temperate climate across the arctic basin created by a poleshift will permit both arctic and temperate types to live there. As pointed out by Pielou, mammals supposedly living together before the end of the Ice Age adapted after it by moving into completely new environments. She shows that the smoky shrew that now lives in developed eastern North American forests, the Ungava lemming that now lives on the tundra, the thirteen-lined ground squirrel that now lives on the prairies, and the heather vole that now lives in the boreal forests of Canada, once lived together, since their bones commingled are found in a cave in Pennsylvania. Today, they each live in geographical regions that are separate from one another. In essence, we have an organism from the tundra, one from the boreal forest, one from the prairie, and one from the deciduous forest living together; then, after the extinction episode, they each survived in totally different separate geographical locations and separate environments.<sup>405</sup>

One of the great problems of the extinction is simply the fact that both temperate and frigid genera inhabited the same environment prior to their destruction. But if there was then a temperate zone climate, then both types of animals could survive in the arctic. Conversely, if there was a frigid zone climate in that region than both types of animals could not survive there. If this form of reasoning and evidence is in error, I ask: What enabled these four animals from the tundra, boreal forest, prairie, and deciduous forest to live together but to only survive in four totally different geographically separate and

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<sup>404</sup>*Ibid.*, Vol. 21, p. 377.

<sup>405</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 263, see also, Kurten, *Before the Indians*, *op. cit.*, p. 142 ff.

environmentally separate regions? If they were once able to live together in one environment, their adaptations would have caused their present environments to greatly overlap to some large extent. It is much more reasonable to suggest that they, like mammoths and temperate animals, lived together in an environment suited best to the organism that requires and demands warmth than to the one that can tolerate the cold, and when that environment was destroyed, those that found themselves in a new environment where they could adapt did so.

Now, if this scenario is correct in certain refuges in the arctic where it has stayed warm enough, temperate organisms would be able to survive, but would be separated and disconnected from the same species by the change. Pielou outlines this evidence.

"Because of these warming influences, summer sea-surface temperatures at the height of the hypsithermal were probably greater than eighteen degrees Celsius as far north of cape Breton Island and into the Gulf of Saint Lawrence; nowadays they are less than fifteen degrees Celsius from about Bangor, Maine northward, except in the enclosed southwestern embayment of the Gulf of Saint Lawrence around Prince Edward Island. [About 4° Celsius equals about 7.2° Fahrenheit.] There, summer warmth continues; it has not decreased appreciably since the hypsithermal, despite the general climatic cooling, because the water is too shallow to be affected by deep-water currents. Consequently, a variety of [more temperate type] organisms, such as some sand fleas, a mud crab and a marine snail, now have disjunct ranges; they are found along the Atlantic shore from Maine southward and in the southwestern Gulf of Saint Lawrence, but not between. Presumably, their ranges were uninterrupted at the height of the hypsithermal."<sup>406</sup>

Here it is made clear that *temperate species can only survive in a temperate climatic environment, but never in a frigid one*. This points to the concept that temperate species can only live in temperate conditions and that the many temperate species that lived in the arctic with the mammoth did so because the arctic had to be a temperate region.

Before proceeding, it is important that one distinction be made; there are indeed fossil assemblages of fauna that come from extremely different climatic zones. These Velikovsky aptly described in *Earth in Upheaval*, wherein he pointed to animals from what could only be considered tropical regions found together with those of the arctic. These groups of organisms he correctly understood could only be brought together by immense cataclysmic floods.<sup>407</sup>

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<sup>406</sup>Pielou, *After the Ice Age, op. cit.*, pp. 277-278. [Pielou in *Biogeography*, presents a great deal of evidence regarding other organisms isolated in disjunct environments.

<sup>407</sup>Immanuel Velikovsky, "Tidal Wave," *Earth in Upheaval, op. cit.*, pp. 50-67.

But what ultimately proves that mammoths were extremely well adapted to warm climates, as was shown earlier, is that the last interglacial created a climate in Europe, Asia and the Americas that was much warmer than today. Cesare Emiliani pointed out tropical red soils developed in North America in the mid-continent as well as southern Europe, whereas temperate soils are brown.<sup>408</sup>

Velikovsky described this prior interglacial period by discussing the hippopotamus:

"The hippopotamus inhabits the larger rivers and marshes of Africa; it is not found in Europe or America, save in zoological gardens, where specimens of it wallow most of the time in pools, submerging their huge bodies in muddy water. Next to the elephant, it is the largest of the land animals. Bones of hippopotami are found in the soil of Europe as far north as Yorkshire, in England. . . .

"In the Victorian cave near Settle, in West Yorkshire, 1,450 feet above sea level, under twelve feet of clay deposit containing some well-scratched boulders, were found numerous remains of the mammoth, rhinoceros, hippopotamus, bison, hyena, and other animals.

"In northern Wales, in the Vale of Clwyd, in numerous caves, remains of the hippopotamus lay together with those of the mammoth, the rhinoceros, and the cave lion."<sup>409</sup>

Robert L. Peters and Joan D. S. Darling, in contemplating the warmth that accompanied the last interglacial period when the temperature was warmer than the Holocene hipsithermal, claim that the world was like a garden.

"Osage oranges and pawpaws grew near Toronto, several hundred kilometers north of their present distribution; manatees [sea cows, now of Florida] swam in New Jersey; tapirs and peccaries foraged in Pennsylvania and Cape Cod had a forest like that of present-day North Carolina."<sup>410</sup>

In essence, for thousands of years during the last interglacial period, the mammoths of Europe, Asia and the Americas thrived in temperate, subtropical, and tropical climates. Thus, there is absolutely no reason to require or demand that the mammoth was adapted only to a cold, arctic environment. That is, about 125,000 years ago, the very same types of mammoths under discussion had been thoroughly immersed

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<sup>408</sup>Cesare Emiliani, *Planet Earth*, *loc. cit.*

<sup>409</sup>Velikovsky, *Earth in Upheaval*, *op. cit.*, pp. 28-29.

<sup>410</sup>Jonathan Weiner, *The Next Hundred Years*, (New York, 1990), p. 178.

in tropical, subtropical, and temperate climate habitats. In view of all this evidence, it is unquestionably clear that the mammoth was fully adapted to temperate climatic regimes. Reason must reject as illogical all the previously discussed uniformitarian conclusions because they all contain blatant contradictions.

Allow me to recapitulate the evidence in order to examine what it proves precisely as related to the mammoths and other mammals in the far north. The evidence proves:

1. ***The mammoths did not and could not live in the arctic on a mammoth steppe during the Ice Age.*** The pollen evidence categorically proves that the arctic was covered by a tundra desert. The evidence from climate research corroborates this conclusion by showing that the climate of the arctic was much too cold to allow a mammoth steppe to exist.

2. ***The mammoths did not and could not live in the arctic during the Ice Age on an arctic tundra.*** The research on present tundra categorically proves that tundra vegetation is poisonous and unpalatable and lacks nutritional value to support them and the other mammals. The evidence from grasses taken from a mammoth corroborates this conclusion by proving that this vegetation was a fully temperate genera. Fully temperate grasses and fully temperate mammals do not and cannot survive on Ice Age tundra. Both 1 and 2 above prove ***the mammoths did not live in the arctic during the Ice Age.***

3. ***The fully temperate grasses growing in the arctic proves that when the mammoths and other temperature fauna lived there, this region had a fully temperate climate.*** During the Ice Age there was no such climatic condition (mammoth steppe) in force in the far north and, therefore, it must follow that neither the mammoth nor the other temperate mammals living with it ever lived in the arctic during the Ice Age. They had to live there either when its climate was temperate, meaning during the hypsithermal period. Furthermore, this evidence is also important as it relates to the arrival of man in America. In order to maintain that the paleo-Indians arrived in the Americas via the Bering land bridge it is assumed that they had to have been in Alaska about 20,000 or so years ago to travel into the heart of the northern part of the continent about 12,000 years before the present. But, now this scenario simply does not stand up and is contradicted by the facts that there was no mammoth steppe in Beringia 20,000 years ago. The region being a polar desert lacked sufficient vegetation for megaherbivores and could not provide food even for a small human population to subsist. Thus, the people who did migrate to America from Siberia had to have done so at an earlier interstadial or interglacial period.

This evidence coincides with and corroborates the evidence related to linguistics, genetics and hematology. Linguistics, genetics and hematology all say that man arrived long before the 12,000 year Clovis barrier. With the palynological evidence added to these others, we find a strong convergence of palynology, linguistics, genetics and hematology all coinciding and corroborating one another.

Flint and the palynologists claimed that the mammoths could have lived in the far north only during the warmer periods of interglacials. But Sanderson more specifically suggests they lived there after the Ice Age ended—in the great warmth known as the

hipsithermal. All authorities agree that the arctic basin became much warmer than today during that time. Therefore, the hipsithermal, it is suggested, is the recent period of time that would be sufficiently warm to permit fully temperate grasses to grow in the arctic upon which the temperate megafauna could feed for thousands of years.

What must also be pointed out is that ancient man could not have crossed the Bering land bridge 12,000 years ago because the land was a frozen tundra which could not support the animals or flora upon which he depended for sustenance. Since there wasn't a flora capable of supporting man or feeding the large and small game upon which it is assumed early man himself fed, he could not have crossed several hundred miles from south central Asia into Alaska. To make such a long journey requires that ancient man would find food upon which to live as he traveled. Without this basic ingredient necessary for his survival in the lands over which he passed, he could not successfully enter the Americas 12,000 years ago.

Because it has been shown that the mammoth lived in the far north when it lay in the temperate zone, one is left to explain how the conditions necessary to create such an environment as temperate—temperatures and climate, temperate-zone insulation from the sun, temperate-seasonality for growing seasons and temperate-moisture were available at these high latitudes. This I will take up in the chapter titled "Poleshift." Since the mammoths could not endure the arctic during the Ice Age, they did not become extinct at the end of the Ice Age 10,000 years ago. However, if I, following Velikovsky, contend the mammoths lived in the arctic during the hipsithermal, evidence, not deduction, must also corroborate this conclusion.

## THE ENVIRONMENT AND PRESERVATION OF THE MAMMOTH

As was pointed out above by Charlesworth, if forests spread far north during the hypsithermal, it would necessarily follow that the mammoth lived in an environment not only of grasslands, but also of forests. The advocates of the mammoth steppe theory have been denying for some time that there is any evidence that mammoths in the arctic lived in forests. Bernard Heuvelmanns describes some of the evidence which relates to this issue:

"I had . . . a feeling that there was something I had overlooked, or rather something everyone had taken for granted without inquiring whether it was true. And then suddenly I realized what this was: the assumption that *the mammoth was animal of the tundra and the arctic prairies*. (Heuvelmann's emphasis) What is it based on? Apparently on the fact that it is almost always in the tundra that the carcasses of frozen mammoths have been found. But is this sufficient reason? Obviously they are most likely to be frozen whole in these icy and marshy plains; but might they not prefer to live elsewhere? For instance the fact that fossil remains of monkeys, lions, and hippopotami have been found in Europe does not mean that these animals belong to temperate regions. On the contrary, it is taken to imply that our countries once had a warmer climate.

"The present tundra is an exactly similar case. . . . Now it has been shown that the Scandinavian glaciers did not reach beyond the Urals [during the last Ice Age]. In fact the whole of Asia escaped them. Thus the higher temperature was especially marked in Asia where the glaciers did not come. Therefore, it is likely that the taiga, the vast forest which covers all the middle of Siberia, once stretched farther north and covered the very place where most of the remains of mammoths were found. Must not the temperature have been milder to lead such animals as elephants and rhinoceroses to venture into these regions?

"The analysis of the Beresovka mammoth's stomach contents shows that at the end of the summer it ate typical [temperate] meadow flora. . . .

"The theory that the mammoth belong to the forests was confirmed after the original edition of this book was published, by the recent work of the Soviet academician, E. N. Pavlovsky on a mammoth's carcass [sic] partly dismembered by beasts of prey, which was excavated in 1948 from the banks of the River Marmontova in the Taimyr Peninsula. Vegetation dating from the same period was found beside the animal, chiefly large branches of willow and dwarf birch. This showed that the climate was less severe when the mammoth perished, for

willows are not now found less than 500 miles to the south. Pavlovsky (in "Quelque Considerations sul les Conditions Ecologique de l'Existence de Mammoth," *Ann. Sci. Nat.*, [Zool], [Paris, 1955], [II], 16, pp. 413-418) concludes that the mammoth lived in a country of which at least half was forests and peaty plains. [This suggests half the region was forest and half was grassland.]

"Professor Raymond Vaufrey, of the Institute of Human Paleontology of Paris (in "Probosidiens Fossiles," in P. Grasse *Traite de Zoologie*, Vol. XVII, No. 1, [Paris, 1956], pp. 844-50) sums up the final conclusions, reached after a thorough inquiry by many soviet scientists, as follows: '*The Mammoth is not an arctic mammal*; the climate in the area where its frozen carcasse [sic] is found was warmer than today; the forest zone reached much further north. In the spring and summer it is probable that the mammoths migrated to the north, perhaps to escape being bitten by blood-sucking diptera (as in the case of the reindeer).'<sup>411</sup>

The thesis that mammoths lived in woodland regions is also in full harmony with the present understanding of the ecology of forests and modern elephants in Africa. As we pointed out, elephants destroy trees as they forage the land. This is a well-known process that occurs as part of the ecological cycle of elephants with forests. When elephant populations grow, they begin to destroy the forests.

"The decline of the woodlands is not irreversible, but is part of a long-term, natural cycle in which elephants have always played a role. The theory of natural cycles runs approximately and in its simplest form as follows: elephants knock down trees and bushes, establishing grasslands in their place, but then their numbers decline or they move away to where there are still trees [while many of them die off]. The grasslands now burn every year, preventing the regeneration of young trees; and establishing themselves even more permanently. This provides ideal conditions for grazing animals to increase; they may breed up to such an extent that the grass becomes threadbare. Patches of soil appear, denuded of grass, where the fire can no longer reach. Bushes and trees can sprout on these islands. With no browsers to suppress them, the young woodlands proliferate, becoming the ideal habitat for elephants once more. Perhaps some hundred years after it began, the cycle comes full circle and the elephants begin their demolition once gain.<sup>412</sup>

Therefore, the mammoths would have acted in the forests of Alaska, Canada, Europe, and Asia in the same way. They would be maintaining the ecologic environment not only for themselves and other forest creatures; by constantly destroying forests, they encourage grasslands that support grassland creatures. The ecology is rather simple and

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<sup>411</sup>Bernard Heuvelmanns, *On the Track of Unknown Animals*, Transl. R. Garnett, (New York, 1959), pp. 348-349.

<sup>412</sup>Iain and Oria Douglas-Hamilton, *Among the Elephants*, *op. cit.*, p. 257. See also, Iain Douglas-Hamilton, "African elephants: Population trends and their causes," *Oryx*, Vol. 21, No. 1, (1987), pp. 11-24.

straightforward, and suggests that the present forest ecology of Africa and its periodic destruction by elephants is an example of the ecological setting of mammoths during the hysithermal. That is, species of the same general genre would tend to inhabit similar environments and adapt to it ecologically in a similar manner. Thus, a forest habitat for mammoths makes excellent ecological sense.

Speaking of "Paleolithic times in the Lena River Basin," A. P. Okladnikov points out that wood found with mammoths in that region during the Pleistocene have ". . . exactly the same type of marks . . . left on a tree by beavers [gnawing it down] for constructing a dam. The 'presence of heaps of sticks cut off to one length,' mentioned by Kozmin, is characteristic of the construction of these animals. . . .

"The presence of beavers in eastern Siberia . . . in the remote era of the mammoth and rhinoceros was demonstrated by Cherskiy, who observed that a fragment of a beaver's pelvic bone together with remains of a rhinoceros were both stained the same dark brown."<sup>413</sup>

Now it is obvious that beavers only live in regions with large trees of temperate types. Beavers are animals of woodland regions and not barren steppes. This clearly indicates that the mammoth of Siberia lived in a forested environment with plenty of grassland areas.

Okladnikov further shows that in time of the mammoths in Siberia in the Lena basin, humans used timber:

"[N. M.] Kozmin gives in this report a short account of the remains of a wooden construction, a flooring or *gat* found by him . . . and of his finding nearby, on a high bank terrace, of accumulations of fossil bones of Quaternary animals. He called a *gat* the layer of fossil wood lying at an angle of 20°-25° to the plane and consisting of 'pieces of timber of different lengths and thicknesses, varying from 1 to 50 cm [0.4 to 18 inches] in diameter. He wrote further: 'Considering that the layer of fossil wood was slanted in relation to the plane, while the layers of sand, gravel, and wood above it were horizontal, it is safe to say that it was constructed artificially. . . .' [Perhaps as a lean-to]

"On examining the 'pieces of wood from the *gat*, which were beautifully preserved because of the permafrost,' the explorer also came to the conclusion that they showed clearly preserved traces of chopping with stone axes. . . ."<sup>414</sup>

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<sup>413</sup>A. P. Okladnikov, "Paleolithic Remains in the Lena River Basin," *The Archaeology and Geomorphology of Northeastern Asia*, Henry N. Michael ed., (Toronto, 1964), p. 35.

<sup>414</sup>*Ibid.*, p. 34.

In the Lena Valley in the heart of Siberia at the time of the mammoth have been found beavers and planks which can only come from well-wooded regions.

This is further supported by research of the Shandrin River mammoths, near the Arctic Ocean, which contained a great mass of frozen viscera (some 600 pounds) inside its rib cage. These stomach tract contents were examined by N. G. Solonevich, B. A. Tikhomirov, and V. V. Ukraintseva. Analyzing the pollen and the fragments of easily identified woody plants and mosses, they came to the conclusion that the habitat of the mammoth was analogous to that of modern northern forests.<sup>415</sup>

Thereafter, R. N. Gorlova also did histological [tissue] studies of the vegetative remains of the Shandrin mammoth. She also concluded from these remains that the mammoth lived in a marsh tree-scattered environment. Among the contents she found twigs of larch.<sup>416</sup>

Velikovsky, of course, pointed to D. Gath Whitley's article in the *Journal of the Philosophical Society of Great Britain*, Vol. XII, (1910), page 35. that in "the stomachs and between the teeth of the mammoths were found plants and grasses that do not grow in northern Siberia. 'The contents of the stomach showed . . . undigested food, LEAVES OF TREES now found in southern Siberia. . .'"<sup>417</sup> (Capitalization added)

Even Farrand was forced to admit that "Quackenbush found 'large trees' associated with fossil mammoths in a now-treeless part of Alaska and also came to the conclusion that the climate was somewhat milder when the mammoth lived."<sup>418</sup> The problem is that "large trees" simply do not grow on tundra. The trees that do grow on tundra are low-growing stunted varieties. The problem for the uniformitarians, once again, is that the vegetative-climatic zone of the arctic would have been inhospitable for large trees until the interglacials or the hipsithermal. If the mammoth lived in the far north during the Ice Age, they would not be found in association with "large trees." Schultz makes the same point regarding the lack of tall trees in the arctic during the cold Ice Ages.

"At the height of the last Würm glaciation, tundra conditions prevailed in much of unglaciated western Europe and northern Russia. This was a permafrost belt, AND THERE WERE NO TREES. . . . South of the tundra there was

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<sup>415</sup>N. G. Solonevich, B. A. Tikhomirov, V. V. Ukraintseva, "Preliminary results and investigation of the plant remains from the gastrointestinal tract of the Shandrin mammoth (Yakutsk)." *The anthropogene fauna and flora of northeast Siberia*, O. A. Skarlato, ed., Academy of Sciences of the USSR, Proceedings of the Zoological Institute, Vol. 63, (1977).

<sup>416</sup>R. N. Gorlova, "Macroremains of plants from the stomach of the Shandrin mammoth," *The Mammoth Fauna of the Asiatic Part of the USSR*, N. K. Vereschagin, A. I. Nikolaev eds., Akademiya Nauk, Trudy Zoologicheskologo Institue, Vol. 3, (1982), p. 34-35.

<sup>417</sup>Velikovsky, *Earth in Upheaval*, *op. cit.*, p. 6.

<sup>418</sup>Farrand, "Frozen Mammoths and Modern Geology," *op. cit.*, p. 730.

grassland, combined forest-tundra associations, or mosaics of steppe vegetation and mixed evergreen and deciduous forests, and there temperate forests predominated."<sup>419</sup> (Capitalization added)

However, as V. N. Sukachev earlier informed us, the types of vegetation found in the mammoths' stomachs are "now found in the forest regions to the south" or in "southern Europe." The evidence is, of course, completely unacceptable to uniformitarian scientists and they have been adamant in rejecting it. Nevertheless, this concept was shown to be correct in the last century even by Howorth. In discussing the flora found with mammoths, he wrote:

"It seems that the botanical facies of the district [in which mammoth remains are found] was not unlike that of southern Siberia, that the larch, the willow, and the alnaster were probably the prevailing trees, that the limit of woods extended far to the north of its present range, and doubtless as far as the Arctic Sea."<sup>420</sup>

Elsewhere, Howorth wrote:

". . . during the mammoth period that district . . . was marked by a temperate climate and was probably occupied by forests to the very borders of the Arctic Ocean. This view . . . was finally established when it was shown by Schmidt and others that *rooted trunks of trees are found in the beds containing mammoths' remains* far north of the present range of trees, and that *southern forms of fresh mollusks . . . are also found in the same beds of Siberia* far to the north of any place they now live."<sup>421</sup> (Emphasis added)

Thus, we find good evidence of temperate forests that presently grow in southern Siberia beyond the permafrost belt, and grasses that grow in fully temperate regions, and beavers that live in temperate woodlands all associated with mammoths in northern Siberia and northern Alaska. What is so obviously implied by all these associations is that the climate of Siberia and of the United States was temperate and, therefore, the regions farther to the north of these latitudes had to have been completely temperate. This did not occur during the Ice Age.

On the basis of this evidence, the problem related to the nature of the number of large mammals found in the far north is also resolved. Uniformitarians have been forced

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<sup>419</sup>Schultz, *Ice Age Lost*, *op. cit.*, p. 112.

<sup>420</sup>Henry Howorth, *The Mammoth and the Flood*, *op. cit.*, p. 71.

<sup>421</sup>Henry H. Howorth, "The Climate of Siberia in the Mammoth Age," *Nature*, Vol. 39, (1889), p. 294.

to argue that the number of animals that could be sustained in the arctic were few in number so as to allow them just sufficient vegetative resources to permit them to live. However, many of these mammals tended to live in great herds, like certain animals today, such as caribou and elephants that form herds of about a hundred members. It is entirely reasonable to contend that what exists in savannahs and temperate grasslands today existed during the great warmth of the hipsithermal. Sanderson admits this problem even though the tundra can presently

". . . maintain vast herds of herbivores such as Caribou. . . . *Other beasts of lesser number* but still individually of some size, such as the musk-ox and the Barren Grounds Caribou, can maintain themselves year round at the far northern edge of the tundra belt and even out onto the Barren Grounds. . . .

"However, unless a lot more of some kinds of plants now found thereon and/or many other kinds that do not occur there today, existed in those regions previously, *these lands could not have supported huge herds of mammoths—and especially all year round* . . ." <sup>422</sup> (Emphasis added)

Not only could mammoths and all the others have lived in the arctic in large herds, but they could have done so for thousands of years during the hipsithermal. All these different forms of evidence go together comfortably in terms of this thesis; that the mammoths lived in the arctic in temperate conditions, in temperate grasslands and forests, with abundant floral resources during this great period of warmth makes perfectly good sense.

The thesis presented here is that mammoths, trees, grasses, and the rest of the fauna and flora lived in that region during the hipsithermal and not during the Ice Age, and it is, therefore, incumbent upon this author that he make a fundamental case that this is in fact correct. According to the various uniformitarian advocates of the overkill and climate hypotheses, the end came to these arctic giants 10,000 to 12,000 years ago. Other catastrophists such as Hapgood, Hoyle, etc., offer cataclysmic causes for the demise of these animals, but also claim that they became extinct similarly about 10,000 to 12,000 years ago. *Since it has already been demonstrated above that the mammoths did not and could not have lived in the arctic during the Ice Age, then they could not have died off there for any reason uniformitarian or catastrophic at its conclusion.* But now to address the fact that the extinction occurred 3,000 to 4,000 years ago.

Although it has been amply demonstrated that the hipsithermal was clearly a period of great warmth across the arctic, we must examine the vegetation that grew in the very high latitudes with much greater care to explain the matter. A general description of this vegetation is presented by Dyson.

"It is obvious from the study of pollen profiles that during the maximum warmth of the Hypsithermal interval deciduous [broad-leafed] forests spread

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<sup>422</sup>Sanderson, *The Dynasty of Abu*, *op. cit.*, p. 82.

north in Europe and North America into regions which are far too cold to permit their growth today. In temperate and subarctic zones temperatures were several degrees higher than now, and the *mean annual temperature of Svalbard* [Spitsbergen] *rose above the freezing point.* (Emphasis added)

"In the Alps peat deposits and the remains of forests at least 1,000 feet above the present treeline indicate the relative mildness of the climate during the Hypsithermal as compared with today. If the treeline were so much higher, the snowline, too, must have been far higher than now. Many of the glaciers fed by firn fields [granulated ice] . . . could not have been there during those warmer times. . . .

"The same kind of evidence comes from Iceland. Parts of the land now under the icecap Vatnajokull were clothed with dense forests a few thousand years ago, because the outer glaciers every now and then bring out peat and the trunks of birch trees far larger than any growing in Iceland today. The firnline on Vatnajokull must have been nearly 1,000 feet higher in those warmer times.

"Proof of a correspondingly high snowline is also present in many places in North America. Ever since the glaciers at Glacier Bay, Alaska started their big retreat more than 150 years ago, they have been uncovering the remains of forests destroyed and partially buried in rocky debris when the glaciers made their last widespread advance. In places some trees, now only shattered stumps, have 300 to 400 annual rings, and at the time they were destroyed they were growing on decayed logs from a much older forest."<sup>423</sup>

Two points must be greatly emphasized before proceeding. Dyson has told us that the mean annual temperature of Spitsbergen, several hundred miles north of Europe in the Arctic Ocean and well north of Siberia, was above freezing. The other point has to do with forests and permafrost. According to Pielou, forests of large trees do not grow on permafrost ground because "where permafrost prevailed, forests could not develop until the land was free of it."<sup>424</sup>

A fundamental reason that also explains why the permafrost would melt deeply in all of North America, Eurasia, and Siberian Asia is related to snowfall during the hypsithermal. During this warm period, the amount of water vapor from the Arctic Ocean which had little or no ice cover, would generate snow during the arctic winters just as it does in the temperate zone. Snow acts as a blanket which shields the earth beneath from freezing atmospheric temperatures. According to *Earth News*,

"Alaska is stuck on defrost. A fraction of a degree at a time, the state's frigid foundation—the perpetually frozen ground, or permafrost, that lies a few feet below the surface—is warming up. Now physicist Tom Osterkamp thinks

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<sup>423</sup>Dyson, *The World of Ice*, *op. cit.*, p. 213.

<sup>424</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 88.

he's finally figured out why: like a down comforter a spate of heavy snowfalls has insulated the ground from the cold winter air.

"Osterkamp, a physicist at the University of Alaska in Fairbanks, discovered the warming by sinking temperature probes down a series of boreholes along the trans-Alaska pipeline. At one site near Prudhoe Bay, Osterkamp found the temperature of the permafrost was seven degrees Fahrenheit higher than it had been in previous years.

"There's been no increase in air temperature to account for this warming trend. but snowfall in the interior of Alaska has been much higher than average since the winter of 1989-90. And that thick blanket keeps the chilly air off the ground, thawing the permafrost in half of the state that's south of the Yukon River, Osterkamp says."<sup>425</sup>

The very same phenomenon must also apply to all arctic lands during the warmer hipsithermal. With warmer summers and the Earth blanketed deeply in snow during the winter, the permafrost would have melted significantly.

The question is: Why can't large forest-type trees grow on tundra with permafrost up to the surface year round? Many of the reasons will be analyzed below in our "Poleshift" chapter. One of the major reasons is pointed out by Stonehouse:

"The treeline—where the northernmost trees, of whatever species, never quite achieve full proportions—follows fairly closely the 10C (50F) summer isotherm, suggesting that trees at their ecological limit will grow where summer mean temperatures are above that figure. . . . One issue of vital importance is survival of seedlings. Even if trees at their northern limit produce seeds often, the ground may be inhospitable to them, and their seedings have great difficulty in growing. There may be no recruitment to the forest edge for several years on end."<sup>426</sup>

The ground of a forest must be unfrozen to permit a seed to survive and sink below the surface deep enough to be protected from animals that would eat it, or from surface cold that will destroy it. But Stonehouse tells us "tundra becomes water logged during the spring thaw"<sup>427</sup> And "Boggy tundra supports many species of marshy, water-tolerant plants."<sup>428</sup> Elsewhere, where there are no bogs in the tundra the plants that grow

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<sup>425</sup>"Defrosting Alaska," *Earth News*, (Oct. 1997), p. 14.

<sup>426</sup>Stonehouse, *North Pole South Pole*, *op. cit.*, p. 91.

<sup>427</sup>*Ibid.*

<sup>428</sup>*Ibid.*

are "xerophytic (drought-tolerant) plants"<sup>429</sup> but not tall forest trees. The seed must fall into moist, soft soil which loses its frost in early spring to permit germination. Though small trees, mosses, and lichens grow on permafrost, large trees cannot. The ground must be warmer for a longer time and to a greater depth than the treeline limit of today. Tall trees are not found much beyond the Arctic Circle; they are found well south of it. As Stonehouse further points out,

"The deepest soils, the richest assemblages of plant species and the most complete ground cover occur on the southern tundra where meter-high [39 inches] thickets of shrub alternate with mosses, grasses, heathers and other flowering plants."<sup>430</sup>

The kinds of trees that grow on permafrost in the tundra are small, stunted varieties, as Dyson shows.

"Though permafrost is thickest and most widespread in the Arctic tundra, in certain areas it extends southward far into the forested zone. Trees and other plants with long taproots cannot grow over permafrost, and many of the trees which do grow over it, especially if the active [top] layer is thin, are stunted because the ground is always refrigerated. But dense stands of tall trees—cottonwood, spruce, larch, birch—are present in places where the top of the permafrost is no more than four or five feet below the surface."<sup>431</sup>

Therefore, any animal that dies at the surface of an area with tall trees leaves its carcass bones and, with mammoths, its tusks, on unfrozen soil. The bones, tusks, etc., must work their way down through this unfrozen layer of soil if they are to be preserved in regions with tall trees. In essence, in forest regions in the arctic permafrost would be so extraordinarily rare that many bones and especially tusks could be preserved. Forest soils do not often preserve bones, tusks, etc.

The question that follows, of course, is: How does the fact of the hypsithermal warmth prove that the mammoths did not become extinct 10,000 to 12,000 years ago, but 3,000 to 4,000 years ago? The lines of evidence are quite clear and are related directly to the fact that Spitsbergen had a mean annual temperature above freezing and that tall tree forests do not grow in permafrost ground.

All the arguments or evidence related to the extinction of the mammoths and the preservation of their bodies in permafrost demands that the permafrost in Siberia and

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<sup>429</sup>*Ibid.*, p. 92.

<sup>430</sup>*Ibid.*

<sup>431</sup>Dyson, *The World of Ice*, *op. cit.*, p. 157.

Alaska where their frozen carcasses are found has been frozen for about 10,000 years. A second associated problem for the frozen carcasses is that of the frozen mammoth tusks, which will rot if deposited on warm soil or would be destroyed by solifluction lobes in cold soil. The third associated problem is related to trees found in the permafrost that will rot or become water logged if the permafrost melts any time after the Ice Age ended.

Let us, therefore, begin this analysis with the most durable product, ivory, and its preservation.

According to John White:

"In addition to preserved specimens, hundreds of thousands of mammoth bones and tusks have been found in excellent condition. An estimated fifty thousand tusks were taken from Siberia alone between 1660 and 1915. (It was the lure of 'white gold'—ivory mammoth tusks up to sixteen feet long and weighing nearly four hundred and fifty pounds—that brought collectors to the Arctic tundra. Traffic in fossil ivory has been going on since the time of Pliny the Elder.) One of the world's foremost authorities on Ice Age elephants, Professor Nikolai Vereschagin, chairman of the Soviet Academy's Committee for the Study of Mammoths, and the man who eventually took charge of Dina, estimates that even the fifty thousand tusks represent a small fraction of the mammoth population. According to John Massey Stewart's article, 'Frozen Mammoths from Siberia Bring Ice Ages to Vivid Life,' (*Smithsonian*, December 1978), Vereschagin calculates that 'the heavy erosion of the Arctic spills thousands of tusks and tens of thousands buried bones each year into the sea and that along the 600-mile coastal shallows between the Yana and Kolyma lie more than half a million tons of mammoth tusks with another 150,000 tons in the bottom of the lakes of the coastal plain' (p. 68)."<sup>432</sup>

Several investigators have specifically raised this point and all of them agree that ivory must be frozen soon after burial or it will be destroyed and made useless for carving Sanderson tersely states, "Ivory, being an animal substance, can both dry out and splinter, or rot, and the greater part of the mammoth ivory does one or the other."<sup>433</sup>

Elsewhere he states:

"Elephant ivory of the best quality starts out pure white when fresh but in time degrades in color to yellow and eventually to dark brown. Mammoth ivory, which is scattered all over northern Siberia and Alaska and of which hundreds of thousands of tons have been dug up and exported to both the Orient and the West over the centuries . . . , being 'dead' and very ancient is mostly full of

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<sup>432</sup>John White, *Poleshift*, Virginia Beach, Vir., 1988) p. 20.

<sup>433</sup>Sanderson, *The Dynasty of Abu*, *op. cit.*, p. 90.

cracks and is friable [easily crushed by hand]. However, some mammoth ivory is a pure white, and dense as that of any elephant."<sup>434</sup>

If ivory is not quickly used or frozen quickly after it is deposited in soil, it will dry out, splinter, or rot in the ground. Even Benjamin Franklin wondered about this problem. In discussing mammoths with a correspondent, while he was envoy to England, Franklin noted, "The tusks agree with those of the African and Asiatic elephant in being nearly of the same form and texture, and some of them notwithstanding the length of time they must have lain, being still good ivory."<sup>435</sup>

Charles Hapgood, the catastrophist is emphatic on this point.

"But there is another factor of great importance which has been consistently neglected. It has been overlooked that meat is not the only thing that has to be frozen quickly in order to be preserved. The same is true of ivory. Ivory, it appears, spoils very quickly when it dries out.

"Tens of thousands of skeletons and individual bones of many kinds of animals have been discovered in the permafrost. Among them have been found the enormous numbers of mammoths' tusks. . . . To be of any use for carving, tusks must either come from freshly killed animals or have been frozen very quickly after the deaths of the animals and kept frozen. Ivory experts testify that if tusks are exposed to weather they dry out, lose their animal matter and become useless for carving (see Richard Lydekker, "Mammoth Ivory," *Smithsonian Reports*, (1899), pp. 361-366.)

"According to Lydekker, about 20,000 pairs of tusks, in perfect condition were exported for the ivory trade in the few decades preceding 1899, yet even now there is no end in sight. According to Digby, (p. 177) about a quarter of all mammoth tusks found in Siberia are in good enough condition for ivory turning. This means that hundreds of thousands of individuals, not merely eighty or so, must have been frozen immediately after death, and remained frozen. Obviously it is unreasonable to attempt to account for these hundreds of thousands of individuals by the assumption of such rare individual accidents as has been suggested. . . . Lydekker gives . . . the following passage . . . 'the burial, or at least the freezing, must have taken place comparatively quickly as exposure to their ordinary conditions would speedily deteriorate the quality of the ivory.'"<sup>436</sup>

Cardona further explains:

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<sup>434</sup>*Ibid.*, p. 214.

<sup>435</sup>Robert Silverberg, *Mammoths, Mastodons and Man*, (New York, 1970), p. 60.

<sup>436</sup>Charles Hapgood, *The Path of the Pole*, *op. cit.*, pp. 259-260.

"Ivory is filled with a gelatinous solution which facilitates its carving and contributes to its high polish. This solution can only be found in fresh and instantly frozen tusks. It does not otherwise survive the ravages of time. Yet . . . the tusks which came from the Siberian graveyards 'were as perfect and in as fine condition as if recently killed'."<sup>437</sup>

On the other hand, Flint has claimed:

"These finds have fostered many tales of great catastrophes, for which there is not factual support. Being chemically durable, the tusks long outlast the rest of the fossil skeleton; there is little reason to doubt that they could have accumulated throughout many thousands of years."<sup>438</sup>

But ivory, in a definite sense, is not very different than bone because over time it does decay. And as Guthrie pointed out, "solifluction lobes are thoroughly vegetated. Bones lying in such a vegetated mat are rapidly incorporated by plant outgrowth (usually by moss), then leached and destroyed by root acids."<sup>439</sup> Therefore, these great numbers of ivory tusks, taken from the vast frozen area of Siberia, could not have been deposited on tundra during the Ice Age because they would have been leached and destroyed by root acids in the frozen soil. If they had been deposited in temperate soil, they would rot. But most significantly, useful ivory tusks, to survive, would have to have been buried suddenly and frozen suddenly, just as Hapgood outlined. Therefore, the vast number of ivory tusks had to be buried at a time when there were no solifluction lobes in the arctic that would erode them. This, once again, directly points to the hypsithermal when the permafrost had greatly deteriorated and the soils of the arctic did not have solifluction lobes. It also indicates that all the good ivory buried all across Siberia was buried in soft soil and was almost instantly frozen.

Let us examine this question of preserved ivory from a second viewpoint, from the evidence of another phenomenon. The fact of the hypsithermal presents another major obstacle to the concept that the mammoth carcasses, bones, and tusks lay buried in the soil of the arctic for 10,000 years. All researchers have assumed that these organic remains have lain frozen in the arctic since the Ice Age ended 10,000 years ago. According to Howorth,

"Lyell was constrained to write:—'It is certain that from the moment when the carcasses both of the rhinoceros and the elephant . . . were buried in Siberia, in lat. 64° and 70°N the soil has remained frozen, and the atmosphere as cold as at this day.' Again, he says:—'One thing is clear, that the ice or

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<sup>437</sup>Dwardu Cardona, "Comments," *KRONOS*, Vol. VII, No. 4, (Summer, 1982), p. 88.

<sup>438</sup>Flint, *Glacial and Pleistocene Geology*, *op. cit.*, p. 470.

<sup>439</sup>Guthrie, *Frozen Fauna*, *op. cit.*, pp. 71-74.

congealed mud in which the bodies of such quadrupeds were enveloped has never once been melted since the day when they perished, so as to allow the percolation of water through the matrix, for had that been the case the soft parts of the animal could not have remained undecomposed'.<sup>"440</sup>

Adrian Lister, a lecturer today at University College London and one of the world's leading authorities on the evolution and natural history of mammoths writes, "Ever since the late Pleistocene (and in some places for at least a million years), the ground here [in Siberia and Alaska] has been frozen to a depth of up to 1500 ft. (500 m[eters]), and in the brief summer only the top 5 ft. (1.5 m) thaw out."<sup>441</sup> Hapgood has also concluded that what "the edible mammoth steaks proved [was] that meat had been so kept in at least a few cases for perhaps 10,000 to 15,000 years in the Siberian tundra."<sup>442</sup> It is universally agreed that this is indeed the case as stated in the *Britannica*:

"Work in Alaska demonstrates that all the carcasses are between 10,000 and 70,000 years old and could not have been older because they would not have survived the preceding interglacial warm period when the ground and its enclosed carcasses thawed. In order to preserve the carcasses in nature's deep freeze, it is evident that most of the permafrost present today in central Alaska [and elsewhere even] at least has existed since late glacial times."<sup>443</sup>

This is the very point I wish to challenge by showing that, during the Holocene hipisothermal, the permafrost in Siberia and Alaska also thawed and melted deeply. Under such a condition, the ivory, bones, and mammoth carcasses would have all been destroyed as during the previous interglacial warmth.

The point that must be emphasized is that if the climate of the arctic region was temperate, and temperate forests grew there, then the temperate climate would have warmed the air, and the air, in turn, would have warmed the ground, and the warm ground would have melted the permafrost and destroyed the ivory. As stated further in the *Britannica*,

"The thickness and areal distribution of permafrost is directly affected by snow and vegetation cover, topography, bodies of water, the interior heat of the earth, and the temperature of the atmosphere. . . .

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<sup>440</sup>H. Howorth, "The Climate of Siberia in the Mammoth Age," *Nature*, Vol. 39, (February 14, 1889), pp. 365-366.

<sup>441</sup>Lister, Bahn, *Mammoths*, *op. cit.*, p. 42.

<sup>442</sup>Hapgood, *The Path of the Pole*, *op. cit.*, p. 261.

<sup>443</sup>*Encyclopedia Britannica, Macropedia*, Vol. 14, (Chicago, 1982), p. 90.

"The most conspicuous change in thickness of permafrost is related to climate. At Barrow, Alaska [on the Arctic Ocean], the mean annual air temperature is -12°C and the thickness is 1,300 ft. (396.5 m). At Fairbanks, Alaska in the discontinuous zone of permafrost in central Alaska, the mean annual air temperature is -3°C and the thickness is about 300 ft. (91.5 m). Near the southern border of permafrost the mean annual air temperature is about 0° or -1°C and the perennially frozen ground is only a few feet thick."<sup>444</sup>

Thus, two aspects of the arctic come into play, the temperature of a "body of water," the Arctic Ocean, and the rise in temperature around arctic lands.

What would happen to the permafrost if the temperature in the arctic rose? According to Peter J. Williams and Michael W. Smith:

"Since permafrost is a thermal ('climatic') condition it is potentially sensitive to climatic change. . . . Climatologists have shown that air temperatures would increase because of the so-called 'greenhouse effect,' although it is not clear by how much. Studies demonstrate, however, almost universal agreement on a warming concentrated in the polar regions. . . ; for a doubling of atmospheric CO<sub>2</sub> content, some models predict that annual air temperatures throughout the Arctic would increase by 3° to 6°C, . . . [5.4° to 10.8°F]

"While such a trend has not yet been clearly identified in the meteorological record . . . , the magnitude of such changes in climate would produce serious and far-reaching environmental . . . problems in permafrost regions. . . .

"Permafrost is unique in earth material terms, since it exists close to its melting point. Most discontinuous permafrost is either relict, or in such delicate balance that climatic or other environmental changes can have drastic disequilibrium effects. Tens of thousands of square kilometers of permafrost are warmer than -3°C, and we can expect that most of it would eventually disappear under the climatic [greenhouse] warming predicted, although complete degradation would certainly take many centuries."<sup>445</sup>

The point that must be stressed is that the most pronounced heating effects will be experienced around the polar regions. In analyzing the rise of 3.6 degree Fahrenheit caused by a possible greenhouse effect, "Walter Orr Roberts, president emeritus of the University Corporation for Atmospheric Research . . . believes the poles could heat up by as much as 10 degrees Centigrade, or 18 degrees Fahrenheit."<sup>446</sup> Therefore, the

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<sup>444</sup>*Ibid.*, p. 91.

<sup>445</sup>Peter J. Williams, Michael W. Smith, *The Frozen Earth Fundamentals of Geomorphology*, (New York, 1989), pp. 79-80.

<sup>446</sup>Jonathan Weiner, *Planet Earth*, (New York, 1984), p. 136.

temperature of the land masses of the arctic would rise dramatically with a small rise in the Earth's temperature.

As was pointed out above, cold oceans adjacent to land masses tend to cool these lands significantly. On the other hand, warm oceans adjacent to land masses will tend to heat up these same lands significantly. For example, the Gulf Stream creates temperate climatic conditions for Europe from London, England which is 1,000 miles north of New York to Oslo and Stockholm in Scandinavia, which are about 600 miles north of London. The same must also apply to circumpolar lands adjacent to the Arctic Ocean during the hipsithermal when it is well recognized that there was no ice cover over it.

Brooks claims that during the hipsithermal, "the Arctic Ocean . . . [was] free of ice, . . ." <sup>447</sup>

But more critical to this analysis is the question of whether or not the temperature of the Arctic Ocean's waters were significantly warmer than they are today. To this Brooks further shows,

"The interesting question arises, has the temperature of the Arctic Ocean risen above the critical point [for it to melt away the ice cover] at any stage of post-glacial time? I think there is no doubt that it has. During the 'Climate Optimum' [the hipsithermal] there was a rich flora in Spitsbergen, while the fossil marine mollusca indicate a COASTAL SEA TEMPERATURE MUCH HIGHER THAN THE PRESENT IN ALL THE ARCTIC LANDS which are at present dominated by sea ice. . . ." <sup>448</sup>  
(Capitalization added)

Butzer explains that "plant fruits of now sterile perennials have been found on the Arctic islands." <sup>449</sup> These plant fruits require seasonal photoperiodic signals to begin flowering and a long enough summer to mature and produce fruit. But Butzer tells us on the same page many "species of Spitsbergen do not reproduce [sexually] under present climatic conditions." This clearly indicates a different orientation of the poles.

The oceans play a dominant role in terrestrial climate, as is well known. The point I have stressed with capital letters is that the sea temperature of the Arctic Ocean based on the fossil marine mollusca prove that during the hipsithermal the ocean temperature was *much higher than present in all the arctic lands*, not just certain particular lands but all. As will be pointed out below, the temperature of the Atlantic Ocean during the hipsithermal rose between 6 and 10 degrees Celsius or between 10.8 and 18 degrees Fahrenheit. It is thus clear that the temperature of the Arctic Ocean was

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<sup>447</sup>C. E. P. Brooks, *Climate Through the Ages*, 2 ed., *op. cit.*, p. 143.

<sup>448</sup>*Ibid.*, p. 142.

<sup>449</sup>Karl W. Butzer, *Environment and Archaeology*, (Chicago, 1964), p. 443.

much higher as well. Thus, any lands adjacent to it would be warmed by the air masses heated by water. According to Borisov, "Twice during the Holocene for a total of 5,000 years, the Arctic Basin was completely free of ice. And the ice sheet was unstable several times for a total of 4,000 years, that is, it melted in summer and froze up in winter, but over a smaller area than in our time."<sup>450</sup>

In fact, during the warming by 1° F during the period between 1890 and 1940 based on his polar experience on expeditions with Amundsen and Byrd, polar specialist Bernt Balchen suggested "that the Arctic Ocean may be ice-free by the year 2000, that ice over that ocean decreased in thickness from 43 feet in 1893 to a current thickness of 6 to 8 feet in both winter and summer over an area of 5 million square miles."<sup>451</sup> The Arctic Ocean, according to the 1982 *Britannica*, Vol. 1, page 1118 covers 5,600,000 square miles. Therefore, if a 1° F warming for 40 or so years caused the ice cover over nearly all of the Arctic Ocean to decrease in thickness from 43 feet to a thickness of 6 to 8 feet, what would four to five thousand years of warming to 2° to 3° C or 3.6 to 5.4° F do to the ice cover? I suggest it would melt back to a mere fraction of its former size.

According to Maurice Ewing, a warmer Arctic Ocean during this warm period would create "a warming effect on the land immediately adjacent to the Arctic from the influence of the relatively warm water."<sup>452</sup>

According to Orr:

"The contrasting nature of land and sea further modifies the climatic behavior of coastal areas. Because the sea presents a relatively smooth watery plain having a tremendous heat-holding capacity, it warms slowly and cools slowly. . . . Land, on the other hand, maybe mountainous, covered with dense vegetation, barren, flat, or rocky, and hence subject to rapid weather changes.

"Coastal-area climates are especially influenced by the sea where the prevailing winds blow inward over the land. Our own [American] west coast and western Europe have climates tending to be marine in nature. They are thus subject to lesser extremes of temperatures, . . . where ocean currents sweep past a shore, climates can be so altered as to mask almost completely the geographical location of the land. Warm currents pouring northward from tropic areas of the Atlantic and Pacific give the coasts of Norway and Alaska essentially temperate climates, even though both are at arctic latitudes."<sup>453</sup>

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<sup>450</sup>Borisov, *Can Man Change the Climate*, *op. cit.*, pp. 63-64.

<sup>451</sup>Schultz, *Ice Age Lost*, *op. cit.*, p. 222.

<sup>452</sup>Maurice Ewing, W. L. Donn, "Pleistocene Climate Change," *Geology of the Arctic*, Vol. II, G. O. Rasch ed., (Toronto, 1961), p. 933.

<sup>453</sup>Clyde Orr, Jr., *Between Earth and Space*, (New York, 1959), pp. 157-158.

In essence, all the circumpolar lands adjacent to the Arctic Ocean would be warmed inland for about a few hundred miles above the freezing point because the winds coming off the ocean would carry the ocean surface temperature with it. We are probably all familiar with sea and land breezes at the seashore which, during the day (when the land heats up more than the water), causes a land to ocean breeze, but at night (when the sea is warmer than the land) creates a sea to land breeze. The point is that in the circumpolar lands in winter the land will become cooler than the Arctic ocean and the winds will blow from the warmer sea to and over the land carrying above freezing masses of warm air all winter. The entire northeastern coast of the United States and Alaska for about a few hundred miles inland are heated during the winter by the Gulf Stream and Japanese Current so that it is always considerably warmer than the surrounding regions farther inland. And this occurs in the northeast with prevailing westerlies which blow off the land. The very same meteorological conditions must also apply to all circumpolar lands during the hipsithermal when the Arctic Ocean was considerably warmer.

This process will thus bring the land temperatures of these arctic regions above the freezing point much of the winter; and also importantly during the spring, summer, and fall seasons. On the basis of this evidence, none of the circumpolar lands adjacent to the Arctic Ocean for about a few hundred miles inland would have been able to sustain permafrost during the hipsithermal period. And I hasten to point out that nearly all of the frozen mammoth mummies are found just in this region.<sup>454</sup> And as Stonehouse pointed out above, tall trees grow in regions where the mean annual temperature is well above freezing. Thus tall trees growing near the Arctic Ocean corroborate that the mean annual temperature of the Arctic was well above freezing and the permafrost would have melted deeply.

Again, there is simply no escape from this fundamental meteorological phenomenon. The most northerly lands around the Arctic Ocean would not be able to maintain their permafrost during the hipsithermal.

Now permafrost will only form over lands with a mean annual temperature below freezing. But we have been told that Spitsbergen, which is several hundred miles north of Europe and Siberia, had a mean annual temperature above freezing during the hipsithermal. If a landmass several hundred miles north of Siberia and Alaska had a mean annual temperature above freezing, what had to be the mean annual temperature of the lands several hundred miles south on the edge of the Arctic Ocean? These circumpolar regions would have to have had a mean annual temperature well above that of Spitsbergen and the permafrost ground in these areas had to melt to great depth. Furthermore, Pielou has informed us that large trees do not grow on permafrost tundra, but will only grow when the land is free of it. Therefore, the question is: Were there forests of large trees growing in the lands adjacent to the Arctic Ocean during the hipsithermal? Yes, indeed, there were, as shown above, and will be presented below.

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<sup>454</sup>Lister, Bahn, *Mammoths*, *op. cit.*, pp. 154-156.

Let us examine the evidence that these lands had forests of large trees growing on them. But more importantly, in some cases, these large tree forests grew in the very regions where mammoth carcasses were unearthed. According to Pielou:

"The earliest signs of warmth possibly dating from a little before 10K B.P. [10,000 years ago] come from the Seward Peninsula Alaska, [on the Arctic Ocean] . . . Fossils of beaver dams and beaver-gnawed wood have been found, as well as logs of poplar, birch and spruce. The peninsula is beyond the modern range of beavers, birch and spruce, and only a few small poplars remain where big ones once flourished. *The large size of the fossil logs shows that the trees grew in deep soil; permafrost was probably much less widespread than it is at present.*

"Indeed, the soil as well as the atmosphere warmed up during the hypsithermal. *Probably much of the subarctic where permafrost occurs was free of it.*"<sup>455</sup> (Emphasis added)

Colinvaux adds that "Beaver chewed wood had been found on the Seward Peninsula and the Baldwin Peninsula well to the west of the present position of the present tree line."<sup>456</sup> However, it must be added that beavers have a specialized diet as Bourlière explains: "The Canadian beaver is . . . specialized. Its provisions for winter consist entirely of branches and trunks of poplar, aspen, cottonwood, and willow, from which it gnaws the bark during the cold season. Bark of coniferous trees is not eaten."<sup>457</sup> That requires that the tall trees that grew in Alaska were tall poplar, aspen, cottonwood, and willow or deciduous type trees.

The point that Pielou specifically makes is that large deciduous trees were growing abundantly on the Seward Peninsula because beavers require woodland regions to live. She claims that these forests prove that the permafrost had melted deeply and that this subarctic area was free of it. However, Pielou has failed to grasp the significance of this evidence and what it indicates. The fact overlooked by Pielou and all researchers on this matter is that *a mammoth carcass was unearthed just on this peninsula.*

On the Seward Peninsula, at a site called Elephant Point at Eschscholtz Bay, L. S. Quakenbusch, in 1907, reported this first finding of a mammoth carcass in Alaska.<sup>458</sup> On the basis of this evidence, this mammoth could never have survived the thousands of years that followed of high temperate climate that made this forest, harvested by beavers,

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<sup>455</sup>Pielou, *After the Ice Age, op. cit.*, pp. 272-273.

<sup>456</sup>Paul Colinvaux, "Quaternary Vegetation History of Arctic Alaska," *The Bering Land Bridge*, David Hopkins ed., (Stanford, Calif., 1967), p. 227.

<sup>457</sup>Bourlière, *The Natural History of Mammals, op. cit.*, p. 45.

<sup>458</sup>Lister, Bahn, *Mammoths, op. cit.*, p. 158.

possible. That is, we have evidence of temperate conditions in the very region where a mammoth carcass was found. What this indicates quite directly is that this mammoth had to be buried and quick frozen after the hypsithermal ended on the Seward Peninsula. As reported by Farrand, Quakenbusch found large trees associated with mammoth remains in Alaska.

But even farther north in central Canada facing the Beaufort Sea, a branch of the Arctic Ocean, Pielou reports:

"During the warm period . . . much of what is now tundra [in Canada] was forested. An example is the Tuktoyaktuk Peninsula: at about 10K B.P. it was invaded by spruce, and the large quantities of pollen in lake sediment cores show that the vegetation must have been true forest of spruce, not merely scattered trees. Cattails and sweet gale evidently grew in wetlands in the forest; both were beyond their modern northern limit, which for cattails is several hundred kilometers to the south."<sup>459</sup>

In H. H. Lamb's book, *Climatic History and the Future*, is a photograph of a tall stump of a spruce tree about a foot or more in diameter—and about four feet high, located on this peninsula. Lamb states,

"The stump, radiocarbon dated about 4940 years ( $\pm 140$ ) B.P., is seen still standing on a steep bank on the Tuktoyaktuk Peninsula . . . which borders the Arctic Ocean. . . . This tree in what is now tundra shows wider growth rings than the nearest present-day spruce forest 80-100 km [50 to 62 miles] farther south."<sup>460</sup>

The tree with wider growth rings than those found farther south requires that it was much warmer when it grew and that the climate there was temperate. It also requires that the growing season was much longer to allow the thick rings to grow. But this tree well north of the Arctic Circle would never, under present conditions, ever be able to have such thick tree rings. The growing season is only three to five weeks, while a ten to twelve week season is required for such growth. The cattails are definitive proof of the temperate climate regime.

One cannot get much farther north on continental Canada than the Tuktoyaktuk Peninsula, but during the hypsithermal, fully temperate large tree forests were growing there, as were fully temperate cattails, and sweet gale. What uniformitarian scientists want to believe is that, on the opposite shores of the Siberian arctic, during this same

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<sup>459</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 273.

<sup>460</sup>H. H. Lamb, *Climatic History and the Future*, (Princeton, 1977), plate IV.

period, these very same kinds of temperate tall tree forests did not grow, even though they grew on the shores of the Arctic Ocean in Canada well above the Arctic Circle.

There are no other mammoth carcasses in North America except that uncovered in Fairbanks south of the Seward Peninsula. Let us, nevertheless, examine the mammoth found at Fairbanks Creek, Alaska where the face, trunk and foreleg of a mammoth calf were unearthed in 1948.<sup>461</sup> This is the region in Alaska that Pielou claimed was also inhabited by fully temperate ferrets and American badgers. Badgers are burrowing animals that live underground. But they could not have lived underground in a region covered by permafrost because in the summer season the permafrost would melt and fill their burrows with cold water. They could not live below ground where their natural state suggests they must. That is, they presently live in burrows in very temperate regions of the United States down to Mexico where there is no deep permafrost. The same ground conditions had to exist in Alaska when they lived there for thousands of years. That is, in central Alaska, the permafrost had to have melted at least 30 feet or more in order to allow the ground above it to stay warm enough for badgers to live in their burrows in the winter. American badgers only live in dry regions and not in permafrost regions because they burrow through the soil to find much of their sustenance. They could not do that in permafrost. Ernest G. Neal, in his book *Badgers*, makes this point quite directly. "The ideal sett [badger home-tunnel-maze] appears to be one which is easy to dig, *is dry and, therefore, relatively warm.*"<sup>462</sup> (Emphasis added) In the regions of North America that badgers presently inhabit, the ground does freeze but only at the surface downward for a few feet. Therefore, in winter, the badger's sett is beneath this frost layer and is dry and warm. This could not and would not occur in central Alaska during the Ice Age. If there was a permafrost that existed several feet below the surface in winter, the cold air above and the cold permafrost below the badger's sett would conspire to either freeze or make the ground between these cold zones extremely cold and badgers could not maintain their needed warmth to live nor find sufficient grubs, worms, etc., to nourish themselves. French naturalist, Pierre Pfeffer explains: "None of the tundra's sedentary mammals hibernates, evidently because of the impossibility of digging deep enough tunnels and because the brief summer does not allow enough time for reproduction and the accumulation of reserves of fat for winter"<sup>463</sup> [AND] "The perpetually frozen ground or permafrost is almost everywhere [on tundra] a few score and sometimes several hundred yards deep. This prevents animals from burrowing and hence keeps out such invertebrates as earthworms as well as moles and shrews [and badgers] that feed on [a lot of] these."<sup>464</sup>

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<sup>461</sup>Lister, Bahn, *Mammoths*, *op. cit.*, p. 158.

<sup>462</sup>Ernest G. Neal, *Badgers*, (Pode, Dorset, Eng., 1977), p. 86.

<sup>463</sup>Pierre Pfeffer, *Asia A Natural History*, (New York, 1968), p. 26.

<sup>464</sup>*Ibid.*, p. 24.

Furthermore, badgers are not true hibernators. "Scientists do not regard the badger's winter sleep as true hibernation. During the winter, the body temperature, breathing rate, and heart rate of badgers do not drop as much as they do in true hibernators."<sup>465</sup> But above the Arctic Circle where badgers lived, it would have to hibernate for an extensive period of time during the long, dark winter season. It could not survive for such an extended period with its higher metabolism using up its body reserves of fat for nourishment during these long cycles.

Therefore, the climate of central Alaska, which is generally much colder than at its coast, say on the Seward Peninsula, had to be temperate enough for badgers to live and be without surface or near surface permafrost for thousands of years both summer and winter.

Hence, the mammoth remains had to be buried there at a time when there were no badgers living in Alaska or during and up to the end of the hypsithermal. Lemmings living in the arctic live in burrows in the snow, and in summer in the unfrozen ground, while badgers do no such thing. Furthermore, badgers burrow through the ground to hunt their prey. Permafrost is as hard as rock and it would be impossible for badgers to hunt in winter if the permafrost was near or at the surface, nor could their food live in frozen ground. That means central Alaska had no such forms of permafrost in winter for thousands of years. But let us now examine the forests and other forms of vegetation that grew across the rest of North America adjacent to or very near to the Arctic Ocean to show large tree forests covered this entire region.

But this should not have been a surprise since F. P. von Wrangell in 1844 cited Hedenstrom who, while traveling in eastern Siberia from the Indigirka River region to Ulsiank reported

"On the tundra equally remote from the present line of forest, among the steep sandy banks of the rivers and lakes, are found large birch trees, complete with bark, branches and roots. At first glance, they appear to have been well preserved by the earth, but on digging them up they are found to be in a thorough state of decay. . . . The first living birch tree is not found nearer than three degrees [210 miles] to the south, and then only in the form of a shrub."<sup>466</sup>

A. F. Brandt in 1867 cited Herr Von Ruprecht who had found standing trunks of birch trees about five feet in height, or tall as a person on the Chernoi Nos Peninsula, at

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<sup>465</sup>Gary A. Heidt, "Badger," *The World Book Encycl.*, Vol. 2, (Chicago, 1995), p. 24.

<sup>466</sup>F. P. von Wrangell, *Narrative of an Expedition to Siberia and the Polar Seas 1820-23*, 2nd ed. (transl. E. Sabine), (London 1844), p. cxxxiv.

the point of the Indiga River where it joins the Arctic Ocean, where today are found only shrub birch close to the ground.<sup>467</sup>

In 1881 N.A.E. Nordenskjold pointed out that in the Yenisei Valley were trees under the tundra of similar type that only grow much farther to the south with their roots planted firmly in the frozen soil.<sup>468</sup> It is not, therefore, unusual that large birch trees grew across Siberia right to the shores of the Arctic Ocean.

Howorth points out that on the American shores of the Arctic Ocean, "acorns were found."<sup>469</sup> He goes on to cite Richardson's book, *The Polar Region* to also show, ". . . acorns are remarkable things to be found in such a deposit, as no oaks grow on the banks of any American river that falls into the Arctic Sea, nor approach within many miles of the dividing watershed."<sup>470</sup> Pfeffer shows that "the oaks characteristic of European or Far Eastern forests are totally absent from true taiga."<sup>471</sup> Thus, it can be seen that oaks grew where presently there is taiga and even tundra.

Even farther west, Pielou points out,

"Investigations in tundra near Dubawt Lake (west of Hudson Bay) have revealed buried soil covered by a layer of charcoal fragments—the remains of a forest fire. The charcoal, and hence the fire, date from 3.5 K B.P.; if there was a forest fire, there must have been a forest, at a site now 280 kilometers [170 miles] north of the tree line. In Labrador, the evidence that big trees once grew where now the land bears a parkland of much smaller trees or tundra consists of massive subsoil spruce logs eroding out of peat beds."<sup>472</sup>

What Pielou has shown is that temperate forests grew from the Seward Peninsula across the top of Canada adjacent to the Arctic Ocean right into Labrador. These forests and cattails all point to the fact that the climate across North America facing the warm Arctic Ocean was temperate and that the permafrost melted greatly.

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<sup>467</sup>A. F. Brandt, "Kurze Bemerkungen über Aufrechtstehende Mammal-Leichen," *Bull. Soc. Nat. Moscow*, Vol. xl, no iii, (1867), pp. 241-256.

<sup>468</sup>N. A. E. Nordenskjold, *Voyage of the Vega Around Asia and Europe*, Vol. 1, (London, 1881), pp. 330-331.

<sup>469</sup>Howorth, *The Mammoth and the Flood*, *op. cit.*, p. 264.

<sup>470</sup>*Ibid.*

<sup>471</sup>Pfeffer, *Asia*, *op. cit.* p. 34.

<sup>472</sup>Pielou, *After the Ice Age*, *op. cit.*, pp. 273-275.

One further point to stress is that the forest that burned in Northern Canada dates to 3,500 years ago. In essence, we have proof that temperate forests thrived in the circumpolar lands of North America to about the time of the end of the hypsithermal 3,500 years ago in complete conformity with Velikovsky's thesis. But what, then, of Greenland? Is there evidence there for temperate conditions? According to Charlesworth, there were "peats and relics in Greenland."<sup>473</sup> Louise A. Boyd describes that a lush vegetation was being exuded from a dike ridge of a glacier in NORTHEASTERN, Greenland containing "two whole leaves, . . . [also] partly decayed leaf of a shrub . . . small fragments of plant tissues."<sup>474</sup> But most significantly, D. S. Allen and J. B. Delair report that some 200 miles north of the Arctic Circle, "near Disko Bay . . . last century an ancient tree, with a trunk 'thicker than a man's body,' was found still standing erect on a hill at an elevation of 1,080 feet (332 m) by Capt. Inglefield."<sup>475</sup> Of course such a tree requires a temperate climate. However, standing 1,080 feet above sea level requires that whatever ice existed on Greenland or permafrost that must have existed deteriorated drastically.

East of Greenland is Iceland, of which Dyson has told us that "birch trees far larger than anything growing in Iceland today" were found.

Moving eastward, we come to the islands of Spitsbergen, north of Siberia and above we were informed it had a temperate climate. "During the 'Climate Optimum' there was a rich flora in Spitsbergen. . . ."<sup>476</sup> According to Borisov there was "no ice on Spitsbergen."<sup>477</sup> Borisov goes on to state,

"Forests extended right up to the Barents Coast and [temperate trees such as] oak, linden and filbert reached the shores of the White Sea. The information available warrants the assumption that on the European continent, the tundra and forest-tundra zones disappeared completely. In the northern part of Asia plant fossils were found only 80 km [49 miles] from Cape Chelyuskin and peat-moss was discovered on Noyava Zemlya."<sup>478</sup>

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<sup>473</sup>J. B. Charlesworth, *The Quaternary Era*, Vol. II, (London, 1957), p. 1484-1487.

<sup>474</sup>Louise A. Boyd, *The Coast of Northeast Greenland*, Am. Geol. Soc. Sp. Pub. No. 30, (New York, 1948), p. 132.

<sup>475</sup>D. S. Delair, J. B. Allen, *When the Earth Nearly Died*, (Bath, Eng., 1995) p. 248; See also, G. H. Denton, *The Last Great Ice Sheet*, (New York, 1981).

<sup>476</sup>Brooks, *Climate Through the Ages*, *op. cit.*, p. 142.

<sup>477</sup>Borisov, *Can Man Change the Climate*, *op. cit.*, pp. 36-37.

<sup>478</sup>*Ibid.*, pp. 36-37.

Cape Chelyuskin is the most northern point on the Arctic Ocean of continental Asia, 600 miles east of Noyava Zemlya and over 1,000 miles east of Spitsbergen. Therefore, these regions from Europe to north central Asia had a temperate climate. Finally, on Wrangel Island in the Arctic Ocean, at the far eastern end of Siberia, we are informed that mammoths lived there right up to about 3,500 years ago.<sup>479</sup> I will elaborate on this item below, but in order for mammoths to live, even uniformitarians understand that they require at least a temperate rich grassland and trees throughout the year, or a temperate climate.

N. V. Kind writes of the lower Malaya Kheta River in Siberia that it was clearly well forested.

"A section through lower Holocene deposits formed during the post-glacial climatic optimum is . . . provided by exposure through peat bogs on the surface of the 'Karginy terrace,' along the lower reaches of the Malaya Kheta River [adjacent to the Arctic Ocean]. Spore-pollen spectra from these deposits are characterized by an abundance of spruce . . . in the lower part of the section and by an increasing prominence of tree birches in the upper part. Among the macroscopic plant remains, cones and seeds of fir . . . and bark of *Betula* [birch] . . . *Albae* [white birch] are abundant. The plant remains indicate the development of forests that is now tundra with a climate warmer than at present."<sup>480</sup>

Therefore, rich floras, peats, and rich grasslands also existed all across the circumpolar lands from Europe to eastern Siberia in the most northerly regions. What had to have been the climatic conditions farther south in the interior regions? The unequivocal answer is that hundreds of miles south of the temperate Spitsbergen, Noyava Zemlya Islands, the temperate Chelyuskin Peninsula, and temperate Wrangel Island, the climate had to be even warmer, and had to melt the permafrost to great depth. The south, of course, was subject to greater solar heat.

Pielou has told us, on the basis of forests found growing across northern Canada and Alaska, "in higher latitudes the top of the permafrost was of a greater depth below the surface."<sup>481</sup> The question is, did forests grow in the northeastern arctic regions of Siberia where uniformitarians claim the surface permafrost never melted? In 1941, B. A. Tikhomirov published the results of his research on this question in Russian titled "O lesnoy faze v poslednikovoy istorii rastitelnosti severa Sibiri i yeye relikatakh v sovremennoy tundre" or "the forest phase in the postglacial history of the vegetation of northern Siberia and its relics in the tundra of today" in *Materially po istorii flory i*

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<sup>479</sup>B. Bower, "Dwarf mammoths outlive Ice Age," *Science News*, (March 27, 1993), p. 197.

<sup>480</sup>N. V. Kind, "Radio carbon Chronology in Siberia," *The Bering Land Bridge*, David Hopkins ed. (Stanford, Calif., 1967), pp. 177-178.

<sup>481</sup>Pielou, *After, op. cit.*, p. 273.

*rastitelnosti SSSR*, or *Data on the history of the flora and vegetation of the USSR*, Vol. 1, (Moscow-Leningrad). His findings have been systematically ignored, reinterpreted or are claimed to be erroneous because he claimed the existence of forests in the northeastern regions of Siberia.

For example, in the Lena delta adjacent to the Arctic Ocean, he found some willow tree trunks 10-12 cm or 4 to 5 inches in diameter and larch wood, which A. P. Yaskovskiy admits, "these species now grow much farther south and are not found here at all"<sup>482</sup> Tikhomirov found wood and the seeds of *larix dahurica* (larch) and the wood of white spruce and more willow in peat bogs near Tiksi Bay. The unusual aspect of the white birch was that it was not in any way dwarfed. Chester S. Chard describes the kind of birch found in northeastern Siberia thus:

"The Postglacial climate optimum is an appropriate term to use in Siberia for the period 8,000-4,500 B.P. The climate was warmer than today, and the vegetative zones spread north of their present limit. On the lower Lena, for instance, spruce and pine pollen occurs *several hundred kilometers* north of its present range and *trunks of birch trees of normal size . . .* have been found in peat deposits."<sup>483</sup> (Emphasis added)

Speaking of eastern Siberia, probably the coldest area on the Asian continent R. E. Giterman and L. V. Golubeva describe the forest that grew there during the post-glacial time:

"Four phases [from deposits] are distinguished during the Holocene. The first is transitional between the vegetation of the late Sartan cold period [at the end of the Ice Age] and that of the [onset of the] climatic optimum [hipsithermal]; forests of larch, birch and pine were widely distributed, and pine-spruce forests grew in the valleys. The second and third phases represent the climatic optimum during which the climate was warmer than that of the present day. During the climatic optimum the boundary of the forest zone extended well north of the present forest boundaries and fingers of forest penetrated far into the unforested tundra . . . Pollen evidence indicates that the broad-leafed species *Quercus mongolica* [oak trees] *Ulmus pumila L* [elm trees] migrated into Pribaikalia and western Transbaikalia from the east and southeast at that time.

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<sup>482</sup>A. P. Vaskovskiy, "A Brief Outline of the Vegetation, Climate and Chronology of the Quaternary Period in the Upper Reaches of the Kolyma and Indigirka Rivers, and on the Northern Coast of the Sea of Okhotsk," *The Archaeology and Geomorphology of Northeastern Asia*, Henry N. Michael, ed., (Toronto, 1964), p. 492.

<sup>483</sup>Chester S. Chard, *Northeast Asia in Prehistory*, (Madison, Wis., 1974), p. 57.

Oak is now completely absent from this region and elm occurs only in isolated forests in the valleys of western Transbaikalia."<sup>484</sup>

Not only large willow trunks, but also fully grown, normal-sized white birch trunks are found in the Lena delta in peat bogs, which means these trees could not have been floated there because peat bogs have no large stream inlets or outlets. This is the same type of evidence found on the Tuktoyaktuk Peninsula of Canada, which shows that, as in Canada, forests of temperate birches, willows, and spruce grew in the extreme north of Siberia. H. H. Lamb, *et al.*, analyzed the evidence related to the northern limit of trees at the Proceeding of the International Symposium on World Climate held at Imperial College, London, in April 1966. On pages 194-195, they outline the extent of this northward migration of trees. The striking figures 8(b) for around 4,000 B.C. and 8(c) for around 2,000 B.C. show that the northern limit of trees was along the shores of the Arctic Ocean for most of Canada and most of Siberia.<sup>485</sup>

Now, in the Lena delta, where the tall tree was found, is also the place where M. Adams recovered the frozen carcass of a mammoth and brought it back to St. Petersburg in 1806. Various forms of evidence that were also related to frozen mammoths drove H. H. Lamb, one of the world's greatest climatologists of this period—the hipsithermal—to state the following:

"A vivid personal account of the commander, Beckendorf, of a small Russian steamship engaged in survey work in 1846 near the mouths of the Lena and Indigirka rivers in northeast Siberia (given in English by H. H. Hutchinson in *Extinct Monster*, [London . . . 1893], pp. 205-9), recorded the appearance of the landscape in an *exceptionally warm summer* and of a mammoth, released from the grip of the permafrost, being swept down the river: 'We steamed . . . up the Indigirka; but there were no thoughts of land; we saw around us only a sea of dirty brown water, and knew the river only by the rising and roaring of the stream. The river rolled against us trees, moss and large masses of peat. . . .' After eight days sailing up the river, the vessel was stopped, but the landscape remained unrecognizable because of the floods and the current continued to tear up the soft ground. At this point a mammoth, with its elephant's head reared at times out of the water, was washed against the ship and secured by ropes long enough for some examination of it to be made before the soft ground sank under the water and the animal disappeared. In the same work (p. 201), the gradual emergence from the ice of another mammoth, still frozen, on the shore of a lake near the Lena River, between 1799 and 1803, observed by a Tungus fisherman is described. . . . These conditions surely suggest that the mammoths found intact

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<sup>484</sup>R. E. Giterman, L. V. Golubeva, "Vegetation of Eastern Siberia during the Anthropogene Period," *The Bering Land Bridge*, David Hopkins, ed., (Stanford, Calif., 1967), p. 242.

<sup>485</sup>H. H. Lamb, R. P. W. Lewis, A. Woodroffe, "Atmospheric circulation and the main climatic variables between 8,000 and 0 B.C.: meteorological evidence," *World Climate From 8,000 to 0 B.C.*, (1967 London) p. 194-195.

in the permafrost must have been preserved ever since their deaths, by the readvance of the permafrost in the last few millennia since the postglacial warmest climates."<sup>486</sup>

Lamb claims the mammoths were "preserved," meaning *frozen*, "since," meaning *after*, the "postglacial warmest climates" meaning *the hipsithermal*, or that these mammoths of Siberia were frozen not 10,000 years ago, but 3,000 or 4,000 years ago, after the hipsithermal ended.

Why was Lamb forced to say that all the mammoths of Siberia were killed and frozen at the end of the postglacial warm period? The answer is quite apparent. During that *exceptionally warm summer*, in northeast Siberia—the coldest region of Asia—the ground thawed so greatly that mammoths, trees, moss, and large masses of peat were being eroded out of the permafrost rapidly. But, Lamb then understood that during the time of the great postglacial warmth, the summers had to be exceptionally warmer than that which was described. Also, there had to be thousands of such extraordinarily hot summers, not just the very rare ones that occur today. He understood that if the coldest region of Siberia would thaw so greatly in the present climatic period, in a greatly warmer one, the thawing had to surpass this one and make it puny by comparison. Given all this, Lamb understood that none of the mammoths found in the ground of Siberia today could have survived thousands of such summers. They would have all rotted away. Furthermore, he was describing the most northeastern areas of Siberia. Therefore, all the buried mammoths found south of this region had to have experienced even hotter summers than their more arctic relatives. Yet, a few mammoths are found in the southern parts of Siberia. Therefore, Lamb claimed these mammoths did not die off during the Ice Age but, at the end of the hipsithermal, which was the only reasonable, plausible, and rational way to deal with the data, which is in full congruence with Velikovsky's theory.

Lamb has also maintained elsewhere that the mammoths did live into postglacial times directly:

"It seems to the writer [Lamb] that the likeliest explanation of the sudden death of those mammoths that have been found well preserved in permanently frozen ground to modern times is that they were among the last survivors of their species, which strayed or fled from human hunters into swampy, near-frozen wasters in the tundra in some of the last of the warmest summers of post-glacial times four or five thousand years ago. Since then the permafrost, or permanently frozen subsoil, has advanced again and the animals have been preserved. . . ."<sup>487</sup>

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<sup>486</sup>H. H. Lamb, *Climate History and the Future* (Princeton, N. J., 1984), pp. 158-159.

<sup>487</sup>H. H. Lamb, *Climate History and the Modern World*. (London, 1982), p. 113.

Thus, it is rather clear that one of the world's leading climatologists concluded from the evidence that the mammoths did live well into post-glacial times just as Velikovskiy suggests.

Because these finding of forest trees were so contradictory to what was expected, it was argued by Vaskovskiy that "It seems to me that the identification of spruce wood in the Tiksi peat bogs was erroneous or that its stratigraphic position was determined incorrectly."<sup>488</sup> In order to explain the undeniable presence of large white birches and willows, as well as larches which also grow today far to the south, Vaskovskiy further suggests they only "pushed northward from their present limit during one of the moments in postglacial history."<sup>489</sup> But this means northern Siberia had for a long enough period of time a temperate climate for these trees to grow, and the permafrost had to melt to allow this.

In various books and papers B. Frenzel's maps of the areas of permafrost do appear which demarcate its limits during the various glacials, interglacials and even during the hipsithermal.<sup>490</sup> However, Flint earlier admitted "whether during those same [warm-interglacial or the hipsithermal] ages the continuous permafrost disappeared is not known."<sup>491</sup>

But more importantly, Martin Beniston, writing in *Frozen Ground*, The News Bulletin of the International Permafrost Association admits that frankly: "Little is currently known about the rapid degradation and loss of permafrost in the subpolar regions that is frequently cited as an artifact of climate warming."<sup>492</sup> The entire analysis is based on modeling or theoretical constructions which have never been proven valid.

Lamb remarked that Frenzel's maps were based on "relics," that is, materials left in the ground of Siberia. Yet, in spite of this, Lamb said the mammoths were frozen after the permafrost re-advanced after the hipsithermal. Why did he reject Frenzel's evidence to make this claim? It is, I claim, because Frenzel's relics were ivory tusks and such which were recovered in good condition all over Siberia. That is, the argument is a circularly reasoned statement. Since all these relics are believed to have been frozen about 10,000 years ago, wherever they are found circularly proves that permafrost existed since 10,000 years ago. Typical of this line of reasoning is Frenzel's map related to the Taimyr mammoth carcass discovered in 1948 with some soft tissue, skin, and hair.<sup>493</sup>

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<sup>488</sup>Vaskovskiy, *op. cit.*

<sup>489</sup>*Ibid.*

<sup>490</sup>Burkhard Frenzel, *Climate Fluctuations of the Ice Age*, A. E. M. Nairn, transl., (Cleveland, 1973), pp. 36-37.

<sup>491</sup>Richard Foster Flint, *Glacial and Pleistocene Geology*, (New York, 1957), p. 204.

<sup>492</sup>Martin Beniston, "IPCC: An Update," *Frozen Ground*, No. 15, (June, 1994), p. 17.

<sup>493</sup>Lister, Bahn, *Mammoths*, *op. cit.*, p. 46.

But on Frenzel's map, the area around the Taimyr mammoth was without permafrost and the mammoth is found in the center of this area in an elongated bull's-eye of permafrost. In essence, Frenzel believed that all around this mammoth the permafrost had melted; but to maintain it in frozen ground the center of the region without permafrost conveniently did not melt.

The most bewildering aspect of Frenzel's 1973 map regarding the Taimyr mammoth is that Bernard Heuvelmann reported in 1959 (as cited at the start of this chapter) that the Taimyr mammoth was found beside large branches (not small ones) of willow and dwarf birch. Pavlovsky showed that ". . . willows are not now found less than 500 miles to the south, which suggests that the flora had migrated a minimum of 7° of latitude." By ignoring this fundamental contradiction to his mapping of the permafrost, Frenzel's conclusion that the Taimyr mammoth lay frozen in the ground for more than 10,000 years is not supported by these basic facts.

With such a form of mapping, it is not difficult to understand just what was happening when this map was created. But no matter what arguments are raised on behalf of Frenzel's map, H. H. Lamb's comment that the mammoths were frozen after the hypsithermal ended undermines the entire uniformitarian structure that is being proposed.

The hypsithermal categorically contradicts the view that mammoth ivory has lain in frozen ground in the arctic in good condition since the end of the Ice Age, 10,000 to 12,000 years ago. The hypsithermal was a period of thousands of years of temperate climate, (fully supported by large tree forests) that existed across northern Alaska, Canada, Europe, and Asia and melted away the permafrost to great depth.

During the years 1,000 to about 1,400 A.D., the climate warmed by only about 1°C or 1.8°F and Greenland was settled by the Norse. The conditions for life for farmers was apparently good. According to Brooks:

"Icelanders settled in Greenland in the tenth century A.D., and two colonies were established . . . The settlers brought with them cattle and sheep, which were successfully reared at first [just because it was warm enough to grow grass and hay for them as it would have been for Ice Age ungulates] . . . [I]n the fifteenth century . . . the colonies were lost sight of. For many centuries [the] fate [of the settlers] was unknown, but the history of the Eastern Settlement has now been made out by . . . excavations of a Danish archaeological expedition. . . . The most important evidence is derived from the excavation of the churchyard, in soil which is now frozen solid throughout the year, but which, when the bodies were buried, must have thawed for a time in summer, because the coffins, shrouds, and even the bodies were penetrated by the roots of plants [that could put down deep roots]. At first the ground thawed to a considerable depth for the early coffins were buried comparatively deeply . . . later burials lie nearer and nearer to the surface."<sup>494</sup>

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<sup>494</sup>Brooks, *Climate Through the Ages*, *op. cit.*, p. 356.

If a short period of about three or four hundred years of 1°C would create this condition on Greenland, what would four to five thousand years of 2° to 3°C do to the permafrost over the frozen areas of Europe, Asia and North America? According to Flint,

"The growing opinion among Russian geologists is that the ground now frozen [in Siberia] has reached that condition since the Fourth Glacial Age in direct response to the existing climate."<sup>495</sup>

What Flint is suggesting is that the Russian scientists who have been studying the permafrost for almost a century have concluded that it formed at the surface after the last Ice Age ended. And this, in fact, is what Russian scientists claim to be the case. As Borisov directly states of the hypsithermal:

"The permafrost, which covers the Arctic Basin greatly deteriorated during the period of warming. Thus, in north and northwest Siberia, the melting reached a depth of 200-300 m[eters]."<sup>496</sup>

Here Borisov makes it quite clear that the permafrost that covered the *entire Arctic Basin* or circumpolar lands had "deteriorated," meaning *melted* greatly. And according to Pielou, "In most places the hypsithermal lasted for three to four millennia."<sup>497</sup>

Jerry Brown, Secretary General of the International Permafrost Association states:

"For a temperature rise of 2°C [3.6°F] continuous permafrost will disappear in the Russian European north. All the way to the lower Ob to the Lower Hatanga and the Anadyr lowlands, only sporadic and discontinuous permafrost will remain. Continuous permafrost will exist only in the lowland of the Lena, Kolyma and Indigirka basins."<sup>498</sup>

But what of the 4 to 5 degree Fahrenheit rise for the hypsithermal? That is at a third more than the 2 degrees Celsius level even these basins should have lost their permafrost to great depth. The Hatanga or Khatanga River is located at between 100 to

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<sup>495</sup>R. F. Flint, *Glacial Geology and the Pleistocene Epoch*, as cited in A. O. Kelly and F. Dacheille, *Target Earth*, (Carlsbad, Calif., 1953), p. 231.

<sup>496</sup>P. Borisov, *Can Man Change the Climate*, transl. V. Levinson, (Moscow, 1973), p. 36.

<sup>497</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 270.

<sup>498</sup>Jerry Brown, "Permafrost and Climate Change: The IPA Report to the IPCC," *Frozen Ground*, No. 15, (June, 1994), p. 18.

110 degrees east longitude. If the permanent permafrost melted this far east, all the following frozen mammoths west of this longitude would thaw: they are Masha, the mammoth found on the Yamal Peninsula, the Yurbei mammoth, the Taimyr mammoth, and the Khatanga mammoth. Taken together with the Lena River delta mammoths, these make at least five recovered mammoths that froze up after the hipsithermal. And actually, we were informed above that climatologists suggest even higher temperatures would moderate the Siberian climate during a warming period.

According to R. L. Newson, if the arctic icecap melted and the Arctic Ocean's temperature was kept at the freezing point of ocean water, the winter air temperature over Canada and Siberia would rise 10°C to 30°C, and over the Arctic Ocean, it would rise 20°C to 40°C.<sup>499</sup> Analyzing the evidence with a different model M. Warshaw and R. R. Rapp, show that the temperatures over the Arctic basin would be similar to those of Newson.<sup>500</sup>

With temperatures in this range over Canada and Siberia, the permanent permafrost would disappear to great depth, but so, too, would the discontinuous permafrost.

Jonathan Weiner in discussing a warming similar to that of the hipsithermal cites the work of Syukuro Manabe of the Geophysical Fluid Dynamic Laboratory in Princeton.<sup>501</sup> Some of these claims contradict what occurred during the hipsithermal and are thus omitted.

" . . . the warming at high latitudes will be two or three times larger than the warming at low latitudes (because of a kind of feedback that was foreseen by Arrhenius. Sea ice will retreat. The pole [or regions] will be darker. Dark terrain soaks up more warmth from the Sun). . . . Above the latitude of Stockholm, Sweden and Anchorage, Alaska in the Northern Hemisphere, the warming could be as much as 10°C (18°F).

" . . . over the Arctic Ocean, the temperature increase will be at a maximum in winter and a minimum in summer. In other words, winters will be much warmer, while summers will be somewhat warmer. . . .

"The white caps of sea ice at both poles will grow smaller and thinner . . . ."<sup>502</sup>

What meteorologists and paleoecologists have done to preserve the mammoths in the far north is to employ the most conservative temperature regime possible. However,

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<sup>499</sup>R. L. Newson, "Response of a General Circulation Model of the Atmosphere to Removal of the Arctic Icecap," *Nature*, (1973), pp. 39-40.

<sup>500</sup>M. Warshaw, R. R. Rapp, "An Experiment on the Sensitivity of a Global Circulation Model," *Journal of Applied Meteorology*, Vol. 12, (1973), pp. 43-49.

<sup>501</sup>Syukuro Manabe, "Carbon Dioxide and Climate Change," *Advances in Geophysics*, (San Diego, 1983), pp. 39-82.

<sup>502</sup>Jonathan Weiner, *The Next One Hundred Years*, (New York 1990), pp. 103-104.

the warm type mollusks found at various points in the arctic prove that the Arctic Ocean was well above the freezing point, and thus even the model Newson applied is still too conservative, since he evaluated the air temperature on the supposition that the waters of the Arctic Ocean were at or near the freezing level. Since the temperature was greater, both the land temperature over Siberia and Canada and over the ocean had to be significantly greater than those he estimated. For thousands of years, the arctic basin was warm and in Siberia in the north and northwest, the permafrost melted to a depth of between 620 to 960 feet. That is, in the coldest regions of Eurasia (Spitsbergen), the surface permafrost melted to great depth. Even if we accept an extremely conservative melt of about 30 percent of this measure for the rest of the arctic basin, we still melt away about over 200 to over 300 feet of the permafrost. The water in the ground, over the thousands of years would have drained away into rivers and streams, and the soil of the north would have been unfrozen and so, too, would the thousands and thousands of mammoth tusks as well as mammoth carcasses. It would, of course, permit the growth of tall trees to put their roots down deeply many feet into the soil. It would have provided wood for beavers and soft soil for badgers to burrow into and hunt for sustenance such as temperate insects and grubs.

The point to stress is that mammoths and their tusks are *not* generally found deep below the tundra surface, but near the top of the permafrost, and this has been long known. As Tolmachoff stated in 1929:

"Everywhere carcasses of the mammoth and rhinoceros are found, they had been buried within the frozen ground of tundra NEAR ITS UPPER SURFACE and usually on comparatively elevated points, on the top of bluffs, etc. This has long been known."<sup>503</sup> (Capitalization added)

To reinforce this point regarding the depth of permafrost melt during the hipisothermal, Hurd C. Willet states, "At the time of the Climate Optimum . . . the Greenland and Antarctic ice caps decreased several hundred feet in thickness."<sup>504</sup>

According to Patrick Michaels in a published interview in *The Washington Times*, nearly all the computer generated models of a global warming of 1.5°C to 4.5°C or 2.7°F to 8.1°F due to a greenhouse effect would melt away the icecaps, even during the last Ice Age.<sup>505</sup> These General Circulation Models are far from perfect, but in spite of this, they would melt away the Ice Age continental icecaps over North America and Europe.

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<sup>503</sup>I. P. Tolmachoff, "The Carcasses of Mammoths and Rhinoceros Found in the Frozen Ground of Siberia," *Transactions of the American Philosophical Society*, Vol. 23, (1929), p. 51.

<sup>504</sup>Hurd, C. Willet, "Atmospheric and Oceanic Circulation as Factors in Glacial-Interglacial Changes of Climate," *Climate Change*, Harlow Shapley ed., (Cambridge, Mass., 1953), p. 56.

<sup>505</sup>Patrick Michaels, "Intelligence Lost in the Ozone," *The Washington Times* (January 14, 1992), p. F1.

If the continental glaciers covering both Greenland and Antarctica melted several hundred feet, then it is in perfect accord with the rest of the arctic basin's permafrost melting 200 to 300 feet.

William K. Stevens writing in *The New York Times* about a 1°C warming during the 1970s to 1990s and its affects in Alaska, states:

"The regions permafrost . . . is thawing in Alaska's interior, and pockets of underground ice trapped in the frost are melting with it. Over thousands of miles, big patches of forests are drowning and turning gray as the ground sinks under them and swamp water floods them. . . .

"About the magnitude of the warming, there is little doubt while the average surface temperature of the globe has risen over the last century by one degree Fahrenheit or a little more, it has increased over the last 30 years by up to about 5 degrees in Alaska, Siberia and northwestern Canada, say scientists at the University of Alaska and elsewhere. The warming has been most pronounced in winter. . . .

"Thirty years ago, the temperature of Fairbanks reached 80 degrees for only about a week in the summer. Now it hits or exceeds that mark for a total of about three weeks. On average, [Dr. Glenn P.] Juday says a summer day is about 11 percent warmer than it was three decades ago.

"Dr. Romanovsky said measurements from bore holes drilled into the ground show many areas are mere tenths of a degree from the melting point and will thaw if the warming continues. If the warming runs its course as predicted, thermo karsting [melting of the permafrost and collapse of the land in which it has lain] will eventually be complete, the permafrost line will have moved farther north (it has already migrated 80 miles [133 kilometers] in the last century in some places), . . ."<sup>506</sup>

Any tusks that had been deposited in the soil prior to the hipsithermal would have been ruined during the hipsithermal. Practically all of the tusks that are assumed to have been buried 10,000 years ago would have rotted or at best become useless. Only the most deeply buried tusks at below 200 to 300 feet, or 620 to 960 feet could have survived, and perhaps some in the very few bogs. However, mammoths and their tusks are found well above 200 to 300 foot depths and not in bogs. As Shipman well delineates:

"Peat bogs, swamp, and tar pits may be sites of unusual preservation events, with remarkably complete remains. Peat bogs seem to effectively tan bodies in the same manner that hides are tanned to make leather. Complete skeletons and intact soft tissues are reported from peat bogs in Denmark . . . and

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<sup>506</sup>William K. Stevens, "Dead Trees and Shriveling Glaciers as Alaska Melts," *The New York Times*, (Tuesday, August 18, 1998), pp. F1 and F5.

other areas of Europe . . . it is unfortunate that the more intriguing, extinct species have not been so preserved."<sup>507</sup>

One cannot, therefore, claim that the mammoths died out 10,000 years ago and that during the 3,000 to 4,000 years or more of the hipsithermal 25 percent of their ivory survived in good condition through those same thousands of years of temperate ground conditions.

If the ivory was deposited during the Pleistocene, solifluction lobes with vegetative roots would have covered it, leached it, and destroyed it. Even if the ivory was somehow deposited and preserved during the Pleistocene, during the ensuing thousands of years of warmth of the hipsithermal, the permafrost would have melted to great enough depth for it to have been exposed to the elements that would have destroyed it.

But, let us now assume that the mammoths did become extinct 10,000 to 12,000 years ago in the arctic basin; is it still plausible, probable, or even possible that thousands upon thousands of their tusks could have survived in good condition? The answer is categorically no. It may have been possible for a small number of tusks to be preserved, but it is immensely improbable that many, many thousands of mammoths died on the tundra in just the conditions to preserve their tusks. In summer, there are indeed endless bogs all across the arctic basin, but they are not very deep. Permafrost only melts 4 to 5 feet and a full-sized elephant would simply walk out of such a bog because the bottom is frozen permafrost. Even if it were deeper, elephants are great swimmers.<sup>508</sup>

Therefore, burial of a single mammoth whole or partially intact is an extraordinary event based on uniformitarian theory. But it is beyond the realm of the extraordinary to expect that thousands upon thousands of good tusks could have worked their way beneath the surface to the permafrost even under warm mammoth steppe conditions.

Furthermore, how could any of the mammoth mummies with flesh intact have survived the hipsithermal? As Tolmachoff also stated,

"No process of decay is possible under temperatures below the freezing point and in the case of the mammoth, rhinoceros, etc., it did not take place; because if it had, after many thousands of years of decaying even though it were a gradual process, no soft parts would have been preserved."<sup>509</sup>

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<sup>507</sup>Shipman, *Life History of a Fossil*, *op. cit.*, p. 56.

<sup>508</sup>I. T. Sanderson, *Dynasty of Abu*, *op. cit.*, pp. 81 and 85.

<sup>509</sup>I. P. Tolmachoff, "The Carcasses of the Mammoth and Rhinoceroses Found in the Frozen Ground of Siberia," *op. cit.*, p. 60.

If it is extraordinary to expect that any of the ivory survived the hipsithermal, then it is next to impossible to expect that the soft parts of mammoths in Siberia and Alaska, and any of the other extinct mammals in the muck of Alaska, would have survived with the flesh still undecayed with their red blood cells still intact. During the thousands of years of warmth of the hipsithermal, almost all of the bones, ivory, and flesh in the ground would have rotted and disappeared. And I reiterate in the strongest terms, the carcasses are found near the upper surface of the tundra. If only 100 feet of permafrost melted during the hipsithermal, the mammoth carcasses would have completely decayed away. This can only mean the preserved mammoth carcasses, ivory, etc., were buried after the hipsithermal 3,000 to 4,000 years ago when the ground became frozen permanently. There is simply no escaping this conclusion.

There is another piece of evidence that shows that the mammoth tusks, bones, and mummies were destroyed and buried after the hipsithermal ended and not 10,000 years ago. That evidence has to do with trees. Any wood left in the Siberian or Alaskan soil during the hipsithermal would be subject to two forms of destruction. Wood left in temperate soil over time rots, while wood left in warm water becomes waterlogged and then rots. Only under special bog conditions can wood be buried in such a manner to survive these forms of destruction. However, Howorth, citing Erman, states:

"It cannot escape notice that as we go nearer to the coast, the deposits of wood below the earth, and also the deposits of bones which accompany the wood, increase in extent and frequency. Here, beneath the soil of Yakutsk, the trunks of birch trees lie scattered, only singly, but on the other hand they form such great and well-stored strata under the tundras between Yana and the Indigirka, that the Yukagirs there never think of using any other fuel than fossil wood. They obtain it on the shores of lakes, which are continually throwing up trunks of trees from the bottom."<sup>510</sup>

The question is, when did all these unrotted and intact hundreds of thousands of trees live in the far north if not during the hipsithermal? We were told that during the previous interglacial the ground lost its permafrost for thousands of years, so that the only time that trees could grow and survive the ravages of time is at the end of the hipsithermal. According to the uniformitarians, the mammoths lived in a steppe environment. But we do not hear of forests growing on the steppes of Russia or on the Great Plains of the United States. The fact that these immense numbers of trees are buried in the same permafrost as the mammoths required again that the mammoths lived in a great forested area and not on a steppe or tundra. And since the rooted tree stumps that were discovered are not deeply buried, it is thus clear that they grew and were destroyed and frozen at the end of the hipsithermal. Pielou gives the usual uniformitarian explanations for denying that mammoths lived in the arctic in forests of large trees.

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<sup>510</sup>Henry Howorth, *The Mammoth and the Flood*, *op. cit.*, pp. 66-67.

"Apart from occasional poplar groves, however, the landscape [where mammoths grazed] was treeless and, like modern prairies and steppes, windswept. Tree growth was impossible in exposed sites for three reasons: water shortage, abrasive sand storms, and constant trampling by the hooves of grazing animals that would destroy tree seedlings as soon as they germinated."<sup>511</sup>

If all this made tree-growth impossible, one is left to wonder how and when all these trees somehow got into the ground with the mammoths at the end of the Ice Age.

Brown points out the problem related to all these untold number of trees lying in the ground of the arctic.

"Nordenskiöld . . . refers tree branches [in the arctic] which burn with a glow, without a flame, and which continue to be cast up every year in a northern Siberian lake, indicating submerged forest, beneath the surface of the water.

"At many places tree trunks have been found underground. These trees obviously did not grow underground, and under normal conditions, no fallen tree becomes buried. They must have grown above ground in some former epoch and then been buried by a cataclysm, for trees lying on the ground merely rot and decay. They are generally oxidized. . . . Under such conditions, they would disappear entirely before a hundred years have elapsed. But when trees are buried in water or damp earth, they are protected from oxidation, and are able to stay fresh for thousands of years."<sup>512</sup>

Again, the question is, how does one bury millions of trees all over the arctic basin rapidly enough to stop decay by oxidation? Uniformitarian theory will allow only a few cases to occur in a few select places, but only a catastrophe will create the burial of so much wood over so vast a region.

If, as is proposed, the mammoths became extinct at the end of the Ice Age and left their remains in the permafrost to be preserved, and the trees grew during the hypsithermal, we encountered a fundamental obstruction of putting these enormous number of trees into the same ground strata as the mammoths. In order for the trees to have gotten into the ground with the mammoths demands, the ground itself had to become unfrozen to allow this. Therefore, the fact that wood is associated with mammoths all across the arctic basin requires that the soil of the arctic basin had to be unfrozen to permit the burial of all this wood across this region. One simply cannot put mammoth bones and tusks into permafrost and thousands of years thereafter place untold millions of pieces of trees, or large tree stumps in the ground with them without melting the permafrost to allow this to occur, and if the permafrost melted to allow this, the

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<sup>511</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 151.

<sup>512</sup>Hugh Auchincloss Brown, *Cataclysms of the Earth*, *op. cit.*, pp. 30-31.

mammoths and their ivory would be destroyed. The point is that tall trees do not grow on permanent permafrost; they grow on soil that is unfrozen. The real requirement is that the trees and mammoths would only be found together if they were buried together rapidly or catastrophically.

The undisputed fact that untold numbers of tall trees are found in the same ground strata with mammoths all across unglaciated Siberia and Alaska is clear proof that the mammoths did not live on a steppe or a tundra which do not produce forests of tall trees. Since tall trees could only have grown in these arctic regions during the hypsithermal, it requires that the mammoths survived through to the end of the hypsithermal. Velikovsky decidedly pointed out that in the Alaskan Yukon, permafrost lay "smashed and . . . buried millions of bodies [of Pleistocene and modern mammals] and millions of trees."<sup>513</sup> For uniformitarians to then suggest that mammoths did not inhabit lands covered by trees becomes an absurdity. Where did all these millions of trees come from?

Sanderson discusses the force necessary to break full grown tree trunks. In New Jersey there was found a forest of cedar tree stumps the trunks of which were literally broken off above ground. Not far away lay buried in the ground thousands of cedar logs. But in

" . . . North America, these aerial monsters [hurricanes] take sort of sideswipes at our eastern seaboard year after year. . . . But while they have washed out roads and bridges and countless homesteads, and have *uprooted* trees and telephone poles . . . *never* has a healthy tree been reported to have been broken off near its base by any of these winds. Therefore, I am sorry to have to inform the 'experts' that the breaking-off of tens of thousands of enormous, deeply-rooted trees along the New Jersey [coast] was *not* accomplished by a hurricane. Whatever broke off these trees and left these stumps must have been a very great deal more powerful and sudden than a mere hurricane. . . . "<sup>514</sup>

To explain this Sanderson remarks:

"What force could do this? so far, I can envisage only one sufficient force—namely, a tsunami, which is to say, a gigantic wave suddenly rushing ashore from out of the open sea. . . .

"A tsunami strikes; the trees are firmly rooted and bend away from 'n'-million-ton onslaught and—this being so abrupt—they snap off like matchsticks leaving their stumps behind them. Off they go inland along with everything else . . . [and] lesser waves pass over them. . . . But then the counter-flow arrives from inland, bringing with it all the lesser stuff plus sand and fine silt; and as

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<sup>513</sup>Immanuel Velikovsky, *Earth in Upheaval*, *op. cit.*, p. 2.

<sup>514</sup>Sanderson, *Investigating the Unexplained*, *op. cit.*, p. 105.

these waters rock back and forth into the Atlantic, all this muck gets dropped on top of the trees."<sup>515</sup>

This process will explain why as one moves toward the arctic coast, more and more trees are found. But the force necessary to carry untold millions of trees to the arctic and not only bury them, but shatter them to ribbons, must have been of a much greater order of magnitude than Sanderson offers. Therefore, what is the force that would do this all across Alaska and Siberia?

It will also explain the somewhat arctic type flora found with the megafauna. A massive flood would wash up against the mountain ranges of Siberia and carry down from the heights the more alpine forms of vegetation that grew higher on these ranges back toward the Arctic Ocean. In this respect, Nikolai Vereschagin pointed out in 1967:

"The accumulations of mammoth bones and carcasses of mammoth, rhinoceros, and bison found in frozen ground in Indigirka, Kolyma [regions] and Novosibirsk islands bear no trace of hunting or activity of primitive man. . . .

"The descriptions of layers containing bones, skeletons, and carcasses of mammoth, rhinoceros, bison, and horse in the basins of the Indigirka, Vilui, Jana, and Kolyma rivers suggest the animals died . . . in great numbers and thus catastrophically. The corpses of herbivores were swept away with the floods into depressions. In summer these carcasses formed in boggy areas the so called 'mammoth horizon,' a thick layer consisting of bones, skulls, tusks, peat, and tree trunks interlocked by permafrost."<sup>516</sup>

Again, as Velikovsky pointed out, tree trunks are mixed in with the mammoths all across Siberia.

Vince Deloria explains the methods outlined to explain this problem.

"[Paul] Martin is no exception to this scholarly rule [of rejecting by pronouncement contradictory evidence]. In some areas of Alaska are deposits, politely termed 'muck,' which are simply large piles of broken animal bones, trees, some volcanic ash, and gravels. . . . Martin deals with this evidence in a peremptory way: 'Stratigraphic chaos, apparently the result of intense solifluction, has thus far defeated attempts at direct radiocarbon dating of the abundant remains of extinct horse, bison, and mammoth in Alaskan muck. . . . The dates, on wood associated with the bones, appear much too young to represent the true age of the fauna and are thought to be intrusive.'

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<sup>515</sup>*Ibid.*, pp. 112-114.

<sup>516</sup>N. K. Vereschagin, "Primitive hunters and Pleistocene extinction in the Soviet Union," *Pleistocene Extinctions: The Search for a Cause*, P. S. Martin, H. E. Wright eds., (New York, 1967), pp. 388 and 392

"'Intrusive' is a favorite concept for scientists who find that the data do not conform to theory. It means that you argue after the [animal] deposits you are examining have been laid down, trees . . . which were later deposited on the surface begin to worm their way into the soil and burrow until they become jarring discrepancies in the strata you are considering. If the muck deposits are a twisted mixture of intertwined bones, trees, and gravel, how can the wood be intrusive? Thus Martin explains away evidence that would conflict with his theory by spurious argument phrased in traditional scientific lingo."<sup>517</sup>

But why this intense solifluction did not eat up the bones as the trees wormed their way down we are not told. One must believe that all across the arctic basin from unglaciated Alaska, Canada, Northern Europe and Siberia trees got into the muck with extinct animals. How did they do that if, in order to preserve ivory, bones, and soft tissues, the permafrost had to stay frozen? One cannot shove large trees into permafrost which is as hard as rock. For the trees to be intrusive, the ground had to melt to allow them to gradually, over time, worm and burrow or sink below the surface. But once one melts the permafrost to do this, it must rot the ivory, bone, and soft tissue in the ground. That uniformitarians can offer such excuses speaks volumes about their allegiance to uniformitarianism.

However, other paleontologists understood that the process necessary to create the carnage and splintered tree destruction found across the arctic could only be the result of great catastrophic elements and attributed it "to a great tidal wave that uprooted forests and buried the tangled carnage in a flood of mud. In the polar region this froze solid and has preserved the evidence in permafrost to the present."<sup>518</sup>

For example, Lister discusses a mammoth found in Poland which, at the time of its burial, the ground was covered by permafrost.

"At Starunia in Poland, the subsoil is filled with veins of kerosene. The site is best known for its preserved rhinoceros carcasses, but in 1907 a mammoth was found at a depth of 140 ft. (43 m). There had been some decomposition before the tissues became embalmed, but this was still a mammoth 'in the flesh'—the only one outside the [present] permafrost regions—. . ."<sup>519</sup>

However, arctic permafrost contains frozen materials found to very great depth as described by E. M. Benson, Vice President of the North American Producing Division of the Atlantic Richfield Oil Company, who said, "Drilling down through the 1,000-foot thick frozen earth [of Alaska] can produce some surprises. One of our [oil] wells brought

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<sup>517</sup>Vine Deloria, *Red Earth White Lies*, *op. cit.*, p. 119.

<sup>518</sup>*Polar Wandering and Continental Drift*, Society of Economic Paleontologists and Mineralogists, Special Publ. No. 10, (Tulsa, OK, 1953), p. 165.

<sup>519</sup>Lister, *Mammoths*, *op. cit.*, p. 57.

up an 18 inch long chunk of tree trunk almost 1,000 feet below the surface. It wasn't petrified—just frozen."<sup>520</sup>

All kinds of fragments of trees and animals are buried to great depth in the permafrost and they could never have gradually worked their way down to much depths. Permafrost only melts a few feet during the summer. Therefore, it would be liberally impossible for bones or tree materials to become buried deeply. The arctic permafrost is as hard as rock, and under no ordinary conditions can wood or bone insinuate itself deeply into permafrost ground. Yet all across the arctic to great depths are found these vestiges of animals and trees. This is impossible based even on the uniformitarian concept, but not on a catastrophist one.

Could the great bone beds of the arctic have been formed if the habitat there was a mammoth steppe with permafrost well below the surface to permit all the various forms of mosaic vegetation to thrive? Unfortunately, the answer is no. There are great grassland prairies in the American Midwest today that are, in many respects, quite similar to the imagined mammoth steppe of Siberia and Alaska. Yet they are not loaded with bone beds all across them. The same applies to the Russian steppes and those of Mongolia. Buffalo have roamed in the millions over the American prairies for millennia, but when they die, their bones are rarely preserved. Animals that die on the surface of a prairie are quickly eaten by a host of scavengers and the bones disintegrate. Sedimentation on grasslands is an extremely slow process which would cover any bones or carcasses.<sup>521</sup> This would also be true of the mammoth steppe and, therefore, the bone beds across Siberia and Alaska could not have formed if the environment contained a vegetational mosaic.

Let us now examine this concept of permafrost from yet another perspective. Geoffrey Bibby, in *The Testimony of the Spade*, describes the homes of man in areas of present day Russia where mammoths lived alongside of humans. He speaks of

"... houses . . . discovered by Soviet archaeologists at a . . . station of mammoth-hunters at Megina near Kiev, and another at Pushkari in the Ukraine. Here half-subterranean houses were found, ringed about with substantial walls of heavy boulders and with a row of open hearths down the length of the buildings. It is probable that the houses were roofed over with skins."<sup>522</sup>

What Bibby has failed to understand is that if the house was built in permafrost ground as the present theory suggests, (Kiev in Russia, above 50N latitude, is equivalent to Winnipeg in Canada, and thus during the Ice Age, would be underlain by permafrost), then the heat from the hearths would be transferred to the substantial walls of heavy boulders and then to the permafrost which would melt and flood the house with water.

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<sup>520</sup>Anonymous, "Much About Muck," *Pursuit*, (October, 1969), pp. 68-69.

<sup>521</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, pp. 140, 187.

<sup>522</sup>Geoffrey Bibby, *The Testimony of the Spade*, (New York, 1956), p. 136.

There is simply no getting around this problem except to suggest that during the Ice Age there was no permafrost in the region of Kiev. This is clearly not a reasonable nor a plausible concept. The way to have human beings living in northerly Russia in houses half submerged is to have them do so during the hipsithermal. During the Ice Age, numerous forms of evidence point unquestionably to the fact that northern Russia and much of South Russia, as well, was covered by permafrost.<sup>523</sup>

The same is found in Alaska. Velikovsky has informed us,

"In 1939 and 1940 'one of the most startling and important finds of the century' (E. Stefanson) was made at Point Hope in Alaska on the shores of the Bering Strait; an ancient city of about eight hundred houses whose population had been larger than that of the modern city of Fairbanks [in that time] was discovered there, north of 68 degrees, about 130 miles within the Arctic Circle."<sup>524</sup>

The archeologists assign this city to Norton culture, which they suggest existed some 2,000 or more years ago. However, the tombs and houses contained logs fashioned for use by the people, which suggests they had abundant tree materials and thus points to their occupation of this city during the hipsithermal period. Most archeologists refuse to accept the placement of Ipiutak as part of Norton culture. But importantly, the houses were constructed so that their floors were below ground level. Therefore, if they warmed their homes with fire, they would have melted the surrounding permafrost and flooded their homes. Because this city is found 130 miles north of the Arctic Circle, it would be subjected to months of unending winter darkness. Yet the people "did not have seal oil lamps, sleds or slate tools."<sup>525</sup> This, of course, implies a poleshift to allow day-night periods throughout the year. Some researchers suggest Ipiutak was only inhabited during the summer to escape this problem. But in summer, permafrost melts about five feet and the houses partly below ground would again be flooded.

To sum up this evidence, I conclude that if an animals were deposited in permafrost *via* solifluction lobes, they would be destroyed—both soft tissues and hard (bones and tusks). If these animals and trees were deposited in temperate soil, most of the wood and almost all the ivory, and soft tissues would decay and rot away while very many fewer numbers of bones would survive than are found. The only way to bury and preserve together immense amounts of wood, bones, carvable ivory, and frozen carcasses with their soft tissues in relatively good condition is to bury them rapidly in temperate soil and freeze the soil almost immediately thereafter. The only time this process could occur is about 3,500 years ago at the end of the hipsithermal.

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<sup>523</sup>Lister, *Mammoths*, *op. cit.*, p. 107.

<sup>524</sup>Velikovsky, *Worlds in Collision*, *op. cit.*, pp. 327-328.

<sup>525</sup>*National Geographic on Indians of the Americas*, (Washington, DC, 1955), p. 167.

All theories that claim the mammoths died by gradualistic or catastrophic causes 10,000 years ago must either come squarely to grips with these many contradictions or turn to ad hoc explanations that deny these facts or ignore this evidence, as did Martin.

There is one additional point which is explained by the view that the mammoths lived in the arctic during the hipsithermal. I have, at the beginning of this work, discussed the ability of large Pleistocene genera to negotiate their tundra environment in summer, when it became swampy and the ground was so soft that these large creatures would sink into the soft substrate and moving across the ground would become a nightmare. However, during the hipsithermal, the permafrost is understood to have melted and the surface water drained away. Not only did this permit grasses and trees to grow, but the ground itself would have become more solid in structure, and all the various megafaunal species would have had no difficulty going about their business. Lions could run to kill or trap their prey over this soil. Prey could run to escape their predators, much as they do today in Africa. The entire question of how these animals moved about in summer simply evaporates with the removal of the permafrost. As with all the problems encountered by the uniformitarians and catastrophists who posit a 10,000 year extinction, this question of the facility for quadruped locomotion is simply and logically explained. No ad hoc theories are required to make it work. It simply works without ad hoc inventions.

In retrospect, all the evidence indicates that the mammoths lived in the arctic basin during the hipsithermal and not during the Ice Age, for rather definitive reasons. All the evidence points to that conclusion, but this is not acceptable to an establishment that is imbued with the belief that these giant, magnificent creatures lived in a region that they fully understand could not and did not provide them with the sustenance they required. There is, therefore, no explanation to the question of where and how these animals in great numbers derived their nourishment. In spite of these categorical contradictions, the uniformitarians still cling to their theses and have only one argument left with which they maintain their position. That argument is based on radiocarbon dating of these organisms and associated organic materials found with them. They inform us that this dating method indicates quite clearly that the mammoths became extinct about 10,000 and not 3,500 years ago. Let us, therefore, examine this last support for their theory.

## RADIOCARBON DATING THE EXTINCTION

Radiocarbon dating is the final support, and only support for the contention of the age of the extinction. Hitching who discusses Velikovsky's theory claims that the catastrophe he posits will not stand up to this dating methodology. "When did the cataclysm happen? Almost certainly not in the time proposed by Velikovsky (*c. 1500 B.C.*), for radiocarbon dates on various mammoth specimens range from 30,000 to 10,000 B.C."<sup>526</sup>

As Haynes says, "According to radiocarbon dates, a proboscidean crisis occurred 10,000 to 12,000 years ago, the interval when mammoths and mastodons disappeared from the world."<sup>527</sup> But he also admits that "some would say they disappeared later."<sup>528</sup> This later extinction possibility Haynes and the other uniformitarians are clearly unwilling to examine presently or admit openly. To drop this 10,000 year extinction date would destroy both the hunting and climate hypotheses. Hence, a later extinction is a deeply disturbing possibility that would bring down their uniformitarian house. Here is a thumbnail sketch of how the radiocarbon data was debated at a recent conference in Brussels, Belgium.

"The greatest debate between [sic] various researchers into the Pleistocene elephant extinction is related to carbon-14 dates, for even though most carbon-14 dates suggest that the extinction took place over a short period of time, some researchers have suggested that many carbon-14 dates recovered during the early years of the method are in error. New methods have also called into question many dates produced more than 20 years ago, dates that are absolutely crucial in identifying the killer of the Ice Age fauna. There is no shortage of emotion among the various scientists defending their older findings. . ."<sup>529</sup>

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<sup>526</sup>Hitching, *The Mysterious World*, *op. cit.*, p. 54.

<sup>527</sup>Haynes, *Mammoths, Mastodons, & Elephants*, *op. cit.*, p. 264.

<sup>528</sup>*Ibid.*

<sup>529</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 40.

Some scientists suggest the extinction occurred in about 1,000 to 2,000 years. The defenders of the older dates supporting a much longer period for the extinction to take place refuse to question these earlier dated materials. This being the case among uniformitarians, one can well imagine the emotions that would be expressed over the views presented here that the mammoth extinction took place in a day by a catastrophe.

Although practically nothing else fits their mammoths-in-the-arctic, Ice Age theory, radiocarbon does. Hence, the onus of *proof* that this dating should be otherwise is on those who deny this. The answer to the resolution of this dating evidence breaks down to two or three questions. How accurate is this dating method, and has the data been culled or abused to support the established theory, rather than test it? Are there radiocarbon dates which show that many of the extinct mammals that are assumed to have become extinct 10,000 years ago were actually living well into the hypsithermal? And lastly, but most important of all, are there *natural causes* that would make the radiocarbon dates far older than 3,500 years, the date which Velikovsky posited for mammoths in the far north?

Before addressing these questions, I wish to examine the very nature of the way discordant evidence is handled even by sincere and honest researchers to arrive at the answers they expect should be found. Velikovskians have often been accused of only using data that conforms to his theory while disregarding or ignoring that evidence which does not. Nevertheless, I maintain, the behavior of the scientific establishment, while hurling these accusations at Velikovsky and his supporters, is contrary to the real evidence, as for example, with what was shown happens to scientists such as Lee or McIntyre who challenged the established dogma.

Evan W. Mackie makes the thinking of scientists clear on the issue of preconception in science and academia.

"Dr. Edward de Bono's book on practical thinking . . . makes interesting reading for archaeologists, and indeed for those concerned with the problems of interpretation in the historical sciences, with the aid of an ingenious experiment, he analyzes the way the human mind works and identified 'five ways to be wrong,' 'four ways to be right,' and 'five ways to understand.' Among the ways to be right—which means ways in which one can convince oneself one is right—is what he calls the 'village Venus,' or 'unique rightness' method, a mental process which he believes to be particularly common among scientists and academics. If one has lived one's whole life in a remote village, cut off from contact with other people, the village Venus must be the most beautiful girl in the world because one cannot imagine anyone more beautiful. In the same way a scientist or scholar who cannot imagine, or who has not heard of any explanation which will fit a given body of evidence, as well as the one he has thought of (or, one might add, has been taught), is capable of being fully convinced of its unique rightness. Consciously he tells himself, and believes, that it is right because it

fits all the facts; but actually its rightness derives solely from the lack of rival explanations."<sup>530</sup>

Stephen Jay Gould explains why and how experimental results that give negative results to established theory is handled to make the established theory appear to be right compared to any rival explanation.

"The great bulk of scientific work never sees the light of a published day . . . Truly false starts are deposited in circular files—fair enough. But experiments carried forth and leading to negative results end up, all too often, unpublished in manila folders within steel-drawer files, known only to those who did the work and quickly forgotten even by them. We all know that thousands of novels, considered substandard by their authors, lie in drawers throughout the world. Do we also understand that experiments with negative results fill even more scientific cabinets?

"Positive results, on the other hand, tell interesting stories, and are usually written up for publication. Consequently, the available literature may present a strongly biased impression of efficacy and achieved understanding."<sup>531</sup>

That is, the belief in the rightness of the theory is not based on *all* the evidence. In essence, when you don't believe the results or when it can damage your career by reporting evidence that contradicts the prevailing paradigm in radiocarbon dating, (as we described above with respect to South American researchers who withheld data from man in the Americas prior to 12,000 B.P.) negative results rarely see the light of publication. Yes, here and there, some of it is presented, but this is the very rare exception. Even statistical analysis cannot correct the problem because too much of the critical data is missing. As Gould further states: "But statistics cannot rescue us when we hide our non-light [unpublished negative data] under a bushel . . . —that is, when we publish only positive results and consign our probable negativities to non-scrutiny in our file drawers."<sup>532</sup> However, the problem is even more pernicious because Gould then goes on to show that journals strongly tend to publish positive results far more often and refuse too often to publish the negative results that will upset the whole applecart.<sup>533</sup>

Thus, when Velikovsky attempted to have materials carbon 14 dated from the tomb of Tutankhamen which he claimed was dated close to the 7th century B.C., by the British Museum:

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<sup>530</sup>Evan W. Mackie, "Wise Men in Antiquity," *Astronomy and Society in Britain During the Period 4,000-1,500 B.C.*, C.L.N. Ruggles, A. W. R. Whittle, eds., (Oxford, Eng., 1981), p. 111.

<sup>531</sup>Stephen Jay Gould, *Dinosaur in a Haystack*, (New York, 1995), p. 124.

<sup>532</sup>*Ibid.*, p. 125.

<sup>533</sup>*Ibid.*

"In spring, 1971, . . . the British Museum processed palm kernels and mat reed from the tomb of Tutankhamen. The results according to Dr. Edwards, Curator of the Egyptian Department . . . was -899 and -846 respectively. These dates were *never* published.<sup>534</sup>

Worse than that, when an inquiry was made to the British Museum regarding this information, the British Museum denied ever having carried out the tests via radiocarbon. Therefore, one can see quite clearly how wretched the upholders of the establishment are when radiocarbon evidence contradicts their dogma. This is not hiding one's light under a bushel, but destroying the evidence and burying it in the Earth.

"There is, however, another more insidious and pervasive kind of cheating—the routine editing and reclassifying of data according to rigid theoretical preconceptions.

"Vayson de Pradenne, of the École d'Anthropologie in Paris, wrote in his book *Fraudes Archeologiques* (1925): 'One often finds men of science possessed by a pre-conceived idea, who, without committing real frauds, do not hesitate to give observed facts a twist in the direction which agrees with their theories. A man may imagine, for example, that the laws of progress in prehistoric industries must show itself everywhere and always in the smallest details. Seeing the simultaneous presence in a deposit of carefully finished artifacts and others of a coarser type, he decides that there must be two levels: the lower one yielding the coarser specimens. He will class his finds according to their type, not according to the stratum in which he found them. If at the base he finds a finely worked implement he will declare there has been accidental penetration and that the specimen must be re-integrated with the site of its origin by placing it with items from the higher level. He will end with real trickery in the stratigraphic presentation of his specimens; trickery in aid of preconceived ideas, but more or less unconsciously done by a man of good faith whom no one would call fraudulent. The case is often seen, and if I mention no names it is not because I do not know any.'

"This sort of thing goes on not just in the British Museum, but in all museums, universities, and other centers of paleoanthropological research the world over. Although each separate incident of knowledge filtration seems minor, the cumulative effect is overwhelming, serving to radically distort and obscure our picture of . . . antiquity."<sup>535</sup>

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<sup>534</sup>Immanuel Velikovsky, "The Pitfalls of Radiocarbon Dating," *Pensée*, Vol. IV, (Spring/Summer (1973), p. 14.

<sup>535</sup>Cremona, Thompson, *Hidden History of the Human Race*, *op. cit.*, p. 189.

In fact, this accusation of seeing uniformity as opposed to catastrophe goes back to Lyell's day.

"[Adam] Sedgwick and his friends believed that the plain evidence to be seen in the field demanded explanation in terms of occasional episodes of great violence. Lyell, they argued, had to explain that evidence *away* by assuming for example that there were vast unrecorded tracts of time that created an illusion of sudden violence. The catastrophists, not the uniformitarians, claimed to be the plain no-nonsense empiricists in this debate . . . [A] cartoon by [Henry] De La Beche makes the point perfectly . . . Lyell the barrister, his critics felt was offering them [uniformitarian] coloured spectacles of interpretation, which distorted the plain sense of their observation, the distortion was due to the theory embodied in the view point Lyell stood on, and in his book that he was concealing behind his back."<sup>536</sup>

The viewpoint that a scientist brings to the data he will interpret is a pair of uniformitarian spectacles that, in fact, blinds him to any other interpretation, especially recent catastrophes. This myopic vision spans the gamut of all the fields associated with phenomena examined in this book.

The very same emphatically applies to radiocarbon dating. As we will see, there are several dates that slipped out that indicate there were probably a great many more that were merely dropped lying in file cabinets or rejected for publication.

What is being charged here is that evidence is not being used to test hypotheses regarding the ancient past, but only to support them, and this problem has been fully admitted by those involved in just this research. Bowen claims that this is precisely what is done with this research.

"Indeed it could be said that force-fitting of the pieces into preconceived pigeon-holed classifications is what is almost a way of life for the Quaternary worker. . . . Tendencies to oversimplify in this way lead to new discoveries being forced into pigeon-holed classification. Such arbitrary methods tend to perpetuate an illusion of security and precision in an apparently repeated confirmation of the original model. This tendency to confirm discoveries from limited amounts of data has been called The Reinforcement Syndrome."<sup>537</sup>

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<sup>536</sup>Martin Rudwick, "Darwin and Catastrophism," *Understanding Catastrophe*, Janine Bourriau ed., (Cambridge, Eng., 1992), pp. 69-70.

<sup>537</sup>D. Q. Bowen, *Quaternary Geology, A Stratigraphic Framework for Multidisciplinary Work*, (New York, 1978), pp. 7-8.

Deloria, who examines a quite typical manipulation that occurs with radiocarbon dating, tells that

"[Alex] Krieger . . . [discussed] the archaeological discoveries at the Lewisville site northwest of Dallas, Texas. The excavators found a Clovis fluted point and conducted radiocarbon tests on associated vegetable materials found in the Heath No. 1. These tests produced dates greater than 37,000 years . . .—a real embarrassment to scientific doctrine because the makers of the Clovis points were not supposed to be in North America until around 15,000 years before the present. So the Lewisville site really marked a breakthrough in knowledge of the Pleistocene past of North America. But Krieger's own response to this discovery was the following:

' . . . as I pointed out soon after discovery, there are alternative explanations, among them the distinct possibility that the Clovis point was planted in the hearth by someone not connected with the excavation or that, by some incredible accident, machinery used to excavate the huge burrow pit in which this and other hearths were exposed somehow caused the point to be dragged or lowered to this position.'

"You will note that the Clovis point did not come under suspicion until the radiocarbon dating produced dates that were unsatisfactory."<sup>538</sup>

The very same kind of accusation was made by two researchers, Jean-Philippe Regaud and Jan F. Simek.

"Recent prehistories are post hoc constructs attempting to account for the observed record. (C. F. Binford, 1982). Almost by definition, this accommodation process suffers from a lack of empirical sufficiency, that is, allows no systematic model testing . . . Data are, in fact, used in model construction (the models are fitted to the data observed) and only those dimensions of the data *supporting* model construction are considered. . . .

"This is particularly distressing when prehistorians actually acknowledge such problems but do not take them into account."<sup>539</sup>

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<sup>538</sup>Deloria, *Red Earth White Lies*, *op. cit.*, pp. 109-110.

<sup>539</sup>Jean-Philippe Regaud, Jan F. Simek, "Paleolithic Prehistory in France," *The Pleistocene Old World Regional Perspectives*, Olga Soffer ed. (New York, 1987), pp. 48-49.

What all of this comes down to is something philosophers of science have been saying over the last 25 or so years. Norwood Hanson and Paul Feyerabend have long denied that there is an objective scientific observation or interpretation apart from a theoretical framework. Hanson states that all observations are "theory laden."<sup>540</sup>

Feyerabend claims that because facts are largely dependent on theory, the discovery of new facts which conflict with the theory that leaves one with the option of either changing the theory or simply rejecting the facts.

"Facts and theories are much more intimately connected than is admitted. . . . Not only is the description of every single fact dependent on *some* theory . . . but there always exists facts which cannot be unearthed except with help of alternatives to the theory to be tested, and which become unavailable as soon as the alternatives are excluded."<sup>541</sup>

As we have seen, the catastrophist facts and timeline as applied to the mammoth extinction fact have simply been excluded *à priori* for over 150 to 175 years. And what has happened is that the theories to explain the facts have become further and further removed from reality. In essence, the first principle of science—that the theory be interpreted in terms of facts—was jettisoned and replaced by the interpretation of evidence known only in terms of earlier biases based on prior theory. As Parker admits, "In some ways, a lay person is better equipped to see a relationship among geologic features, because he or she doesn't carry the intellectual prejudices that a professional does."<sup>542</sup>

There are probably a great many other such admissions in the literature not yet discovered by this author, but the fact is that the analysis of evidence has been fashioned by the uniformitarian scientists on all levels to only make the data fit their uniformitarian model and to shunt aside, ignore, reinterpret, and even suppress data that does not accommodate their gradualist model. Often researchers, such as I, are accused of not working by the objective, scientific method. However, the facts indicate that those who make such accusations are simply blind with respect to the lack of scientific objectivity in the very areas of research they are themselves upholding as proper paradigms, and accuse others of failing to see what is obvious to them. As Derek Ager remarked about evidence for catastrophism, "I cannot help thinking that people find things that they expect to find. As Sir Edward Bailey . . . said, 'to find a thing you have to believe it to be possible'."<sup>543</sup>

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<sup>540</sup>Norwood Hansen, *Patterns of Discovery*, (Cambridge, Eng., 1961), p. 54 *ff.*

<sup>541</sup>Paul Feyerabend, *Against Method* (London, 1978), p. 27.

<sup>542</sup>Parker, *The Tenth Muse*, *op. cit.*, p. 4.

<sup>543</sup>Derek Ager, *The New Catastrophism*, (Cambridge, Eng., 1993), pp. 190-191.

But because for the past 150 or more years catastrophism was not believed to be possible, it could not be envisaged or acknowledged. As we will see, radiocarbon dating is not different when handled by scientists who are quite sure that their preconceived chronology is not a bias but a fact of science.

An excellent example which illustrates how the paradigm determines what is found in radiocarbon testing is the 32 radiocarbon assays made on Hohokam artifacts as delineated by Emil W. Haury.

" . . . It would be an understatement to record that the [radiocarbon] results were in agreement with each other. The opposite is the case. The task of sorting out those dates that appear usable from those that are obviously incorrect and justify one's selections is not simple. It is unthinkable, however, that dates for the Vahki Phase materials as far apart as  $425 \pm 115$  B.C. and A.D.  $1020 \pm 120$ , or for the Sacaton Phase of A.D.  $900 \pm 100$  and  $1820 \pm 110$  can all be correct. These discrepancies force a choice. To do otherwise would land us in a chronological quagmire.

"The reason or reasons for these disparities may be many, ranging from the selection, collection, and recording of samples in the field, to contamination, and analytical errors in laboratory processing, and even to the assumptions on which isotope dating is based. It is not my intent to try to determine where the problem lies. However, I firmly believe that in making a qualitative judgment about the value of dates, an intimate knowledge of field problems and of the nature of the cultural complex under study is fundamental to the decision. . . . My dependence on certain radiocarbon dates and rejection of others will not be pleasing to everyone, but these judgments must be made. If the complications arising from the establishment of a chronology . . . have taught us anything, it is that we are far from reaching a finite level of expertness in the art of dating. . . .

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That is, the range of dates ran from 425 B.C. to 1820 A.D. covering a range of 2,245 years. That large a range clearly shows that carbon 14 dating is capable of falling into an extremely broad range and then by selecting the date one believes is correct completes the process of circular reasoning. As one can see, Haury simply assumed all his prior understanding of the dating of the Hohokam was correct and rejected those dates that were in clear violation of those assumptions, or to be more accurate, his assumptions are really a belief system. Once Haury's paradigm suggested only certain dates for Hohokam chronology, any findings deviating from that paradigm had to be systematically removed. And please note, Haury did not attempt to isolate the discarded dates from those that he accepted by determining which were contaminated, or laboratory errors or anything else. In good science, this would have been the correct procedure. Instead the paradigm decided what was acceptable and what was not. Stephen Jay Gould makes this concept clear:

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<sup>544</sup>Emil W. Haury, *The Hohokam, Desert Farmers and Craftsmen, 1964-1965*, (Tucson, 1976), p. 333.

" . . . everyone is controlled by the theories they accept—you may be objective with your observations, but there are an infinite number of observations you could be making—the ones you choose to make are theory-bound. They may be so theory-bound that there is no conceivable way that they can refute the theory."<sup>545</sup>

This somewhat lengthy discussion of how data is modeled, published, etc., was given to show that what is often presented regarding the late Pleistocene and hypsithermal periods has scientific explanations and proof which are, far too often, underpinned by unproven assumptions that are regarded as facts.

Before beginning this analysis of radiocarbon dating, it is important that what has already been analyzed be explained in terms of this dating method. The pollen analysis categorically proves that the arctic region was an uninhabitable, frozen desert for megaherbivores all during the last 30,000 years of the Pleistocene. This is based on dating of varves (layers in lakes) that can be counted well back into the Ice Age. This varve evidence proves that neither grass nor trees nor large mammals lived in the far north up until about 8,000 years ago. However, the radiocarbon dating says exactly the opposite. Now either the radiocarbon dating method is wrong or the varve method of dating is wrong. However, though the varves in one lake can be in error by a few hundred to even several hundred years in unglaciated Alaska, they cannot be in error by many thousands of years. But this is not true for radiocarbon dating as we will see.

The palynologists say, on the basis of the varve pollen stratigraphy chronology, that the mammoths could only have lived in the arctic during the interglacial period of which the last ended 125,000 years ago, or during one of the interstadial periods which ended over 35,000 years ago. However, radiocarbon dating places most mammoths in the polar areas from about 35,000 to around 11,000 years ago. This means that nearly all these radiocarbon dates are not valid based on the varve chronology. Since radiocarbon is accurate back in time to about 45,000 years, none of the mammoths from the last interglacial could leave a radiocarbon date; nearly all the radiocarbon would have decayed making it impossible to date these animals. Thus, based on the varve chronology, most of the radiocarbon dates from the arctic regions are deeply in error. To make abundantly clear about how radiocarbon dating can be denied by the very same scientists and scholars who claim it is a highly valid measuring rod by which to date the past, let us examine the following evidence. According to Schiller, a researcher in Thailand discovered the bones of a man

" . . . [w]ho had died over 5,600 years ago . . . , but his discovery may render obsolete time-honored beliefs about where and when fabrication of metals began. For buried close enough to the man for his skeletal arm to have reached out and

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<sup>545</sup>William Glen, "On Mass-Extinction Debates: An Interview With Stephen Jay Gould," *The Mass-Extinction Debates*, W. Glen, ed., (Stanford, Calif., 1994), p. 263.

seized it, lay a beautifully fashioned bronze spearhead whose wooden shaft had long since crumbled to dust. It is the most ancient bronze object yet unearthed in the world, six centuries older than anyone suspected bronze had been made. And it was found where archeologists least expected it—beneath a village in northeast Thailand."<sup>546</sup>

Earthenware pots were found with bold swirling designs never before seen, which were sent to the University of Pennsylvania's University Museum in Philadelphia and dated *via* thermoluminescence. The vases had been created about 6,000 years ago. Froehlich Rainey, the museum's director, astonished by the date, tested others at Philadelphia and Oxford University, which produced even older dates. Further, bronze artifacts were found alongside the ceramics.<sup>547</sup>

This discovery challenged all traditional views which held that these earliest civilized productions had originated in Mesopotamia, Egypt, India, and China. It was believed pottery making and metallurgy came to Thailand after 800 B.C. At Non Nok Tha, Wilhelm Solheim and his team of the University of Hawaii, found bronze axeheads and the molds from which they had been cast in a stratum older than Mesopotamian or Chinese bronzes. In a 10,000 B.C. layer at Spirit Cave in northern Thailand, Chester Gorman, a graduate student, discovered carbonized pieces of water chestnut, cucumber, pepper, bottle gourd, and other food plants showing the Thais were carrying on agriculture 2,000 years prior to the Mesopotamians. Shards of pottery of an advanced kind were also found in the cave dated to 6,800 B.C.<sup>548</sup>

Now all of these dates were derived from scientific radiocarbon testing laboratories and proved (if one accepts carbon-14 dating) that Thailand was the earliest advanced civilized community on Earth. These people were like the Chaldeans who apparently lived in tents, since houses for them were not discovered. But did the historians embrace this discovery and the fact that radiocarbon buttressed it? Of course not.

"A number of archeologists, however, have serious doubts. . . . They contend that Gorman and [Dr. Pisit] Charoenwanga of the National Museum in Bangkok derived their only unquestionable dates from analysis of fragments of wood found close to the skeletons and artifacts. Since the mound that was excavated . . . had been used for centuries as a burial ground, they argue such fragments of wood are an unreliable guide to the age of the objects. Each new

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<sup>546</sup>Schiller, *Distant Secrets*, *op. cit.*, p. 75.

<sup>547</sup>*Ibid.*, p. 78.

<sup>548</sup>*Ibid.*, pp. 78-79.

burial must have disturbed the fragments and soil layers, and penetration by plant roots has moved the earth still further."<sup>549</sup>

But if burials occurred, the wood would be that of trees from above which should make them date closer to the present, not older. The researchers "identified seven separate layers of remains. . . . The lowest, reaching back to about 3,600 B.C., was some 16 feet (5 meters) below ground level; and it was here that the diggers found their historical bombshell."<sup>550</sup> If the burials were truly disturbed, how could seven separate levels of remains exist? Digging would have destroyed these and left a jumble of remains not a series of levels.

"A more reliable guide to the age of the bronzes, say the doubters, is the age of the skeletons themselves—and analysis of some of the bones suggests that they date from sometime between 750 and 50 B.C."<sup>551</sup>

But, as we will shortly learn, researchers in the field of radiocarbon dating say just the opposite, namely, that wood is a superior dating material to bone. Notice that only "some of the bones . . . date from sometime between 750 and 50 B.C.," while most do not. Therefore, if the data from radiocarbon fits the theories of historians, it proves their case. When data from radiocarbon contradicts the theories of historians, they find various reasons to cast doubt on it. Suppose it were the other way around, that is, that the skeletons dated to 3,600 B.C. while some of the wood dated to between 750 and 50 B.C., the historians would be arguing for the radiocarbon validity of the wood and against that of bone. In our discussion below of the Beresovka, the paleontologists did just this; they rejected the radiocarbon dates of pollen, which did not fit their theory, for the radiocarbon dates of tissues, which did!

Although the discovery was made in the late 1960's, the academic scholars were vehement in denying this new civilization. The lesson to be learned is that radiocarbon dating is not employed to test theories, but to support them. As Dr. Roger Wescott told me when I spoke with him by telephone about this on April 17, 1997, radiocarbon always gives a scattered set of dates. The theorists then pick the ones that they believe to be correct. In essence, no evidence from Carbon-14 dating can be fully incorporated by the establishment if it fails to support the dogma of these researchers. They simply do not believe it.

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<sup>549</sup>Nicholas Best, Janet Abbott, *et al.*, "Who were the first metal-workers," *Quest for the Past*, (Pleasantville, N.Y., 1984), p. 28.

<sup>550</sup>*Ibid.*

<sup>551</sup>*Ibid.*, p. 29.

For example, John Alszszatai-Petheo wrote about the debate of the 4,000 year view of Hrdlicka and Holmes prior to radiocarbon dating.

"For . . . decades, American archaeologists would labor under the view of man's relative recency in the New World, while the mention of the possibility of greater antiquity was tantamount to [committing] professional suicide. Given this orientation, it is not surprising that when the evidence of the antiquity of man in America was finally reported from Folsom, Clovis, and other High Plains sites, it was rejected out of hand by established authorities despite the clear nature or the evidence at multiple locations, uncovered by different researchers, and seen and attested to by a large variety of professional visitor/observers. . . . The mind set of the conservatives left no room for acceptance."<sup>552</sup>

This, of course, occurred before radiocarbon dating became a tool of anthropology. Nevertheless, Alszszatai-Petheo also claims that the discoveries made after radiocarbon was introduced to this area of research are as rigidly rejected by the new conservatives who inherited the mantle of Hrdlicka and Holmes. That is, they have rejected out of hand any radiocarbon dates that showed man was in the Americas at least 30,000 years ago.

According to J. L. Lorenzo and L. Mirambell, digs carried out at el Cedral, in the state of Sinaloa, Mexico, contained human artifacts and the bones of an extinct elephant lying in "undisturbed stratified deposits on layers of charcoal which were radiocarbon-dated at 33,000 B.P., 31,850 B.P., 21,960 ± 540 B.P., and older than 15,000 B.P."<sup>553</sup> Here we had radiocarbon validating the theory that people lived in the Americas prior to 12,000 B.P. But this was totally unacceptable to the conservative elements in anthropology, archaeology and paleontology and the evidence was rapidly rejected.

Again, charcoal unearthed from a fireplace on Santa Rosa Island, California analyzed by Rainer Berger, an archaeologist at UCLA's radiocarbon testing laboratory, showed practically no measurable carbon-14 which indicated the crude tools alongside a large mammoth at the site had to be older than 40,000 years.<sup>554</sup> Once again, the radiocarbon date and artifacts were rejected by the establishment as acceptable evidence for dropping their 12,000 year dogma.

However, the strongest evidence from radiocarbon testing to support man being in the New World also came Pedra Furada. Charcoal from the deepest fireplace in the strata gave dates of 3,700 ± 830 years and 32,160 ± 1,000 years. Furthermore, an entire series

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<sup>552</sup>John Alszszatai-Petheo, "An alternative paradigm for the study of early man in the New World," *New Evidence for the Pleistocene Peopling of the Americas*, Al Bryan ed., (Orono, Me., 1986), pp. 18-19.

<sup>553</sup>J. L. Lorenzo, L. Mirambell, "Preliminary report on archaeological and paleoenvironmental studies in the area of El Cedral San Luis Potosi, Mexico, 1977-1980," *New Evidence for the Pleistocene Peopling of the Americas*, A. L. Bryan, ed., (Orono, Me., 1986), p. 107.

<sup>554</sup>*Science News*, (1977), p. 196.

of radiocarbon dates consistently became older as the researchers dug deeper into the site, going from 6,160, 7,750, 7,640, 8,050, 8,450, 11,000, 17,000, 21,400, 23,500, 25,000, 25,200, 26,300, 26,400, 27,000, 29,860, 31,700 to 32,160 years B.P.<sup>555</sup>

These dates becoming older with depth were just what was later found at Meadowcroft rockshelter Pennsylvania which was generally accepted by many establishment types. But a date of 32,000 years simply could not be accommodated into the chronology of these conservatives and it was again rejected. Jared Diamond, writing a year after these finds were published, simply denied the evidence that contradicted his and his colleague's theoretical system thus:

" . . . at excavated Clovis sites, conclusive evidence for artifacts made by other people has been found above, but not below the level of Clovis tools; and there are no irrefutable human remains with irrefutable pre-Clovis dates anywhere in the New World south of the former Canadian ice sheet. Mind you, there are dozens of claims of sites with pre-Clovis human evidence, but all are marred by serious questions about whether the material used for radiocarbon dating was contaminated by older carbon, or whether the dated material was really associated with human remains, or whether the tools supposedly made by hand were just naturally shaped rocks. In contrast, the evidence for Clovis is undeniable, widely distributed and accepted by archaeologists."<sup>556</sup>

The last sentence, I suggest, should read "In contrast, the evidence that supports my theory and that of my conservative colleagues for Clovis, cannot be other than undeniable, even though the evidence from dozens of other sites is just as widely distributed as our evidence; but our evidence is accepted by archaeologists with the same outlook as mine, and I with theirs, but not with the evidence that contradicts what we have labored so long and hard to prove." Just as with the radiocarbon data from Thailand, if the radiocarbon evidence supports the conservative position, it is good, unquestionable, and acceptable, but if radiocarbon data contradicts the established conservative position, it is bad, questionable, and unacceptable.

Now, since the 12,000 year barricade has fallen, will the great destruction of the radiocarbon evidence by the conservative scholars be reexamined by them in the light of the new paradigm? Of course not; they, like so many others before them, will go to their graves in an abject state of denial that all the evidence that goes against their theory is valid.

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<sup>555</sup>N. Guidon, G. Delibrias, "Carbon-14 dates point to man in the Americas 32,000 years ago," *Nature*, Vol. 321, (1986), pp. 769-771.

<sup>556</sup>Jared Diamond, *Discover*, (June 1987), pp. 84, 86.

In this respect, Colinvaux admitted that in his own research he rejected over thirty percent of the radiocarbon dates he knew of in order to "erect a chronology which is compatible with the known late Pleistocene and recent."<sup>557</sup>

T. W. Stafford, *et al.*, state: "Bone is not usually recommended for 14C dating . . . because its 14C age is either discordant with associated charcoal dates, or ages from different fractions of the bone are discordant with each other."<sup>558</sup> This will quickly become apparent, just as Wescott said.

It is the position of this writer that radiocarbon dating has a major flaw which will be exposed below which will generate extremely old ages for trees, mammoths and all the biota that lived on Earth during the great warm period—the hipsithermal. With this in mind, let us turn to the first question raised: How accurate is this radiocarbon dating method and has the data been culled or abused to support the established theory rather than to test it? With respect to the problem of accuracy of radiocarbon dating, Schultz frankly admits:

". . . radiometric dating techniques, nor any other, can supply dates that are acceptable at face value. Every date needs verification by other means, and then it still carries a question mark. Radiometric dates are always stated with a plus-or-minus number of years to allow for statistical error. The test processes are complicated and tedious, and human error is an ever-present possibility. . . . In radiometric dating, for instance: An unearthed fragment of bone or wood did not lie in a sealed box all through the years. Soil, organisms, roots, and other matter that could affect the dating have been in contact with it; ground water has dissolved and carried away material that should figure in the measuring and brought to that spot material from elsewhere. Just a speck of contaminant throws the computed date off."<sup>559</sup>

To add to these reservations, Schultz cites William T. Pecora and Meyer Rubin of the U. S. Geological Survey in their "Absolute Dating and the History of Man."

"Our crying need for absolute dating of geologic events of materials has spurred such massive efforts by geophysicists during the past two decades that the activity along the path has raised, on the one hand, a host of geologic believers whose hope and faith are so frenetic that they have become uncritical, and on the other, a host of geologic doubters who refuse to accept the probability that many gems lie within the handful of 'number' grains offered them.

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<sup>557</sup>Paul A. Colinvaux, "The environment of the Bering land bridge," *Ecological Monographs*, Vol. 34, (1964), p. 314.

<sup>558</sup>T. W. Stafford, *et al.*, "Study of bone radiocarbon dating accuracy, . . ." *Radiocarbon*, Vol. 29, (1987), p. 24.

<sup>559</sup>Gwen Schultz, *Ice Age Lost*, *op. cit.*, p. 28.

" . . . All applicable dating methods and all possible materials are being used. This shotgun approach is not thoroughly satisfactory but is recognized as part of the evolution of science. THE POSSIBILITY THAT ALL METHODS USED TODAY ARE WRONG MUST BE ACKNOWLEDGED."<sup>560</sup>

(Capitalization added)

Elsewhere I have pointed out several major problems and fundamental contradictions in radiocarbon and other dating methods.<sup>561</sup>

What I pointed out in that article is that radiocarbon was put to a basic test and failed, on a massive scale, to show itself to be what the true believers suggest it is. Briefly, "Britain's Science and Engineering Research Council . . . commissioned a trial that compared the accuracy with which 38 [radiocarbon] laboratories around the world dated artifacts of known age. Of the 38, only seven produced results the organizers considered satisfactory."<sup>562</sup> The facts are that none of the laboratories got the exact date, while 31 of the 38 of the world's leading radiocarbon testing facilities were in error, some by many hundreds to thousands of years, even with plus and minus limits added to their dates. That is, only 18.5 percent gave results near enough to be accepted, while 81.5 percent were dead wrong. For those who advocate such a method I ask: What is the basis of their confidence, given this recent overwhelming categorical failure to pass such a basic test?

Schultz has raised the issue of contamination of materials to be dated from "soil, organisms, roots, and other matter," which can bring "to that spot material from elsewhere." In fact, when Velikovskiy had short-lived materials radiocarbon dated from Egypt, and the dates were far too young in terms of the established historical chronology, it was then argued that they had been contaminated. I wish to show that several dates for mammoth remains are indisputably contaminated, but are not rejected as good evidence. According to Guthrie, the dating of the baby mammoth, Dima, found in the old Soviet Union and presently displayed at the zoological Museum in St. Petersburg, gave

"[r]adiocarbon dating [which] showed that wood found immediately around the carcass had been buried from 9,000 to 10,000 years B.P. However, a number of Soviet laboratory tests on the mummy's tissue gave dates in the range

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<sup>560</sup>*Ibid.*, p. 29.

<sup>561</sup>Charles Ginenthal, "Scientific Dating Methods in Ruins," *The Velikovskian*, Vol. II, No. 1, (1994).

<sup>562</sup>Andy Coghlan, "Unexpected errors affect dating techniques," *New Scientist*, (September 30, 1989), p. 26.

of 40,000 years B.P. One tissue sample submitted to a lab in Pittsburgh, Pennsylvania, gave a date of 26,000."<sup>563</sup>

Here we have the tissues of a mammoth giving dates of 40,000 and 26,000 years. Clearly there is contamination or error or both here which cannot be denied for both samples since the wood around the carcass showed a date from 9,000 to 10,000 years B.P. Guthrie also shows a mammoth mummy discovered in 1977-78 in Siberia gave radiocarbon dates of 53,000 and also 45,000 years B.P.<sup>564</sup> Another found on the Shandrin River radiocarbon dated to 42,000 and 32,000 years B.P.<sup>565</sup>

Naturally one may argue this proof of contamination gives no credence to Velikovsky since all these dates fall well before Velikovsky's cataclysm. This was the point Walter Sullivan of *The New York Times* took when he argued that radiocarbon dates of the mammoths are fairly uniformly spread through the last 20,000 years. "There is no hint of one or two cataclysmic events . . . and all ages are far greater than proposed by Velikovsky."<sup>566</sup> Dwardu Cardona has also posed this same problem in *KRONOS*. "Here is where the problem lies."

"Radiocarbon dating of the Siberian mammoths does *not* confirm extermination in the eighth/seventh century B.C. Nor does it corroborate annihilation in or anywhere around 1,500 B.C. Even if we were to bring into the picture Velikovsky's earliest catastrophe of the Deluge, which he dates at 'between five and ten thousand years ago,' the Siberian mammoths, according to radiocarbon dating would still be too old."<sup>567</sup>

What neither Sullivan nor Cardona could know at the time they wrote was that the varve chronology denied the validity of most all of the radiocarbon dates they cited. Cardona, adds, "The thing to do, of course, is to await further tests. But meanwhile, and with the little evidence we have at hand, the problem cannot thus be resolved."<sup>568</sup> It can only be resolved if there are a number of radiocarbon dates well into the hypsithermal. For example, the fat and blood tissues from the famous Beresovka mammoth in Siberia

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<sup>563</sup>Guthrie, *Frozen Fauna, op. cit.*, pp. 9-10.

<sup>564</sup>*Ibid.*, p. 24.

<sup>565</sup>*Ibid.*, p. 27.

<sup>566</sup>Walter Sullivan, *Continents in Motion*, (New York, 1974), p. 37.

<sup>567</sup>Dwardu Cardona, "The Problem of the Frozen Mammoths," *KRONOS*, Vol. I, No. 4 (April, 1976), p. 82.

<sup>568</sup>*Ibid.*, p. 83.

did yield a date of 39,000 years B.P.<sup>569</sup> However, the plant remains and pollen found in its stomach were dated to the hypsithermal, roughly 7,000 to 6,000 years ago.<sup>570</sup> Which dates are we to accept?

According to M. A. Tamers and F. J. Pearson, we should accept the dates of the wood and not flesh or bones. "Bone dates are generally regarded as considerably less reliable than determinations using charcoal, wood, or other materials with large carbon content (except shells). Most laboratories are in agreement that whenever possible, bone should not be used for radiocarbon dating."<sup>571</sup>

The same kind of evidence also applies to a mastodon whose bones were discovered at a farm in Tupperville, Ontario. According to Hapgood,

"The contents of the mastodon's skull consisting of humus material was dated and turned out to be  $6,230 \pm 240$  years old. . . . Therefore the reporter of the date concludes, ' . . . date which agrees with pollen diagram from site suggests nonsedimentation and exposure [to the air] of bone for about 2,500 years. . . .' In other words, the mastodon died and its bones were exposed to presumably rather cold air for 2,500 years before the bog developed over them."<sup>572</sup>

It is simply too much to ask one to believe that this mastodon's bones lay on the warm, hypsithermal surface, exposed to all the destructive, erosive elements, not only of cold, windy winters, but also of summer warmth and rain, for 2,500 years and not have been disintegrated by these elements. Thus far, what I have shown is that Beresovka mammoth in Siberia was eating vegetation that was 6,000 to 7,000 years old and that a mastodon's skull in Canada was also dated to around the same time. That is, there are dates from Siberia and North America of these elephants living well into the hypsithermal. Of course, one or two swallows do not make a summer and one may properly argue that the examples just presented cannot outweigh the innumerable others that do not fit Velikovsky's time scale.

Nevertheless, I wish to remind the reader of the Clovis police and Krishtalka's remonstrance that paleontologists will only accept selected dates that fit their model for the mammoth extinction, that he suggests they may play fast and loose with the data to make it fit the theory. The Clovis police were influential enough or threatening enough to cause researchers to withhold publishing dates that contradicted the established model.

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<sup>569</sup>Radiocarbon, Vol. 4, (1962), p. 180.

<sup>570</sup>A. Heintz, "Om pollen-analyse ay magein holdet fra Beresovka-mammuten," *Blyttia*, Vol. 16, (1958), pp. 122-142.

<sup>571</sup>M. A. Tamers, F. J. Pearson, "Validity of radiocarbon dates on bone," *Nature*, Vol. 208, (1965), p. 1053.

<sup>572</sup>Hapgood, *The Path of the Pole*, *op. cit.*, p. 139.

This I deeply regret and stress has been going on both consciously and unconsciously with this dating process for a very long time. David Wilson presented this no-holds-barred statement in 1974;

"Some archaeologists refused to accept radiocarbon dates. The attitude probably, in the early days of the new [radiocarbon] technique was summed up by Professor Jo Brew, Director of the Peabody Museum at Harvard, 'If a C14 date supports our theories, we put it in the main text. If it does not entirely contradict them, we put it in the footnote. And if it is completely 'out of date', we just drop it.'"<sup>573</sup>

This is corroborated by T. A. Thompson, *et al.*, who write:

"Relative [radiocarbon] ages are always subject to interpretation, and radiocarbon dates are often ignored or dismissed as a 'bad date' if they do not fit an *a priori* hypothesis."<sup>574</sup>

J. V. McConnell puts the case for culling, trimming, and manipulating data not deliberately, but quite directly states:

"Put more bluntly, scientists are just about as pseudo-scientific when it comes to their own behavior (in and outside of the laboratory) as crackpots are. For example, more than 30 years ago, Robert Rosenthal showed that scientists tend rather systematically to bias their laboratory observations. CSICOP often take psi [similar to ESP] researchers to task for not providing safeguards against 'experimental bias,' but I'd guess that less than 10 percent of studies in all fields of science [including radio carbon ating] include the use of similar precautions! I've seen more examples of data fudging in the lab (most of it unconscious) than I care to mention—and some of the worst instances were by a Nobel Prize laureate in chemistry. Scientists are almost as likely to impose their values and expectations on 'objective evidence' as crackpots are."<sup>575</sup>

However, Krishtalka published his views in 1984 that this pernicious practice of suppressing discordant radiocarbon dates was still operating, and the Clovis police manifesto was creating a climate of suppressed dates in the 1990's.

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<sup>573</sup>David Wilson, *The New Archaeology*, (New York, 1974), p. 97.

<sup>574</sup>T. A. Thompson, G. S. Fraser, G. Olyphant, "Establishing the altitude and age of past lake levels in the Great Lakes," *Geological Society of America Abstracts with Programs*, Vol. 20, No. 5, (1988), p. 392.

<sup>575</sup>J. V. McConnell, "Science and pseudoscience," *Skeptical Inquirer*, Vol. II, No. 1, (1986), pp. 104-105.

But the fact of the matter is that there are a decent number of radiocarbon dates that do not fit the 10,000 year extinction model and those inside the establishment are well aware of these, but rarely if ever mention them. These dates, in fact, fall well inside the hipsithermal. Krishtalka, in this regard, specifically reports that,

" . . . mammoths, mastodonts, peccaries, camels, llamas, ground sloths, and saber-toothed cats . . . apparently survived the human blitzkrieg 10,000 years ago . . . —their remains at some sites date to between 9,000 and 5,000 years."<sup>576</sup>

In addition, Jesse D. Jennings, in both the first and second editions of his book, *Prehistory of North America*, 1968 and 1974, presented a chart of radiocarbon dates that showed North American extinct elephants are positively dated to 6,000 B.P., and others tentatively to 4,000 B.P. Extinct horses are positively dated to 8,000 and others tentatively to 6,000 years ago. Extinct camels are positively dated to 7,000 and others tentatively to 6,000 years ago. Extinct forms of bison are positively dated to 7,500 and others tentatively to 6,500 years ago. Extinct ground sloths are positively dated to 8,000 years ago, and extinct dire wolves to 6,000 years ago.<sup>577</sup>

With respect to the ground sloths, Hibben presents additional evidence for its survival into the hipsithermal.

" . . . some Boy Scouts were investigating the crater of a small extinct volcano near Las Cruces, New Mexico. . . . Under an overhanging ledge at the bottom of the crater, they found what they considered to be the somewhat flattened remains of a large brown bear. The Scouts hoisted the carcass to the surface to examine it. They were struck by an outstanding feature. . . . This longhaired bear had claws of colossal size, so large that it was obvious that he could never have walked flat on his paws but would have had to turn the claws under and walk on the back of its paws. The animal was, of course, a giant ground sloth, one of the typical animals of the Pleistocene, which supposedly became extinct at least ten thousand years ago. The Las Cruces sloth, however, discovered by these enterprising Scouts, was in as good condition as a cow that had died last year. The dried skin, the long yellow hair, and the desiccated ligaments were all in place. Even allowing for the dryness of the southwestern air, the sloth looked as though he had tumbled down the volcanic shaft and rolled under the ledge in his death agonies only a few centuries ago, at the most.

"The sloth claw from . . . Sandia Cave [excavated elsewhere] was found on top of the cave debris rather than underneath [in] the sealing layers of . . .

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<sup>576</sup>Krishtalka, *Dinosaur Plots*, *op. cit.*, p. 206.

<sup>577</sup>Jesse D. Jennings, *Prehistory of North America*, 1 ed., (New York, 1968), p. 212; 2 ed, (New York, 1974), p. 68.

material. In certain areas, at least, it would appear that the giant ground sloth lingered on long after the usually regarded end of the Pleistocene Age."<sup>578</sup>

Ceram describes these discordant radiocarbon findings thus:

"These great . . . [extinctions] were generally supposed to have taken place 'ten thousand years ago.' But this view received a death blow in 1968, when Jesse D. Jennings assembled all available radiocarbon datings of skeletal finds of animals. . . . Some, the mammoth, for example, probably survived until as late as 4,000 B.C., longer than the [American] horse. And the [extinct] *Bison Antiquus*, was still roaming the prairies. . . ."<sup>579</sup>

According to Edwin H. Colbert, the following North American mammals—ground sloth, glyptodonts, mastodons, horse, camel, extinct pronghorns, and extinct musk oxen lived beyond the 10,000 year date well into the hipsithermal.<sup>580</sup> He goes on to claim the "giant wombat known as 'diprotodonts'—as large as grizzly bears—inhabited Australia in subrecent times evidently becoming extinct only a few thousand years ago. And with them were giant kangaroos also no longer living."<sup>581</sup>

In combination, Krishtalka, Colbert, and Jennings' lists of extinct animals that lived into the hipsithermal contain giant wombats, giant red and gray kangaroos, mammoths, mastodons, peccaries, camels, musk-oxen, llamas, ground sloths, pronghorned deer, saber-toothed cats, horses, extinct bison, and dire wolves, while Flannery and Gillespie showed that giant, extinct marsupials and megafauna in Australia date to 6,000 years ago.

Now one of the animals dated into the hipsithermal period is the American Camel, *Camelops*, but there is basic evidence that this mammal did live beyond the Pleistocene. This was brought about by the

". . . discovery in Utah of the unfossilized skull of an extinct camel, with a bit of dried flesh still clinging to the bone. The relatively fresh condition of the specimen argues that its one-time possessor died only a few centuries or millennia ago; present ideas hold that this particular sort of camel did become extinct a half-million years ago. If this camel really died so long ago, the bone

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<sup>578</sup>Hibben, *The Lost Americans*, *op. cit.*, pp. 160-161.

<sup>579</sup>C. W. Ceram, *The First Americans*, *op. cit.*, p. 269.

<sup>580</sup>Edwin H. Colbert, *Wandering Land and Animals*, (New York, 1973), chart, p. 280.

<sup>581</sup>*Ibid.*

should have been largely or wholly replaced by stone, and there should have been no flesh on it all."<sup>582</sup>

These were not the imported camels discussed earlier. Professor Alfred S. Romer of the University of Chicago who examined the skull claimed the anatomical differences between American and African or Asian camels made it clear that this skull belonged "to the genus *Camelops*."<sup>583</sup>

This is corroborated by Hibben:

"In New Mexico, in a cave, there was discovered in the late 1930s . . . evidence of lingering [survival] of certain Pleistocene animals. This cave, located in the Guadalupe Mountains near the Texas line, is a narrow cleft-like crack in the limestone . . . . The entrance is low and narrow, making it necessary for the investigator to crawl on hands and knees for several feet. Inside, however, the cave opens into a large chamber with a floor several feet below the level of the entrance passageway. The large, sunken room is almost filled with camel bones. These camels are not the present-day circus variety, but rather the small, long-necked American camels of the Pleistocene period. The bones lie in profusion, perfectly preserved as though they had piled there only a few years ago. The cave is redolent with the odor of dry dust and of the bats that hang in clusters from the ceiling. But even the extreme aridity could hardly account for the wonderful preservation of the camel remains. There is little or no accumulation on top of them. In the Abilene region of Texas, accumulations of silts on top of ancient deposits gave an indication of their comparative age. In Camel Cave, only a thin veneer of dust and bat guano covers the camel graveyard. They do not seem to be extremely ancient. From this evidence, as well as from similar signs in Gypsum Cave in Nevada [to be discussed just below], it would seem that the American camel lingered on after death had overtaken the majority of its Pleistocene contemporaries."<sup>584</sup>

Thus, not only does radiocarbon date the American camel into the hypsithermal, but so, too, does paleontological evidence.

A major problem related to the extinction is to be found in Gypsum and Etna Caves in Nevada. Human artifacts and dung of an extinct species of American horse were found associated. Marie Wormington presented this evidence in 1957 in *Ancient Man in North America*. The problem is that this fossil material would have been flooded and submerged well beneath the waters of Lakes Bonneville and Lahonton, all during the last Ice Age. Therefore, it is clear that neither manufactured artifacts such as sandals and

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<sup>582</sup>*Science Newsletter*, Vol. 14, (1928), p. 81.

<sup>583</sup>*Ibid.*

<sup>584</sup>Hibben, *The Lost Americans*, *op. cit.*, p. 161.

twig effigies and extinct horses could only have existed in these caves until well after the Ice Age ended and the waters subsided or evaporated away. Wormington admits "there is no indication that the caves were ever inundated after occupation had begun."<sup>585</sup>

Unquestionably, the horse used the cave in the post-glacial period and had survived in the Great Basin into recent times. This evidence is yet another quandary that contradicts the established date of the extinction. If the horse lived in caves prior to the Ice Age, the water would have destroyed its dung, ergo, it had to live in the Great Basin for a considerable time to allow these tremendous lakes to subside and then entered. This is yet another enigma rarely discussed in modern literature because the evidence violates the 10,000 year extinction barrier.

What, then, of the horse in Europe as related to the mammoth? Domestication of the horse begins about 4,000 B.C. or 6,000 years ago. Therefore, finding a carving of a horse with a halter carved from mammoth ivory could not occur. Yet Caras reports on

". . . a small ivory carving of a horse's head found in the Saint Michel d'Arudy cave in the Pyrenees. The horse appears to be wearing a rope halter. The piece is carved from mammoth ivory and comes from the Paleolithic, the Old Stone Age, fourteen thousand years ago. That is very much earlier than the traditional time given for horse domestication. . . .

"By 4,000 B.C., there is evidence of horses in the company of man. That is eight thousand years after the mysterious mammoth ivory carving found in the cave in the Pyrenees. . . . A discrepancy of nearly eight thousand years is too difficult to explain."<sup>586</sup>

But there is no discrepancy if the mammoth and horse were contemporary with each other during the hipsithermal, and man was domesticating the horse while the mammoth still thrived. In America, as in Europe, the evidence of the horse points to an extinction episode at the end of the hipsithermal.

However, in connection with dated humans in the Americas, Jennings discusses the Cochise people of southeastern Arizona, stating that they were radiocarbon-dated at over 8,000 B.P.<sup>587</sup> But then he adds, the stunning fact that these people who lived in the hipsithermal have their artifacts found in "apparent association with extinct fauna—horse, mammoth, dire wolf—as well as with modern bison, antelope, and coyote. While some have questioned the contemporaneity of the artifacts and the bones of extinct creatures,

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<sup>585</sup>Terrell, *American Indian Almanac*, *op. cit.*, p. 376.

<sup>586</sup>Caras, *A Perfect Harmony*, *op. cit.*, pp. 145-146.

<sup>587</sup>Jennings, *Prehistory of North America*, *op. cit.*, p. 172.

the association appears valid."<sup>588</sup> Here we have clear evidence of a post glacial culture found with the remains of horse, mammoth, and dire wolf.

With regard to the extinction in and around the Great Basin, Grayson showed that the noble marten, thought to have become extinct at the end of the Pleistocene lived in the west in southwestern Idaho up until about 3300 years ago, in the Great Basin to about 3,600 years ago and in the Ruby Mountains to about 3,500 and 1,200 years ago.<sup>589</sup> As to why this animal survived to this time instead of being hunted to extinction or destroyed by climatic change, he admits "there is as of yet no answer."<sup>590</sup>

About a century ago, Howorth pointed out,

"In 1828, Tournal, who was in charge of the museum at Narbonne, published in the fifteenth volume of 'Annales des Sciences Naturelles,' p. 348, the discovery of human bones and pottery with the remains of extinct animals in the cave of Bize (Aude), and M. Marcel de Serres declared the human bones to be in the same mineral condition as those of the associated mammals.

"The reported presence of pottery, however, as Sir John Lubbock and M. Mortillet suggest, qualifies the value of the evidence, since the pottery was no doubt of a later date, but the doubt only rests with the care of the explorers. The following year, M. Christol, in a memoir on human remains from the caverns of the Gard, published his discovery of human bones mixed with those of the hyaena and rhinoceros in a cavern near Poudres. This cavern also contained pottery. Similar discoveries were made by M. Emilien Dumas, in the cave of Souvignargues near Sommieres (Gard), and by Doctor Pitore at Fauzen, near Cessero (Herault)."<sup>591</sup>

But those who are familiar with Velikovsky's *Earth In Upheaval* will remember he pointed out that on the Atlantic coast at Vero, Florida, human remains and artifacts were unearthed, mixed together with extinct, Ice Age animals, such as saber-toothed cats and camels.

"Beside the human bones pottery was found, as well as bone implements and worked stone. Ales Hrdlicka . . . wrote that the 'advanced state of culture, such as that shown by the pottery, bone implements, and worked stone brought from a considerable distance, implies a numerous population spread over large areas, acquainted thoroughly with fire, with cooking food, and with all the usual primitive arts'; the human remains and relics could not be of an antiquity 'comparable with that of fossil remains with which they are associated.' He also

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<sup>588</sup>*Ibid.*

<sup>589</sup>Grayson, *The Great Basin, op. cit.*, p. 226.

<sup>590</sup>*Ibid.*

<sup>591</sup>Howorth, *The Mammoth and the Flood, op. cit.*, p. 229.

published the opinion of W. H. Holmes . . . who investigated the pottery. . . . These were bowls 'such as were in common use among the Indian tribes of Florida.' When compared with vessels from Florida earth mounds, 'no significant distinction can be made; in material thickness of walls, finish of rims, surface finish, color, state of preservation, and size and shape,' the vessels 'are identical.' There thus appears 'not the least ground in the evidence of the specimens themselves for the assumption that the Vero pottery pertains to any other people than the mound-building Indian tribes of Florida of the pre-Columbian time.'

"But the bones of man and his artifacts . . . were found among the extinct animals. The discoverer of the Vero deposits, E. H. Sellards . . . a very capable paleontologist wrote in the debate that ensued: 'That the human bones are fossils normal to this stratum and contemporaneous with the associated vertebrates is determined by their place in the formation, their manner of occurrence, their intimate relation to the bones of other animals, and the degree of mineralization of the bones.' This 'degree of mineralization of the human bones is identical with that of the associated bones of the other animals.'<sup>592</sup>

This evidence again indicates that these Ice Age mammals did indeed live well into historical times. But then Velikovsky goes on to show:

"In 1923-29, thirty miles north of Vero, in Melbourne, Florida, another such association of human remains and extinct animals was found, 'a remarkable rich assemblage of animal bones, many of which represent species which became extinct at or after the close of the Pleistocene . . . epoch.' The discoverer, J. W. Gidley . . . established unequivocally that in Melbourne—as in Vero—the human bones were in the same stratum and in the same state of fossilization as the bones of the extinct animals. And again human artifacts were found with the bones. The 'projectile points, awls, and pins' found with the human bones at Melbourne as well as at Vero are of the same workmanship as those unearthed in early Indian sites, two thousand of which are known in the area.

"All these and other considerations of an anthropological, as well as geological nature, being summed up prove, in the opinion of I. Rouse, a recent analyst of the much-debated fossils of Florida, that 'the Vero and Melbourne man should have been in existence between 2,000 B.C. [4,000 years ago] and the year zero A.D.' . . .

"There is no proper way out of this dilemma, other than the assumption that now extinct animals still existed in historical times . . ."<sup>593</sup>

According to H. M. Wormington,

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<sup>592</sup>Immanuel Velikovsky, "Fossils in Florida," *Earth In Upheaval*, (New York, 1955), pp. 167-168.

<sup>593</sup>*Ibid.*, pp. 168-169.

"James W. Gidley and Frederick B. Loomis (1926),<sup>594</sup> accepted the contemporaneity of the men and the extinct animals here [at Vero] and near Melbourne, Florida, *but they suggested that the animals had not become extinct until after the end of the Pleistocene.*"<sup>595</sup> (Emphasis added)

We have earlier discussed the fact that mammoths were supposedly driven to extinction in China 18,000 years ago. But in 1926, a Chinese scholar named H. T. Chang, re-examined ancient Chinese texts which contained notations that indicated rhinoceroses and elephants were still alive in northern China up and into historical times. Further investigation led Chang to discover that after the elephant became extinct in northern China, it continued on in the south. But of greatest significance was the finding of many reliable reports that rhinoceroses were still quite common in Hunan up until 1,263 A.D. and that there were wild elephants in Kwang-Tung and Kwang-Si.<sup>596</sup> Thus, how can radiocarbon dating which suggests an 18,000 year extinction of mammoths be correct? What killed off the mammoth in northern China should have killed off the elephant and rhinoceros, as well.

Here it is made abundantly clear that there are apparently various measurements and associations for a variety of extinct animals that date directly to the hypsithermal, but because of the establishment's control, this evidence has been swept under the rug. I further submit that exactly the opposite would be the case if the establishment's dogma coincided with a late hypsithermal extinction.

As was pointed out quite directly by R. E. Lee, the dates derived by radiocarbon "are actually SELECTED DATES."<sup>597</sup> (Capitalization added) Although some of these dates are based on bone collagen which is easily contaminated, not all are and the dates of many extinct mammals are also accepted as properly dated based on using this same material.

But what then of wood which is not bone collagen? Paul S. Martin earlier showed that "in Alaskan muck . . . the dates, on wood associated with the bones [of extinct species] appear much too young."<sup>598</sup> Doesn't this material strongly indicate that the extinctions in Alaska were much closer to the present than heretofore believed? In "Big Bone Lick, Kentucky, one of the richest late-Pleistocene deposits in eastern North

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<sup>594</sup>"Fossil Man in Florida," *American Journal of Science*, 5th series, Vol. 12, (Sept.), pp. 254-265.

<sup>595</sup>H. M. Wormington, *Ancient Man in North America*, (Denver, Colo., 1957), pp. 227.

<sup>596</sup>H. T. Chang, "On the Question of the existence of elephants and rhinoceros in North China in historical times," *Bulletin of the Geological Society of China*, Vol. 5, (Peking, 1926), pp. 99-105.

<sup>597</sup>R. E. Lee, "Radiocarbon Ages in Error," *Anthropological Journal of Canada*, (1981) 19 (3):9, p. 27.

<sup>598</sup>Deloria, *Red Earth White Lies*, *op. cit.*, p. 119.

America, [according to Martin] two samples of wood initially thought to be associated with bones of extinct species proved modern."<sup>599</sup>

According to Owen-Smith, "Dwarf elephants (*Elephas falconeri*) standing only a meter high at the shoulder . . . survived in Sicily and other Mediterranean islands until as recently as 8,000 years B.P."<sup>600</sup> If this was the case, then there would be no way that the Egyptians could have known of these mammoths. Nevertheless, Baruch Rosen in a letter accompanied by a photograph, shows a tusked dwarf mammoth that was painted on the tomb of an ancient Egyptian pharaoh in *Science*.

"The figure [of the mammoth], reproduced from a scene painted in a pharonic tomb . . . raises the possibility that the elephantid represents a dwarf mammoth. . . .

"This picture demonstrates the artist's ability to draw a creature alien to him. . . .

"The elephantid depicted here is not an immature elephant because of its large [long] tusks. Its skull is domed similar to a mammoth or possibly an Asiatic elephant. Its stance and the position of the tusks and trunk is more like a reconstruction of a living mammoth than an immature elephant. The beast is unrelated to the modern mini-elephant reported from central Africa. It looks different, and no direct contact (transport of live animals) between that part of Africa and ancient Egypt has ever been documented."<sup>601</sup>

Now how is it possible that after these mammoths became extinct 8,000 years ago, Egyptian artists would be able to render them accurately with hair and head bulge common to these creatures? What this clearly indicates is that these mammoths did not become extinct 8,000 years ago, but that they lived well into historical times so that they could be observed and drawn accurately. A comparison of the drawing from ancient Egypt and page 35 of Lister's book, *Mammoths*, will make it clear that the dwarf was indeed a mammoth.

Tudge discussed this remarkable Egyptian picture found in a tomb in ancient Egypt. ". . . there is a picture on a wall of a pharonic tomb that looks remarkably like a dwarf mammoth. There is no good reason to doubt that it is."<sup>602</sup> Although the usual uniformitarian interpretations are presented to debunk this depiction, Lister remarks that other dwarfed mammoths or elephants also appear to be "hairy" and "tusked."<sup>603</sup> Now why would the Egyptians paint an elephant covered with hair if they had never seen one?

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<sup>599</sup>*Ibid.*, p. 120.

<sup>600</sup>Owen-Smith, *Megaherbivores*, *op. cit.*, p. 281.

<sup>601</sup>Baruch Rosen, "Mammoths in ancient Egypt?" *Nature*, Vol. 369, (June 2, 1994), p. 364.

<sup>602</sup>C. Tudge, *The Time Before History*, *op. cit.*, p. 59.

<sup>603</sup>Lister, Bahn, *Mammoths*, *op. cit.*, p. 137.

If that was a stylized depiction, then wouldn't there be hairy hippos, rhinos, and crocks drawn the same way? I strongly doubt that such is ever the case. Even Lister cautions that one keep an "open mind" on this matter of the dating of the extinction.<sup>604</sup> In fact, Ward now admits the Mediterranean "dwarf elephants date to only 5,000 years ago, long after the end of the Ice Age."<sup>605</sup> Tudge further claims of the dwarf elephants of the islands of the Mediterranean, "the youngest of the known dwarf elephants disappeared on Tilos [Island] around 4,500 years ago, the time of the earliest pyramids."<sup>606</sup>

Related to the extinct dwarf mammoths is that of the extinct giraffe or Swatherium. It was a large bodied ox-like giraffe with two great, flaring, bony horns on the back of the skull, and two smaller, conical horns in front above the eyes. It, too, supposedly became extinct at the end of the Pleistocene. However, according to Colbert, it was represented by a "little bronze figure made by an ancient Sumerian several thousand years ago. . . ."<sup>607</sup>

Now how could a bronze age artist create a figure of an animal with extraordinary sets of horns on its head if he had never seen one? Again, as with the dwarfed mammoth, it seems that these animals lived well into historical times.

In another context Colbert, like Romer, who showed that ancient, extinct camels lived well into the hypsithermal, discusses the mummified remains of extinct, giant ground sloths claiming that "the discovery of partial mummies of these giant edentates, with patches of skin and hair intact, is an indication of the fact that the ground sloths probably persisted to within the last few thousand years."<sup>608</sup>

It is well-known, as I pointed out in my book, *Carl Sagan and Immanuel Velikovsky*, that in Central America there are various depictions of elephants by the Maya and other peoples. However, Kurten shows that the same kind of evidence exists in South America.

"In the 1920's the German archaeologist K. T. Preuss discovered a remarkable stele in the highlands of Columbia. About ten feet tall, it shows a man carrying on his head a human figure with an animal head. That head has curved tusks, sticking out each side of a short trunk. Could it be the head of a mastodon?

"Professor Ernst Stromer, the Munich paleontologist, did not exclude the possibility. Other suggestions range from pig (but there were no pigs in America

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<sup>604</sup>*Ibid.*

<sup>605</sup>Ward, *Call of Distant Mammoths*, *op. cit.*, p. 196.

<sup>606</sup>Tudge, *The Time Before History*, *op. cit.* p. 293.

<sup>607</sup>Edwin H. Colbert, *Evolution of the Vertebrates*, 2 ed., (New York, 1969), p. 438.

<sup>608</sup>*Ibid.*, p. 295.

in pre-Columbian days) to coatimundi, but the nose of the coati is not widened at the end like the figure, and of course this little carnivore does not have tusks."<sup>609</sup>

It also exhibits one large ear feature (the other having been broken off of the stele), which is also indicative of an elephant. Again, one must ask, why would the ancient people of the highlands of Columbia in South America carve into stone the features of an elephant if they never saw one, which is the same question I asked of the mammoth drawn by the Egyptians. According to Willard Barcom, a representation of an elephant figurine was discovered in Costa Rica near San Jose. It could only be an elephant of some kind since it exhibited the clear delineation of a trunk, head bumps, large ears and heavy legs with four toes.<sup>610</sup> This figurine comes from the period when people of Central America had learned to fire clay which again suggests a time well after the Ice Age ended.

From Quito, Ecuador comes other fundamental evidence that mastodons lived well past the 10,000 year limit, as outlined by Goodman:

" . . . the earliest known pottery in the New World comes from Ecuador and the Caribbean and is only 6,000 years old . . . a . . . paper by Max Uhle, the father of Peruvian archaeology . . . [was] Given (in German) in 1928 at the Twenty-Third International Congress of the Americas, Uhle's paper reported on the finding of an extinct mastodon associated with pottery. The skeleton was found buried near Quito, Ecuador, by Professor Franz Spellman of the University of Quito . . . Obsidian flakes, a bone point, and about one hundred and fifty potsherds were found around the bones."<sup>611</sup>

George F. Carter, with respect to the age of the potsherds, adds:

"This places the kill within the pottery period of that area and a very early date would be 3,000 B.C. Since some of the pottery was said to be decorated, a later date is quite possible."<sup>612</sup>

According to Niede Guidan, of the French Institute of Advanced Social Studies, who worked in Brazil at Pedra Furada, the rock art in the region included "giant sloths,

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<sup>609</sup>Björn Kurten, *Before the Indians*, *op. cit.*, p. 122.

<sup>610</sup>Willard Barcom, "The Earliest Voyages," *The Ocean in Human Affairs* (New York, 1990), p. 310.

<sup>611</sup>Goodman, *American Genesis*, *op. cit.*, p. 222.

<sup>612</sup>George F. Carter, "A Note On The Elephant In America," *Epigraphic Society Occasional Publications*, Vol. 18, (1989), p. 90.

horses, an early type of llama and . . . camels. . . . This phase lasted till about 5,000 years ago. . . ."<sup>613</sup>

Sanderson further points out stelas discovered in Copan, Central America, with unmistakable depictions of elephants on them:

"The two top and dominant figures on each edge of one stele are most perfectly and naturalistically represented heads of elephants. . . . One of these figures carries on its neck a mahout wearing a typical oriental turban on his head and holding in his hand a traditional square elephant hook.

". . . [These] drawings . . . blew up a storm of speculation, controversy and acrimony which lasted eighty years. . . .

"To summarize the arguments we may say that because elephants in ancient Central America did not then and still do not fit into the prescribed scheme of history, but because these carvings were undeniably authentic, everything possible and impossible was immediately put forward to 'explain them away'. . . .

"What clinched the matter, however, was a careful search for and reappraisal of the extant original Mayan Codices—hieroglyphic texts on scrolls. . . . Brought to light were several dozen quite obvious elephant symbols, . . ."<sup>614</sup>

It has been suggested that ancient travelers from India brought the information to ancient Mayan culture which then represented the elephant. But somehow no depictions of water buffalo or the peacocks, were brought from India. And since Chang showed rhinos survived in Asia well into historical times, why weren't they depicted?

Furthermore, in *Science Digest*, are carvings from the American southwest called Elephant slabs dated to 1,200 A.D. with clear depictions of elephants. The carvings closely resemble the kind of workmanship of that time and place.<sup>615</sup>

All the mammoth, mastodon, or other extinct animals depicted by man or found with post-Ice Age artifacts of man have been ignored or called fraudulent and the researchers who presented them were attacked. None of this behavior is that of objective science, but that is what we have encountered from the outset.

Lewin discusses one such supposed hoax known as the Holly Oak pendant discovered by H. Y. Cresson and W. L. deSuralt in 1864 which was clearly a depiction of a mammoth.

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<sup>613</sup>Zecharia Sitchin, *When Time Began*, (New York, 1993), p. 278.

<sup>614</sup>Sanderson, *Dynasty of Abu*, *op. cit.*, pp. 125-126.

<sup>615</sup>Neill J. Harris, "The Riddle of America's Elephant Slabs," *Science Digest*, Vol. 69, (March 1971), pp. 74-77.

"The only 'hard' evidence that the pendent is a fake comes from radio-carbon dating, which suggests the shell is only  $1530 \pm 110$  years old. The authors [J. B. Griffin, *et al.*] state that since mammoths positively did not survive this recently, the pendant must be a fraud."<sup>616</sup>

However, Kurten remarks "Most investigators tend to reject it [the Holly Oak pendant] as a hoax. but recent reexamination, at the Smithsonian Institution, indicates that the carving incisions show the same stage of weathering as the shell surface itself, suggesting that the picture is genuinely old."<sup>617</sup> This suggests that about 1,500 years ago an American Indian created a hoax by incising a picture of a mammoth he had never seen onto a shell.

The reason for this is that there is now well established evidence that mammoths became extinct around 3,500 years ago. The dates came from some Russian scientists who evidently were not under the influence of such forces as the Clovis police. The evidence, like that found on the Pharaoh's tomb, indicates hairy dwarf mammoths north of Siberia evidently outlived the Ice Age and became extinct right around the time of Velikovsky's 3,500 year cataclysm. B. Bower reported this stunning fact in an article titled "Dwarf Mammoths Outlive Ice Age."

"Woolly mammoths, those icons of the Ice Age that most paleontologists assumed died out around 9,500 years ago, survived in miniature form . . . until about 4,000 years ago on an Arctic Island according to new findings. Mammoth teeth found in 1991 on Wrangel Island, located 120 miles off the coast of northeast Siberia, range from approximately 7,000 to 4,000 years old, report Andrei V. Seer and Vadim E. Garutt, paleontologists at the Russian Academy of Sciences in Moscow."<sup>618</sup>

Wrangel Island is slightly over 300 miles north of the Arctic Circle. According to *Discover*, "The tusk and bone fragments [of the Wrangel elephants] were younger, still, just 3,730 years old."<sup>619</sup> If the mammoths survived on an island in the Arctic Ocean because it was a grassland and also because they were not hunted to extinction but because the climate changed, then we are faced with a question. If Wrangel Island was a suitable habitat for mammoths, why not the great islands of Noyva Zemlya or Spitsbergen or the New Siberian Islands? These lands, too, were in the Arctic Ocean and

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<sup>616</sup>Roger Lewin, "Mammoth Fraud Exposed," *Science*, Vol. 242, (1988), p. 1246.

<sup>617</sup>Kurten, *Before the Indians*, *op. cit.*, p. 121.

<sup>618</sup>B. Bower, "Dwarf Mammoths Outlive Ice Age," *Science News*, (March 27, 1993), p. 197.

<sup>619</sup>*Discover*, (January, 1994), p. 54.

distant from the Eurasian continent and they, too, were subjected to the same climatic conditions as those on Wrangel Island. They were also far out at sea and difficult to reach by stone age hunters. It is completely incongruous to suggest that mammoths somehow survived on one Arctic Ocean island up until around 3,500 years ago for special reasons, but those on these other islands living under the same conditions and influences died out. This contradiction has also remained unanswered. Therefore, we have evidence of extinct forms of elephants from Europe and the Mediterranean islands, to Siberia's Wrangel Island, to Ecuador, and to Florida, all dated to the hypsithermal. Both dwarfed and full-sized mammoths and mastodons were alive and well after the Ice Age ended.

Grayson has made it quite clear that the "timing of the Ice Age extinctions is really very poorly understood. . . . Radiocarbon chronologies are bad in North America and worse in Europe."<sup>620</sup> This 1987 statement truly reflects the state of affairs regarding the knowledge of the age of the extinctions. One wonders how many scientists have buried similar mammoth dates as those on Wrangel Island in manila folders, in steel file cabinets, and what they were thinking as they mulled over this evidence. One wonders how many editors are thinking about papers they rejected which contained similar discrepant radiocarbon dates, and one wonders if any of this material will ever be openly reconsidered or see the published light of day. Thus, the first question raised earlier: How accurate is this dating method and has the data been culled or abused to support the established theory rather than test it, is answered in the affirmative; the data is often highly inaccurate and has undeniably been culled and abused to support established theory rather than test it. As for the second question: Are there dates of extinction of many mammals dated directly to the hypsithermal? Again, the answer is affirmative and well documented, not only in the Americas, but on Wrangel Island north of Siberia. This is corroborated by finds of mammoths and other extinct Ice Age fauna in Florida and among the Cochise people of the Great Basin, in Canada, from a mastodon's skull, as well as those dates discussed by Krishtalka, and Jennings, and others. The dates are undeniably there, but have been made invisible in the minds of the advocates of a 10,000 year B.P. Pleistocene extinction.

However, what I think should be considered as extremely important with respect to radiocarbon's message is that it should not conflict with all the other evidence regarding mammoths living in the far north, or with other geophysical evidence to be truly valid. But it clashes with this other evidence in no uncertain terms. If the date for the extinction is truly 10,000 to 12,000 years ago, then the pollen stratigraphic record should exhibit that in Siberia and Alaska, there were the proper forms of vegetation growing to support the megafauna. In complete contradiction to the 10,000 year extinction thesis, the pollen record denies the thesis that these large creatures lived in the arctic basin at that time.

The pollen stratigraphy is derived from varves in lakes in Alaska and Siberia. The varve record is a *dating record* in no uncertain terms. These layers of dark summer

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<sup>620</sup>B. Bower, *Science News*, *loc. cit.*

and light winter sediments can be counted year by year and no extrapolation is required to count them. They categorically show that during the Ice Age, the vegetation of the arctic was not the vegetation generally found in and around ancient mammoths. Therefore, what we have is that the varve chronology is in fundamental disagreement with the radiocarbon chronology. Are the uniformitarian scientists now going to say that the varve chronology is to be discarded? Are they going to suggest that only the radiocarbon chronology should be allowed as evidence? The point to stress, as we begin our analysis of radiocarbon dating, is that the varve dating record shows that mammoths did not live in the far north during the Ice Age. The varve dating record contradicts the radiocarbon record and gives basic support to Velikovsky's thesis that the mammoths lived in the arctic basin after the Ice Age ended. This is corroborated by the climate evidence that proves the arctic was as uninhabitable as a modern freezer, by the evidence that tundra foliage is toxic or unpalatable and, at best, much of it lacks the proper nutrients to support such a herbivore population year round. Thus, while the pollen record categorically denies the mammoth steppe concept, as well, the flora found in the mammoths' stomachs was undeniably shown to grow only in temperate regions. This flora did not grow in the arctic basin during the Pleistocene, but during the hypsithermal. It is impossible to suggest animals that lived in Siberia and Alaska during the Ice Age ate flora that only grew there after the end of that period. The radiocarbon data presented as cut and dry for a 10,000 year old extinction, is in basic conflict with all this evidence as well as that from solifluction lobes, preserved tusks, carcasses, and trees.

Nevertheless, I wish to explore the evidence related to the third question: Are there natural causes that would make the radiocarbon dates produced far older than the 3,500 year old date that Velikovsky posited? If it can be demonstrated that there are well understood natural processes that would come into play to change the dates and make them far older than assumed, this last pillar of support for a 10,000 year extinction crumbles. The question is, Can an overabundance of old carbon, namely C-12 and C-13, be generated during the hypsithermal and be taken in by plants and then ingested by herbivores to make the radiocarbon dates register far older than they actually are? I suggest that the evidence regarding this question is well understood and can be well explained by known natural geophysical, meteorological, and biological processes.

To wit, the more carbon 12 and carbon 13 that organisms such as wood, leaves, bone, or soft tissues take in from their environment, compared to radioactive carbon 14, makes the age of a specimen older. These atoms can be counted by an accelerator mass spectrometer and the ratio of old carbon to radioactive carbon can be determined within an error range.

The reason this ratio changes with time is due to the fact that radioactive carbon 14 breaks down into nitrogen over roughly about a 5,700 year time scale. In the first 5,700 years or so half of it becomes nitrogen and thus disappears from the sample; in the ensuing 5,700 year half-life periods it decays again and again by halves. Thus, in about 50,000 to 100,000 years there would be so little carbon 14 left in a specimen that it would be barely measurable and thus give no date, or would not be measurable unless it was contaminated by other sources of carbon 14. However, limestone, coal, and other ancient carbon-based rocks or minerals which are sources of old carbon (12 and 13) can add this

to the ground water which is taken in by plants through their roots or animals by drinking this high-carbon content water. Carbon need not be only in organic form for animals to absorb small amounts that would be turned into bone, especially calcium carbonate. An additional source of old carbon can come from volcanic eruptions which spew carbon dioxide gas made up of old carbon into the atmosphere. If this adds enough old carbon to the atmosphere, it can change the age of a plant near enough to have survived its eruption, taking in through its leaf pores or stoma the old carbon rich fumes that were vented for months by the volcano. For example, a tree growing next to an airport added so much additional old carbon to its wood tissues from airplane exhaust fumes which it had processed via photosynthesis, that when tested, its wood gave a radiocarbon date of 10,000 years.<sup>621</sup> Any animal that ate the foliage of that tree or the grasses growing in the vicinity, subject to the same conditions, would absorb that old carbon in far greater proportions than carbon 14 and its radiocarbon age would appear much older than it actually was. If such an animal grazed continuously on such vegetation all its life, then its radiocarbon age would become extraordinarily old compared to its true age. The intake of old carbon can affect radiocarbon dating to generate dates that are inordinately old.

Velikovsky specifically discussed this problem known as the Suess Effect caused by old carbon in 1973:

"But as the method [of radiocarbon dating] was refined, it started to show rather regular anomalies. First, it was noticed that, when radiocarbon dated, wood grown in the 20th century appears more ancient than wood grown in the 19th century. Suess explained the phenomenon by the fact that the increased industrial use of fossil carbon in coal and in oil changed the ratio between dead carbon C-12 and the C-14 (radiocarbon) in the atmosphere and therefore also in the biosphere. In centuries to come a body of a man or animal who lived and died in the 20th century would appear paradoxically of greater age since death than the body of a man or animal of the 19th century, and if the process of industrial use of fossil, therefore dead, carbon continues to increase, as it is expected will be the case, the paradox will continue into the forthcoming centuries."<sup>622</sup>

But what if even a great deal more dead carbon was dumped into the atmosphere than that evidenced since the Industrial Revolution, what would then occur? This will be dealt with below to show that this is just what had to happen during the period of great, post-glacial warmth.

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<sup>621</sup>Bruno Huber, "Recording Gaseous Exchange Under Field Conditions," *The Physiology of Forest Trees*, K. V. Thinmann ed., (New York, 1958) p. 194.

<sup>622</sup>Immanuel Velikovsky, "The Pitfalls of Radiocarbon dating," *Pensée, op. cit.*, p. 12.

However, the other way of delivering old carbon to plants is via the ground water from areas with limestone or other carbonate minerals that can also have a profound affect on the radiocarbon age of plants and also of animals. If ground water is saturated with old carbon, it can drastically change the age of a plant. And this has been known from almost the inception of the radiocarbon dating process in the 1950's. J. Gordon Ogden, III describes how radiocarbon in lakes from run-off and ground water becomes contaminated with old carbon.

"The dilution of atmospheric carbon 14 by waters rich in Paleozoic limestone constitutes a major problem in dating sedimentary sequences from lake basins . . . Broecker and Walter (1959) have shown that dissolved carbonate minerals can result [add old carbon] in surface material with as little as 50% of modern carbon 14 activity. Living aquatic plants from Montezuma Well in Arizona show a carbon 14 activity corresponding to an average of 17,300 and 24,750 [years] respectively."<sup>623</sup>

If mammoths took in this material regularly, they would have radiocarbon dates that are also many more thousands of years older than their actual ages. If they drank water from such a source, it would also affect its age. In Lake Baikal live flatworms and sponges were radiocarbon dated near to a deep thermal vent degassing old carbon. The apparent ages of these organisms based on radiocarbon testing were from 6,860 to 10,200 years.<sup>624</sup> Had these organisms lived during the hipsithermal and perished and their remains frozen and preserved somehow, they would radiocarbon date anywhere from about 9,500 to 14,200 years (provided they took in no additional old carbon). They would be about the same age as many of the extinct mammoths. Any carnivorous organism ingesting these organisms would also appear to be much older.

Not only do water plants absorb carbon, but ground plants can also do the same through their root systems. We are specifically informed on this matter that "microscopic tubes (root hairs) . . . aid in anchoring the root and in absorbing the surface films of water and dissolved minerals from soil particles."<sup>625</sup> We are further informed "The plant obtains *carbon*, hydrogen and oxygen from water; *carbon dioxide* and other nutrients are taken up from the soil."<sup>626</sup> (Emphasis added)

In addition,

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<sup>623</sup>J. Gordon Ogden, III, "Radiocarbon and Pollen Evidence for a Sudden Change in Climate in the Great Lakes Region approximately 10,000 years go," *Quaternary Paleoecology*, E. J. Cushing, H. E. Wright, Jr., eds. (New Haven, CT, 1967) p. 119.

<sup>624</sup>M. Grachev, *et al.*, "Extant Fauna of Ancient Carbon," *Nature*, Vol. 374, (1995), p. 123.

<sup>625</sup>*Encyclopedia Britannica, Macropedia*, Vol. 9, (Chicago, 1982), p. 666.

<sup>626</sup>*Ibid.*, Vol. 1, p. 350.

"The most rapid changes in fresh water composition generally occur between the surface and the water table . . . within the unsaturated zone [the soil above the water table] the changes in fresh water composition are caused by leaching of the minerals present. . . . In water under grasslands, the concentration of carbon dioxide is approximately 1,000 times that of water in equilibrium with air . . . Forests commonly increase the carbon dioxide content of soil and ground water 100 times above the content of rain water, and even the sparse vegetation of deserts adds two to ten times the CO<sub>2</sub> found in rain."<sup>627</sup>

And finally on this matter, "High amounts of dissolved carbon dioxide in water produce high plant productivity."<sup>628</sup> What all this means is that carbon dioxide is added to rain water from organic and inorganic sources in the soil. This does not mean that the soil will contain only old carbon. The rain falling on it and the plants decomposing in it, as well as aeration in it, is constantly renewing the supply of young, radioactive carbon 14. The ground itself must contain a great deal of additional old carbon well above these other sources to significantly change this carbon 14 to carbon 12-13 ratio. Thus, plants and animals in a locality with an imbalanced ratio of young to old carbon in its soil and ground water, will create specimens that are older than they actually date by radiocarbon testing. J. G. Ogden III, director of a radiocarbon dating laboratory, pointed out in 1977 that a fundamental problem with this dating method is that plants and animals can metabolize carbon in water deficient in C-14.<sup>629</sup> Dr. George Carter has concluded that different plants in different regions absorb different amounts of carbon that can unbalance the relation of old and new carbon in them. He also cites the difference between the amount of carbon isotopes in forests and grasslands.<sup>630</sup> This point has also been made by R. B. Morrison, who claims plants may take in through ground water soluble carbon deficient in C-14 but rich in C-12 and C-13 creating dates that are much older.<sup>631</sup>

Tim Flannery further points out with respect to ground water and radiocarbon dating, ". . . what is not often realized is that organic matter carried in ground water can contaminate samples quite easily. This kind of contamination is . . . difficult to detect."<sup>632</sup>

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<sup>627</sup>*Ibid.*, Vol. 7, p. 733.

<sup>628</sup>*Ibid.*, Vol. 2, p. 1040.

<sup>629</sup>J. Gordon Ogden, III, "The Use and abuse of Radiocarbon Dates," *New York Academy of Science*, Vol. 280, (New York, 1977), p. 167.

<sup>630</sup>George F. Carter "Physical Geography," *Geogr. Rev.*, Vol. 43, (1953), pp. 121-124.

<sup>631</sup>R. B. Morrison, "The Pleistocene Boundary: An analysis of various criteria for determining it on a provincial basis and establishing it worldwide," *Geol. Mijnb.*, Vol. 48, (1969), p. 351-371.

<sup>632</sup>*Tim Flannery, The Future Eaters*, (New York, 1995), p. 151.

Now, no one really will ever be able to say with certainty that the plants and animals that lived 8,500 to 3,500 years ago had or did not have ground water sources that contained lots of old carbon.

The second source for adding old carbon to plants that will create extremely ancient radiocarbon dates is the atmosphere. Vine Deloria put his finger on this question by suggesting:

"A related factor here is how an increased percentage of carbon dioxide in the atmosphere would affect our radiocarbon dating. . . . If there was significantly more carbon in the atmosphere, the initial premise of radiocarbon dating—determining the amount of carbon 14 in vegetal and organic material—would be much different at its starting point. We could not assume, as we do today, that the percentage of carbon in material in the late Pleistocene was the same as we find today."<sup>633</sup>

Let us remember that a tree growing near an airport took in sufficient excess old carbon from plane fuel exhausts to give a radiocarbon date of 10,000 years. It should also be noted that this excess of carbon dioxide at the airport was not in any way toxic because people who work at these facilities do not become ill from breathing in this amount of carbon dioxide gas.

The proper question that arises is that related to the two sources—ground water and especially the atmosphere? Were there large reservoirs of old carbon in the Earth that would be released during the hysithermal that created immense amounts of old carbon in the atmosphere and, via rainfall, brought this old carbon to the ground water where it was absorbed by the plants' roots, or stoma, or leaf pores? As we are well aware, the hysithermal warmed up the northern and southern polar regions. Therefore, if there were immense reservoirs of old carbon that could be released by this greater warmth, this process could produce sufficient extra carbon dioxide to the atmosphere and ground water to make all radiocarbon dates much, much older than they are in reality.

This question regarding the Suess Effect during the hysithermal, so far as I am aware, has never been analyzed. Regarding this condition, it is important to emphasize that one should not call upon unique processes nor esoteric sources of old carbon to change the ratio of old and radioactive carbon in the atmosphere and ground water. To the contrary, the sources must be well-known and the processes a natural fallout of the much warmer hysithermal. There are, in fact, a few well-known, major reservoirs on Earth containing old carbon that could only be released by a long period of warming. What will now be delineated are fully understood geophysical, geochemical, and geothermal processes that had to gradually release tremendous amounts of old carbon

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<sup>633</sup>V. Deloria, *Red Earth White Lies*, *op. cit.*, p. 177.

into the atmosphere, which was returned to the soil and ground water over time and that had to have greatly affected the radiocarbon ages of all living organisms on Earth during the hipsithermal.

The first two reservoirs are found in the arctic and near arctic regions in frozen ground, the permafrost. As Robert Jastrow and Malcolm H. Thompson explain, there is a

". . . special property of the reactions that cause carbon dioxide to combine with rocks in the form of carbonates. The effectiveness of the these reactions in removing carbon dioxide from the atmosphere depends very strongly on the temperature of the rocks [or soil]. The higher the temperature of the rocks, the less effective they are in removing carbon dioxide."<sup>634</sup>

The phenomenon is well observed on the planet Mars which possesses a thin atmosphere made up primarily of carbon dioxide. Because Mars has an axial tilt nearly the same as that of the Earth during the extremely cold winter seasons as they alternate at Mars' north and south poles, the carbon dioxide precipitates out of the atmosphere to the cold surface and produces broader white ice caps. Although the phenomenon on Earth is not based on precipitation, it is similar in that carbon dioxide will more readily unite with a cold surface than with a warm one.

What has been totally overlooked with respect to the radiocarbon dating analysis is that during the Ice Age the climate around the polar basins was extraordinarily cold. The tundra regions, as we have been informed by the palynologists, was mostly bare ground and, therefore, an ideal absorber of carbon dioxide. Under the extreme cold, the carbon dioxide would unite with the surface rocks and soils to form various carbonates. Most important for our analysis, this process would be in force during the 130,000 year period of the last Ice Age. The very same sort of phenomena would also occur in the cold ocean water adjacent to the arctic which was not covered by ice. The arctic basin must have been far colder than at present and thus continually absorbed carbon dioxide from the atmosphere. However, when the summer temperature rose and some few feet of the permafrost melted, the near freezing cold water would carry much of the carbon dioxide down below the surface to unite with other substances. According to Walter, C. Oechel, this is just what does transpire; that is, during the Ice Age, a cold tundra would become saturated with carbon dioxide.

"Arctic tundra has been a net sink of carbon dioxide during historic and recent geological times and *large amounts of carbon are stored in the soils of the northern ecosystems.*"<sup>635</sup>

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<sup>634</sup>Robert Jastrow, Malcolm H. Thompson, *Astronomy: Fundamentals and Frontiers*, 3 ed. (New York, 1977), p. 423.

<sup>635</sup>Walter C. Oechel, "Recent change of Arctic tundra ecosystems from a net carbon dioxide sink to a source," *Nature*, Vol. 361, (1993), p. 520.

Oechel has informed us that after the hipsithermal ended a few thousand years ago, the tundra became so cold that it began to absorb atmospheric carbon dioxide. Therefore, if this is the case for recent historical times at the present temperature of the arctic basin, during the Ice Age the colder conditions in these regions would create the very same process. Furthermore, let us recall, as Flint pointed out above, the permafrost in the Americas and Eurasia was far more extensive during the Pleistocene. We are told that presently, "Continuous or discontinuous permafrost underlies as much as one quarter of the Earth's land areas, including 47 percent of the USSR [Russia] possibly 50 percent of Canada and Alaska, and most of Greenland and Antarctica."<sup>636</sup> But during the Ice Age, this surface area also had to have been much greater in extent. Not only would the net temperature be colder, but the net surface area to absorb carbon dioxide would also be greater.

Therefore, during the hipsithermal, when the permafrost melted to great depth and the cold water drained away, the old carbon in the form of carbon dioxide would be re-emitted into the atmosphere which would change the ratio of old carbon to carbon-14, and thus would be absorbed by plants, not only in the arctic, but because of atmospheric mixing and winds, this old carbon would be carried to every region of the Earth. Not only the polar regions, but the tropics as well would receive a share of this inordinate amount of old carbon.

Not only would the permafrost, if it melted, release the inorganic carbon it absorbed from the atmosphere, but it would also release the carbon dioxide reservoir contained in all its frozen organic matter buried in the ground. This would occur because much of this carbon-rich organic material is in the form of peat. Sanderson explains:

"Peat occurs all over the world but most notably in a great belt around the Arctic Circle, from Greenland, Labrador, and Newfoundland, all across Canada to Alaska, thence right through Siberia and northern Russia to Scandinavia, the British Isles, and Iceland. . . .

"Peat may be composed of a great variety of vegetable materials and may vary in color . . . while it may be as much as 90 percent water-logged, or almost devoid of moisture. It is formed in both marshes and bogs by the gradual decay and sinking of sedges, mosses and other water plants. It may reach over thirty feet in depth, and two million tons of dried fuel can be extracted from a square mile of it digging down to a depth of only fifteen feet! It is composed of (apart from water) ALMOST THREE-QUARTERS CARBON and one quarter oxygen, the remainder being hydrogen and gritty ash."<sup>637</sup>

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<sup>636</sup>Clifford Embleton, Cuchlaine A. M. King, *Glacial and Periglacial Geomorphology* (New York, 1975), p. 27.

<sup>637</sup>Sanderson, *Investigating the Unknown*, *op. cit.*, pp. 89-91.

What would happen to much of this organic carbon during the hysithermal when the upper layer of permafrost melted and the water had drained away? These broad regions of peat would be subject to oxidation from the atmosphere as air moved into the soil where the dry peat lay.

Gordon J. MacDonald in a paper delivered at the Third International Conference on the Environment held in Paris on December 11, 1980, suggested that "permafrost . . . probably contains a large reservoir of organic matter. If a warm climate thawed the permafrost, a vast amount of carbon-rich deposits would be exposed to . . . rapid oxidation . . . enhancing CO<sub>2</sub> production."<sup>638</sup> This is exactly what had to have occurred during the hysithermal. By melting the permafrost to great depth all its collected organic and inorganic carbon would be released and oxidized to become a vast amount of atmospheric CO<sub>2</sub>.

In 1982 W. D. Billings, J. O. Lucken, *et al.*, also concluded that the Alaskan tundra contains resources of organic matter that reflect millions of years of vegetation frozen in the soil. and they thought that if the region warmed up the tundra would release billions of tons of this buried carbon.<sup>639</sup>

However, there is yet another substance found in the permafrost that will add even more old carbon to the atmosphere. That substance is methane hydrate. According to Thomas Gold,

"Large areas of the Earth are permanently below the freezing point of water, and all the pore spaces in the shallow surface layers are then permanently occluded by ice. If methane were commonly seeping up through cracks and fissures from below, then we would expect these areas of permafrost to obstruct this flow, and we would expect to find methane in them generally. In fact, this seems to be the case.

"A form of water ice combination with methane, termed methane hydrate . . . , has been recognized only in recent years as representing an enormous deposit of hydrocarbons. The permafrost regions of Siberia, Northern Canada, and Alaska have large quantities of methane hydrates buried in the soil."<sup>640</sup>

Actually methane hydrate is a clathrate or inclusion compound of methane or other gas molecules trapped in the interstices of ice crystals. It is not a true compound, per se. The question is: What would happen to this trapped methane if the permafrost melted? It would be liberated into the atmosphere. However, methane in the atmosphere

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<sup>638</sup>Schneider, Londer, *The Coevolution of Climate and Life*, *op. cit.*, p. 312.

<sup>639</sup>W. D. Billings, J. O. Lucken, *et al.*, "Arctic Tundra: A Source of Sink for Atmospheric Carbon Dioxide in a Changing Environment," *Oecologica*, Vol. 53, (1982), pp. 7-11.

<sup>640</sup>Thomas Gold, *Power From the Earth*, (London, 1987), p. 162.

will oxidize to form carbon dioxide and water. That is, oxygen will combine with a substance to form an oxide. "Examples include the reaction of oxygen with iron to form iron oxide or with methane, a compound of carbon and hydrogen to form carbon dioxide and water . . ."<sup>641</sup> The formula is:



In essence, there are three sources of carbon in the permafrost which would change the ratio of C-14 to C-12, 13 in the atmosphere which would make the age of organisms living on the entire Earth appear to have older radiocarbon dates. However, there is a further source of methane hydrate that is available that will skewer this ratio even more greatly. As Gold explains, further

" . . . on a larger scale still, there are the methane hydrate deposits of the ocean floor, recognized by now in thousands of locations in the Arctic Ocean and in the cold deep trenches that run along the edges of the continents. . . .

"The physical properties of methane hydrates are somewhat different from those of plain water ice. At elevated pressures [found under the oceans] an addition of methane will raise the freezing point of water ice, so that methane hydrates can be present where plain water would have melted. In deep ocean trenches the temperature may allow the sea water to be liquid but methane-loaded ice to form in the sediments just beneath. . . .

"On the basis of extrapolating from the deposits discovered by actual cores and . . . by sonic [sonar] techniques, absolutely gigantic estimates of the total methane content have been produced. One Soviet estimate is that the global sea floor sediments contain one billion cubic kilometers of gas . . .<sup>642</sup> in the form of methane hydrates. . . . It far exceeds the total of all other estimated sources of natural gas."<sup>643</sup>

According to William R. Corliss, ". . . methane hydrate deposits in the world's oceans hold twice as much carbon as all the coal, oil and gas reserves on land! . . . methane hydrate is very unstable; *changes of temperature or pressure on a global basis*

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<sup>641</sup>"Oxidation," *Encyclopedia Britannica, Micropedia*, Vol. VII, (Chicago, 1982), p. 649.

<sup>642</sup>B. White, (1985), "Frozen energy in the depths of the oceans," *New Scientist*, (July 4, 1985), p. 29.

<sup>643</sup>Thomas Gold, *Power From the Earth, op. cit.*, pp. 162-164.

*can trigger the release of immense volumes of this gas from oceanic deposit.*"<sup>644</sup>  
(Emphasis added)

Schneider and Londer also suggest that "it is possible that the compound methane hydrate now locked in oceanic sediments could release vast quantities of CO<sub>2</sub> should the oceans warm up by a few degrees."<sup>645</sup> Continental shelves also contain immense amounts of methane hydrate.<sup>646</sup>

Thus, we are specifically told that if the temperature of the oceans warmed up a few degrees it would release immense quantities of methane which would enter the atmosphere and oxidize to form immense amounts of carbon dioxide. Did the oceans warm up during the hysithermal? According to Charlesworth writing of this period,

"A. G. Nathorst, on the evidence of the flora, the freshwater and marine mollusks, and a few invertebrates showed that it [the water surface] extended over the North Atlantic region [where pack ice presently exists]. . . .

"Warm mollusks inhabited the 'raised beach sea' about the North Atlantic. Alien species no longer living in the local waters tenanted Spitsbergen seas. . . . Marine algae . . . also spread as far north as these islands and Atlantic algae in the northern part of the White Sea. . . . During the same . . . period, . . . warm shells lived off King Charles Land, Franz Joseph Land, Novaya Zemlya, North Siberia and in the White Sea, where [temperate mollusks] today [are] restricted to its warmer parts. . . .

"The same warm sea is registered by the occupance of [temperate type mollusks] in the raised beaches of Ellesmere [Island] and of warmer shells in Baffin [Island], Melville Peninsula, and Southampton Island. . . .

"Greenland shells . . . were then thicker and bigger and included more southerly forms. [These mollusks] whose present limit is Newfoundland, ranged north of the Arctic Circle and . . . into east Greenland, where the sea temperature was [the same as that] of a latitude [520 miles] farther south."<sup>647</sup>

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<sup>644</sup>William R. Corliss, "Methane Hydrate: Past Friend or Future Foe," *Science Frontiers*, (Glen Arm, MD., 1994), pp. 208-209; see also Anonymous, "Did Methane Curb Ice Ages," *New Scientist*, (May 25, 1991), p. 24 and Tim Appenzeller, "Fire and Ice under the Deep-Sea Floor," *Science*, Vol. 252 (1991), p. 1790.

<sup>645</sup>Stephen H. Schneider, Randi Londer, *The Coevolution of Climate & Life* (San Francisco, 1984), pp. 312-313.

<sup>646</sup>Gerald R. Dickens, *et al.*, "Methane Quantities in a Large Gas Hydrate Reservoir," *Nature*, Vol. 385, (1997), p. 426.

<sup>647</sup>J. B. Charlesworth, *Quaternary Era*, Vol. II, (London, 1957), pp. 1483-1484.

Stonehouse specifically tells us, "When air temperatures rise, so too do sea temperatures."<sup>648</sup> The hipsithermal saw the average air temperature rise 4 to 5F. Now it is without question that for these shell organisms to live over 500 miles north of their expected range, the ocean in the arctic was warmer than at present.

According to *Polar Wandering and Continental Drift*, the Atlantic Ocean's surface water temperature increased during the hipsithermal by 6 to 10C [10.8 to 18F].<sup>649</sup> We were told by Gold that the Arctic Ocean has immense deposits of methane hydrate. This demands that an immense amount of methane was released into the Earth's atmosphere at that time. With respect to the rest of the ocean, during the hipsithermal if the poles of the Earth were much more perpendicular to the plane of the orbit a phenomenon may have existed which generated the release of even greater amounts of methane. This process is delineated by Edwin Tenney Brewster who discusses salinity currents:

" . . . the equatorial sun does not only warm the ocean water, it also evaporates vast amounts. What remains tends, therefore, to be a stronger brine, heavier and therefore disposed to sink. Conceivably, the ocean water under the Equator might gain more density than it lost by expansion. In that case, the warm equatorial water would drop down to the ocean floor and creep slowly poleward, to come to the surface, still warm, far to the north or south. So the surface currents would be cool and the bottom currents warm, instead of the reverse as now. That arrangement evidently would warm high [polar] latitudes and cool low [subtropical latitudes] more efficiently than does the present circulation. THIS WOULD TEND TO MAKE A SOMEWHAT EVEN CLIMATE EVERYWHERE. . . . [Capitalization added] But the balance between being expanded by heat and being made denser by evaporation is always delicate. A little change one way or the other, would speed up the circulation of the ocean water or slow it down. Not very much alteration would reverse the circulation completely. So there is some reason to think that our present-day circulation, warm water on top and cold below, is really unusual; and that the normal interchange runs the other way."<sup>650</sup>

Flint, in discussing the temperature of the waters at the bottom of the Atlantic Ocean, claims that the evidence shows that "in the deep Atlantic, temperatures at the glacial maximum were about 2C [3.6F] lower than today."<sup>651</sup> This strongly suggests that, at a minimum, the temperature of the bottom of the ocean was at least 2C warmer after

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<sup>648</sup>Stonehouse, *North Pole South Pole*, *op. cit.*, p. 39.

<sup>649</sup>*Polar Wandering and Continental Drift*, (Society of Economic Paleontologists and Mineralogists, Special Publication, No. 10, (Tucson, Ariz., 1953), p. 96.

<sup>650</sup>Edwin Tenney Brewster, *This Puzzling Planet*, (New York, 1942), p. 227.

<sup>651</sup>R. F. Flint, *Glacial and Pleistocene Geology*, (New York, 1957), p. 442.

the Ice Age ended. But taking into account the fact that the hipsithermal was even warmer than today, the ocean bottom temperature had to have been even warmer than 2°C.

Jon Erickson, on this point, specifically states that after the end of the Pleistocene, there was a "renewal of the deep ocean circulation system which was shut off or weakened during the ice age . . ." <sup>652</sup> This being the case, the methane hydrate in the ocean's bed had to have been released!

And in the other case, there can be little doubt that the carbon dioxide and methane hydrate in the permafrost across the arctic and subarctic to several hundred feet was also released during the hipsithermal and vast amounts of methane hydrate were released from the Arctic Ocean bottom to unbalance greatly the carbon 14 to carbon 12-13 ratio in the atmosphere. There is simply no escaping this fundamental conclusion. If we add the strong evidence of salinity currents to the equation, the amount of carbon dioxide in the atmosphere had to be of even greater significance.

The question is: How much methane alone would be liberated? According to A. A. Trofimuk, *et al.*, the amount of methane hydrate in present tundra land may be as much as 2,000 gigatons [billion tons] <sup>653</sup> According to P. R. Bell, this is "three times the amount currently present in the atmosphere." <sup>654</sup> This means that there is about 700 to 800 billion tons of CO<sub>2</sub> in the atmosphere. Therefore, melting the permafrost during the hipsithermal to about half would add about 1,000 billion tons of old carbon dioxide via methane alone to the atmosphere, more than doubling it based on the present size of the regions covered by permafrost. This suggests a great deal more was released during the hipsithermal from its other sources, as well.

But of greater importance is the methane hydrate in the oceans and continental shelves. According to Yu F. Makogon, there is perhaps 100,000 billion tons in the sediments of the oceans. <sup>655</sup> This is about 14,000 times as much carbon as in the atmosphere. According to Bell, if the sea warmed up a few degrees, the release of methane into the atmosphere would be 8 billion tons per year. In the first chapter of *Carbon Dioxide 1982*, its editor, W. C. Clark, notes that fossil fuel consumption from about 1850 to 1950 injected about 1 billion metric tons a year into the atmosphere. That is, during the hipsithermal about eight times more carbon dioxide per year was released.

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<sup>652</sup>Jon Erickson, *A History of Life on Earth*, (New York, 1995), P. 207.

<sup>653</sup>A. A. Trofimuk, *et al.*, "The Reserves of Biogenic methane in the Ocean," *Dokady Akademii Nauk SSSR*, Vol. 224, No. 4, (1975), p. 936, cited by B. L. Baradough, *Methane Hydrate as an Energy Resource*. LA-8368-MA, (Los Alamos, N.M.), Los Alamos National Laboratory.

<sup>654</sup>P. R. Bell, "Methane hydrate and the carbon dioxide question," *Carbon Dioxide Review, 1982*, W. C. Clark ed., (New York, 1982), p. 401.

<sup>655</sup>Yu F. Makogon, *Hydrates of Natural Gas. Deposits of Natural Gas: A Review of Their Geologic Occurrence*, transl. from 1974 Russian text by Geological Survey Circular 825, (Wash., D.C.), U.S. Dept. of Interior.

What was released between 1850 and 1950 would be released in about 12.5 years during the hysithermal.

Weiner further informs us:

"A sudden global [warming] change . . . would mean chains of new surprises. One of the messiest might come from the floor of the Sea.

"Under conditions of cold temperature and high pressure, methane gas turns into solid ice. At present, these conditions are found in many places on this planet: below the thick permafrost in the Arctic tundra, for example, and on the cold, muddy slopes of the continents from the Arctic Ocean to the Gulf of Mexico. These underwater shelves and slopes represent a huge area—about 5 percent of the surface of the Earth.

"Methane is also thought to be locked in sediments of two cold inland bodies of water, the Black and the Caspian Seas. The gas was accidentally discovered there in the 1970s by a team of geologists aboard the research ship *Challenger*, during the Deep Sea Drilling Project. The geologists used drill rigs to bore and pull up long cores of mud. When they pulled up the core liners and laid them out on the deck, mud began to spatter out of the tubes like pellets fired from an air rifle. . . . Chemical analysis showed that the gas that was propelling the mud out of the coring tubes was almost 100 percent methane.

"On the sea bottom, the methane ice is bound with water ice in a remarkable chemical intertwining called clathrate. . . . When the geologists pulled up the mud to the surface, the clathrate melted, the methane formed bubbles, and the bubbles boiled out of the mud. . . .

"As the temperature of the bottom waters on those continental slopes begins to warm, an awful lot of methane clathrate is going to start escaping from the mud. Of course, the methane will still have to make its way through many fathoms of water to reach the air. But Roger Revelle, who has examined this matter closely, calculates that 'close to 80 percent of the methane released from the clathrate should escape from the mud in bubbles and should rise rapidly to the sea surface before it can be oxidized. . . .

"Taking the middle-of-the-road prediction of a global warming of 3°C [about the same as that of the hysithermal warming], Revelle has calculated that the total quantity of methane that will start rising from the bottom mud as the world warms up will amount to more than half a gigaton a year. In the course of a century, enough methane would be released (by this conservative prediction) to approximately double the amount of methane already present in the atmosphere today.

"If the Arctic icecap disappears, then the bottom waters would warm fast enough in that ocean alone to release another twelve gigatons of methane."<sup>656</sup>

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<sup>656</sup>Weiner, *The Next One Hundred Years*, *op. cit.*, pp. 117-118.

There is yet another phenomenon that will increase atmospheric CO<sub>2</sub>. Wolfgang Berger of the Scripps Institution of Oceanography analyzed the build up of atmospheric carbon dioxide in terms of the "The Coral Reef Hypothesis." When the ice caps melted and flooded, the continental shelves all over the Earth, and when the ocean subsequently became warmer, coral reefs would reestablish themselves on these coastal shelves and grow rapidly in the warm waters. During the process of building these thousands of reefs all across the Earth, chemical combination reactions join calcium and groups made up of bicarbonates in the ocean which form carbonate deposits. But the by-product of this reaction is carbon dioxide. This gas can remain in the seas, but much of it enters the atmosphere. Berger suggests that this is precisely what happened at the end of the Ice Age.<sup>657</sup>

This, too, would be a natural outcome of melting the Ice Age ice caps and warming the oceans. Hence, release of carbon dioxide in great amounts into the atmosphere gives a result that changes the C-14/C-12 ratio greatly. The coral reefs would build up and release old carbon, the permafrost would melt and release old organic as well as inorganic carbon. The permafrost melting would release methane which becomes carbon dioxide. Heating the oceans releases methane as well. All of these processes are a natural fallout of the rising temperature of the Earth during the hysithermal. I believe that because radiocarbon dating is the one great backbone and support of the superstructure of the uniformitarian history of the past, to which researchers have devoted their professional lives, all this evidence for a distorted ratio of C-14 to C-12, created by the great warmth of the postglacial epoch, will be denied.

Velikovsky has informed us that humans who died in this century, prior to the atomic bomb tests, received so much dead carbon from fossil fuels released into the atmosphere, that they are dated much older than humans who died in the last century prior to this fossil fuel burning. We were also told that organisms in a rich old carbon environment were radiocarbon dated several thousand years older than they actually were, and a tree by an airport actually was dated to be 10,000 years old. What would happen during the great warmth of the hysithermal to all the organisms subjected to an immensely greater amount of dead carbon in the atmosphere? Over the 3,000 to 5,000 years of the hysithermal, this would add between 24,000 billion to 40,000 billion tons of old carbon to the atmosphere or about 40 to 50 times its present amount gradually increasing over time or it would increase the carbon dioxide from its present 0.003 percent to between 0.12 and 0.18 percent. This amount would be much too immense for life. However, the carbon dioxide would have built up gradually and vast areas of the tundra and desert areas would have become lush forested regions. To repopulate the former tundra and deserts with a lush vegetation would have removed much of this atmospheric carbon dioxide as it built up. There is no reason to conclude the amount of CO<sub>2</sub> in the atmosphere was ever lethal.

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<sup>657</sup>Wolfgang Berger, "Increase of carbon dioxide during deglaciation: The coral reef hypothesis," *Naturwissenschaft*, Vol. 69 (1982), pp. 87-88.

Whatever the new ratio of carbon was during the hypsithermal, it appears it was quite sufficient to give the organisms living at that time a totally different amount of old carbon than uniformitarians assumed, and the radiocarbon dates of these organisms would have been many thousands of years older. There is also the probability that all this additional carbon dioxide dumped into the atmosphere may have also created a limited greenhouse effect for a few thousand years, as well, adding to the overall warmth of the Earth.

This concept regarding climate warming was presented by E. G. Nisbet.

"Methane-gas hydrates may have contributed to the rapid rise in atmospheric CH<sub>4</sub>, CO<sub>2</sub>, and global temperatures at the end of the last glaciation, about 13,500 years ago. Given suitable orbital conditions and insolation at high latitude, a small triggering event, such as the release of one or more Arctic gas pools, may have initiated a massive release of methane from hydrate under ice and in permafrost. The consequent greenhouse warming would have provided strong, positive feedback, amplifying emission."<sup>658</sup>

He goes on to suggest that "the increase in CO<sub>2</sub>, CH<sub>4</sub>, and temperature was abrupt."<sup>659</sup> Nisbet goes on to discuss that the most probable source is CH<sub>4</sub> [is] trapped in glacial and tundra hydrate."<sup>660</sup> He further points out, "warming would have been most intense in the polar regions with temperature changes of up to 10°C [18°F]."<sup>661</sup>

"Once initiated, CH<sub>4</sub> emission from permafrost would not stop for some centuries unless halted by a major cold pulse. Furthermore, significant areas of permafrost would be inundated as sea level rose. The incursion of water would immediately raise the surface temperature of the flooded permafrost to nearly 0°C [32°F], producing a thermal pulse. This pulse would make gas hydrate in off-shore permafrost thermally unstable within a century. Areas of inundation . . . included the Kara and east Siberian seas, the North Sea, and the Arctic coast of Canada. . . . Massive CH<sub>4</sub> emission would have resulted from the subsequent decay of offshore permafrost. Consider a region with a mean annual temperature of -17°C (equivalent to that of the High Arctic today), warmed by incursion of seawater to a temperature of 0°C at the sediment-water boundary. At 50 m[eters] depth after 50 years the heat flow downwards, warming the hydrate, . . . the warming would liberate 2 - 2.5Kg [4 to 5.5 pounds] of CH<sub>4</sub> per square meter

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<sup>658</sup>E. G. Nisbet, "The End of the Ice Age," *Canadian Journal of Earth Sciences*, Vol. 27 (1990), p. 148.

<sup>659</sup>*Ibid.*, p. 149.

<sup>660</sup>*Ibid.*, p. 151.

<sup>661</sup>*Ibid.*, p. 152.

[about one square yard] . . . Globally, the total CH<sub>4</sub> output of hydrate may have been 10<sup>14</sup> - 10<sup>15</sup> g/year over a period of 100-1000 years."<sup>662</sup>

Nesbit suggests ". . . the increase in atmospheric CO<sub>2</sub> would then be taken up by biological organisms. A sustained release of CH<sub>4</sub> would then be taken up by biological organisms. A sustained release of CH<sub>4</sub> from hydrate would substantially enrich the biosphere and would allow the subsequent development of boreal forest and peat bogs and the expansion of tropical forest."<sup>663</sup> All in all, the thesis that the warming of the Earth must lead to enormous emission of methane hydrate which would be converted to water and carbon dioxide is fully corroborated, based on Nesbit's analysis. What is not fully recognized is that these releases would have lasted for millennia and, more importantly, would have created a profound Suess Effect, causing the radio carbon age of the flora and fauna to appear to be tens of thousands of years older than they were in reality. Weiner has described the entire scenario tersely:

"Like the sudden disappearance of the Arctic Icecap, this feedback [heating] effect from methane could make the planet warm up more and faster than predicted. Of course, the two effects—the warming of the Arctic Ocean and the bubbling-up of methane—will speed up each other and . . . fortunately, all of this methane will be broken down and oxidized in the atmosphere in a few hundred years. Unfortunately, it will break down into water and carbon dioxide, the great exhalation from the world's sea muds will last for many millennia, and may help unlock more billions of tons of methane. . . ."<sup>664</sup>

However, the release of carbon would not have gone on during the entire period. After a few thousand years, the release of methane hydrate would have halted because equilibrium between the thermal conditions in the atmosphere and oceans and land would have been eventually reached, which would stop further emissions of this gas.

Furthermore, the growth of forests over vast areas of the Earth would, over time, remove this massive buildup of carbon dioxide as Weiner further explains.

"In 1976, the physicist Freeman Dyson thought of a way to solve the greenhouse problem [caused by a large increase of CO<sub>2</sub> into the atmosphere]. He was spending the summer at the institute for Energy Analysis in Oak Ridge, Tennessee . . . Dyson and several other scientists asked themselves 'What would it require to remove . . . billion[s] of tons of carbon, as carbon dioxide, from the atmosphere annually. . . . They decided the simplest trick would be to plant trees.

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<sup>662</sup>*Ibid.*, pp. 153-154.

<sup>663</sup>*Ibid.*, p. 154.

<sup>664</sup>Weiner, *The Next One Hundred Years*, (New York, 1990), pp. 118-119.

"Trees take carbon out of the air in the course of photosynthesis as part of the breathing of the world. Plant an oak and you take [tons of carbon] out of the air [as trunk, branches, and roots, as well as some of its leaves] and hold it down in the ground for one hundred years."<sup>665</sup>

Pekka, Kauppi, *et al.*, evaluating forest expansion in Europe and North America from 1971 to 1990 suggested they were acting as sinks for CO<sub>2</sub> released by tropical deforestation.<sup>666</sup> As we will see below, carbon dioxide promotes plant growth and during the hiphothermal there was an immense expanse of plant growth toward the polar regions as well as into the broad desert belts that encompass the globe which, over thousands of years, would remove carbon dioxide from the atmosphere.

Whatever imbalance existed during the early phases of the emission, carbon dioxide would have been removed from the atmosphere by immense plant growth and perhaps from other processes. Thus, at some later point, perhaps around 4500 years ago, the near equilibrium would then allow organisms to gradually give more nearly recent radiocarbon dates. All these processes must occur for basic biological and meteorological reasons. Nothing in this analysis is ad hoc nor unique. Heating up the Earth during the hiphothermal demands that all these processes, to a greater or lesser degree, came into play and added great amounts of old carbon to the atmosphere, which would be taken in by plants. Any organism that ingested and metabolized this organic carbon would be, as with those organisms described above, taking in inordinate amounts of old carbon and must exhibit a radiocarbon age that is extraordinarily older than its true age, just as with the tree described growing near an airport.

From the moment of its conception, a mammal embryo would be adding more old carbon to its tissues from its mother's blood and after birth from her lactating breasts, than is considered normal by advocates of the radiocarbon method. Then, as it fed on the old-carbon-enriched flora and built bone and other tissues, it would continue to accumulate ever more of this old carbon in its tissues day in and day out, year in and year out, until its death. Carnivores feeding on these organisms would also incorporate this old carbon and must show similarly old radiocarbon ages.

A further point worth emphasizing is that large bones once deposited in temperate soils will survive far longer than those smaller ones.<sup>667</sup> As Stanley explains, "Elephants are so large that their bones and teeth are readily preserved. . . ."<sup>668</sup> Thus, there would have been immense number of mammoth bones lying in the soils of Siberia, Alaska, North America and Europe all through the hiphothermal that would, when the climate changed, have been preserved.

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<sup>665</sup>Weiner, *The Next One Hundred Years*, *op. cit.*, p. 226.

<sup>666</sup>Pekka, Kauppi, *et al.*, "Bio Mass and Carbon Budget of European Forests 1971-1990," *Science*, (Apr. 3, 1992), p. 70.

<sup>667</sup>Shipman, *Life History of a Fossil*, *op. cit.*, pp. 22-23.

<sup>668</sup>Stanley, *The New Evolutionary Timetable*, (New York, 1981), p. 99.

In a clear sense, this not only explains the old dates of the organisms that lived during the hipsithermal, but also explains how it is possible to date a mammoth to one age, and the wood found with it to a different age, and the food in its mouth or stomach to still another age, as described above.

Those mammoths and other organisms that died, and whose bones or tissues survived destruction during and at the end of the hipsithermal, would then be depositing their bones in ground without being destroyed by solifluction lobes. But, more importantly, while this phenomenon persisted, these bones, etc., would have been covered in soil enriched with old carbon and thus would have been contaminated with even additional old carbon. In the end, we must have a vast population of bones, tissues, and wood, all across the Earth, that would yield extremely old radiocarbon dates. And I emphasize that this would have been a worldwide phenomenon that would have run its course during the early to middle, and even late times, of the hipsithermal. The organisms that lived during the early hipsithermal would have received the greatest amount of the old carbon; those that lived in the middle would probably receive less, and those that lived to the end, and perhaps beyond, would exhibit their correct radiocarbon ages, such as the dwarf mammoths on Wrangel Island.

This is what these natural processes must produce. Taken together with the corroborating evidence that neither mammoths nor other mammals, insects, mollusks, etc., could have lived in the arctic during the Ice Age, we can now see how directly these various pieces of evidence fit together and corroborate one another. Velikovsky's time-scale is in complete harmony with each and every piece of evidence while that of the uniformitarians and other catastrophists who require a 10,000 year old extinction have to face contradiction after contradiction. Velikovsky's theory makes remarkably good sense in terms of radiocarbon dating. There are no odd fitting pieces to the extinction puzzle.

An excellent way to analyze this concept is related to the process of photosynthesis. Plants take in carbon dioxide and water and process them in the presence of chlorophyll to produce various carbohydrates such as glucose. Therefore, vegetation even on an Earth with a much smaller axial obliquity would have variable growing seasons to carry on this photosynthetic process. The vegetation belts closer to the equator would have the longest growing seasons, and as one moves toward the poles, this season of growth would become shorter. Therefore, if all or nearly all of the megafauna—especially the various forms of mammoths—became extinct at virtually the same time, those that ate vegetation nearer to the equator would ingest foliage that carried on much more photosynthesis than those mammoths farther and farther north. Those farther north would, during the longer fall, winter, and spring periods, consume drier grasses and other foliage that had stopped processing carbon dioxide during these seasons. While the megafauna in the more southern regions would be adding much more old carbon to their bones and tissues, those to the north would be adding less. Although the radiocarbon dates of all the regions would extend as far into the distant past as radiocarbon equipment is sensitive enough to measure, the final extinction would leave those in the southern ranges with more old carbon and hence an older date for their die-off compared with a younger date for their end to the north. Of course, a catastrophe would, in many instances, create a jumble of dates; nevertheless, the overall picture should resemble this

process. Also, one must not assume the pole was at its present point during this period which will complicate the analysis. However, this general analysis should show an extinction tending to move from the south toward the north.

Before proceeding, however, I wish to point out what the effect of that additional carbon dioxide in the atmosphere will have on plant growth. There have been a great many studies carried out on elevated CO<sub>2</sub> abundance on plant growth. In 1804, T. de Sature showed that pea plants in a rich CO<sub>2</sub> environment grew larger and more rapidly than the same plants under ordinary atmospheric conditions.<sup>669</sup> In 1902 and 1904, E. Demoussy, also showed that sixteen different plants in a CO<sub>2</sub> enriched environment, had a weight increase of 160 percent.<sup>670</sup>

According to Sherwood B. Idso, who gathered this data and enlarged upon it, the results of these same values

" . . . were soon thereafter obtained in America when [M. B.] Cummings and [C. H.] Jones conducted extensive experiments on a number of plants between 1909 and 1916. Thus it was, that when a group of experts in the field gathered at Duke University in Durham, North Carolina on August 4-5, 1977 for a 'Workshop on Anticipated Plant Responses to Global Carbon Dioxide Enrichment,' they had no trouble at all in preparing an annotated bibliography of fully 590 papers touching on various aspects of the CO<sub>2</sub>-agriculture connection, concluding that increased levels of atmospheric CO<sub>2</sub> generally led to increases in plant photosynthesis, decreases in water loss by transpiration, increases in plant tolerance of atmospheric pollution, increases in leaf area, increases in leaf dry weight per unit leaf area, increases in branch numbers, increases in fruit numbers, increases in fruit size, increases in numbers of seeds produced per plant, better germination of seeds and spores, earlier production of flowers, accelerated maturity of crops, and greater dark fixation of CO<sub>2</sub>—to name the most obvious examples."<sup>671</sup>

Therefore, plants in a region with a longer growing season would take in greater amounts of carbon dioxide during the year than plants in a region with a shorter growing season. Animals that ingested and assimilated this greater amount of organic CO<sub>2</sub> in the south would also exhibit an extinction date that was older than those that received less of this organic carbon. Hence, we would in general expect that the most southern fauna that

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<sup>669</sup>T. de Sature, "Recherches chimiques sur la végétation," A. Wieler, transl. as cited by D. C. Dalrymple, "A global review of greenhouse food production," (U. S. Dept. of Agriculture, Economic Research Service), (1973), p. 44.

<sup>670</sup>E. Demoussy, "Sur la végétation dans des atmosphères riches en acide carbonique," *Comptes Rendus Academy of Sciences*, (Paris, 1902-1904) Vol. 136, pp. 325-328, Vol. 138, pp. 291-293, Vol. 139, pp. 883-885.

<sup>671</sup>Sherwood B. Idso, *Carbon Dioxide: Friend or Foe*, (Tempe, Ariz., 1982), p. 72.

became extinct would tend to exhibit an extinction date that was older than those to the north, and those in the far north would appear to have died off last. This is what must follow if the conditions of atmospheric carbon dioxide was greatly increased. Again, there is nothing ad hoc regarding this analysis; it is a natural fallout of the conditions that had to occur on Earth during the hipsithermal. What, then, does the evidence show in this respect?

According to David M. Raup, Sewell Avery, Distinguished Service Professor, and a statistical paleontologist at the University of Chicago, and member of the Natural Academy of Sciences, claimed

"The woolly mammoth died out about 18,000 yr BP (years before present) in China, 14,000 yr BP in Britain, 13,000 yr BP in Sweden, and sometime after 12,000 yr BP in Siberia. . . .

"In North America, carbon dating of Pleistocene extinctions converges on a narrow range from 10,800 to 11,000 yr B.P. . . ."<sup>672</sup>

According to Martin, the extinction began in Africa 40,000 years ago and then seems to have spread north into Europe, northern Asia, and the Americas.<sup>673</sup>

As Owen Smith pointed out in the Americas, ". . . dates of fossils in North America do not support Martin's notion of a blitzkrieg rolling southward . . ."<sup>674</sup> In Eurasia and the Americas, the general picture well supports this interpretation. Haynes on this states:

". . . Keeping these dates in mind, it appears that there may have been a . . . south-to-north gradient for the time periods of mammoth disappearance, with central and southern Eurasian mammoths dying out first followed by Siberian and American mammoths."<sup>675</sup>

The climate hypothesis cannot explain this because the southern equatorial regions had the least climate change and thus the mammoths should have survived there the best. The hunting hypothesis also fails to explain this because Africa and Eurasia had the greatest number of hunters and should have killed off most of the megafauna, but in Africa and southern Asia, the megafauna survived best.

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<sup>672</sup>Raup, *Extinction: Bad Genes or Bad Luck*, *op. cit.*, pp. 89-90.

<sup>673</sup>White, *Poleshift*, *op. cit.*, p. 34.

<sup>674</sup>R. N. Owen Smith, *Megaherbivores*, *op. cit.*, p. 291.

<sup>675</sup>Haynes, *Mammoths, Mastodons & Elephants*, *op. cit.*, p. 267.

In terms of the Seuss Effect and carbon 14 dating, this south to north extinction effect is well corroborated. Haynes also speaks of a "west-to-east" extinction<sup>676</sup> which suggests that the geographical pole was not in its present place which skewed the growing seasons on the globe along different latitudes.

Naturally, there are exceptions to this overall picture. But the exceptions, explicable in terms of the age of the animal at death and ground water conditions, etc., prove the rule. The evidence does appear to be in full agreement with this hypothesis and makes excellent scientific sense.

If the Seuss Effect was truly operating as just described, then it should show much the same greater age for plants. Interestingly, Diamond, in this regard, remarks that there are

". . . radiocarbon dates of about 16,000 years. . . . At Meadowcroft [rock shelter in Pennsylvania]. No archeologist denies that many human artifacts do occur in many carefully excavated layers. But the oldest radiocarbon dates don't make sense because the plant and animal species associated with them are [temperate] species living in Pennsylvania in recent times of mild climates, rather than species expected for the glacial times 16,000 years ago."<sup>677</sup>

Lewin points out that around "this date the southern edge of the continental ice sheet would have been less than 50 miles north of any Meadowcroft community."<sup>678</sup>

Fiedel remarks, *vis á vis* this contradiction, that "The few animal bones from [this layer] do not resolve the apparent contradiction between the radiocarbon dates and the [temperate] paleobotanical evidence. Among the highly fragmented bones was a piece of antler that could be confidently assigned to the white-tailed deer. Other identified specimens represent the passenger-pigeon and southern flying squirrel. All these species usually inhabited temperate, deciduous forests."<sup>679</sup>

In discussing this problem, Grayson admits:

"The biggest problem is presented by plant material, associated with radiocarbon dates that fall between about 13,000 and 14,000 years ago. The plants represented in this sample include oak, hickory and walnut. These are all components of modern vegetation.

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<sup>676</sup>*Ibid.*

<sup>677</sup>Diamond, *Guns, Gems, and Steel*, *op. cit.*, p. 48.

<sup>678</sup>Lewin, *In the Age of Mankind*, *op. cit.*, p. 163.

<sup>679</sup>Fiedel, *Prehistory of the Americas*, *op. cit.*, p. 54.

"Paleobotanical work, however, has shown that between 13,000 and 14,000 years ago the vegetation surrounding Meadowcroft was likely to have been spruce woodland, [fir trees] not deciduous forest. Indeed, hickory does not appear to have arrived in southwestern Pennsylvania until well after 10,000 years ago, and there are no remains of spruce woodland plants [even] at all at the bottom of Meadowcroft. The plants are bothersome."<sup>680</sup>

Hackberry seeds were also found at the site which suggests these seeds were used for food and grinding for flour.<sup>681</sup> But Hackberry trees, or the genus *Celtis Accidentalis*, is a temperate tree that is from 40 to 100 feet tall.<sup>682</sup>

The very same evidence exists for radiocarbon dated vegetation in the arctic region. We are told that, on Baffin Island some 900 miles from the pole,

"Alder and birch remain [in peat that] suggests a slightly warmer climate than today. Taken in conjunction with . . . leafy peat taken at the same site . . . (30,000 ± 1200 yrs) there is a strong implication that during the period 24,000-30000 B.P. [before the present] the large portion of North Central Baffin Island was ice free or at least carried less glacier ice than today."<sup>683</sup>

Yet it is well-known that during this period "the Wisconsin continental glacier was going through a vast expansion."<sup>684</sup> Hapgood goes on to show on various Arctic Ocean islands that shells of warm water mollusks also date to the Wisconsin Ice Age from about 35,000 to 25,000 years ago.<sup>685</sup> He goes on to show "Large tree trunks from the banks of the Yenisey River" date to "21,350 ± 650" years ago.<sup>686</sup>

This evidence, however, is perfectly understandable in terms of the Seuss Effect. Let us not forget that the anciently dated flora eaten by mammoths and horses in the far north, was found again and again to be of a temperate species, which grew there during

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<sup>680</sup>Grayson, *The Desert's Past*, *op. cit.*, p. 60.

<sup>681</sup>J. M. Adovasio, *et al.*, "Meadowcroft Rockshelter," *Early Man in America*, A. L. Bryan ed., (Alberta, Canada, 1978), p. 156.

<sup>682</sup>*Encyclopedia Britannica Micropedia*, Vol. II, (Chicago, 1982), p. 675.

<sup>683</sup>"Radiocarbon," *American Journal of Science*, as cited in Charles Hapgood, *The Path of the Pole*, *op. cit.*, p. 93.

<sup>684</sup>*Ibid.*

<sup>685</sup>*Ibid.*, pp. 96-97.

<sup>686</sup>*Ibid.*, p. 99.

the hipsithermal. Rather than accepting this clear indication that temperate flora did not grow in the arctic during the Ice Age, and that inordinate amounts of old carbon have made these organisms appear to be too old, the uniformitarian theory has made it impossible to interpret this data. What we do know is that temperate flora only grew in the polar regions during the hipsithermal, as proven by the pollen studies. Thus, all this temperate vegetation dated to the Ice Age in the arctic fully corroborates the thesis presented here.

One further piece of evidence which also corroborates this analysis is that of animals known to be living only in certain regions during the hipsithermal long after the mammoth are believed to have become extinct, should also exhibit the very same ages as those of mammoths. This, in fact, is just what has been found by scientists in Europe who apparently were not under the influence of the dogma that forbids the reality of such findings.

"In 1991, construction workers at Tysfjord, Norway, 125 miles north of the Arctic Circle, accidentally dug up polar bear bones at least 42,000 years old, probably 60,000. R. Lie, a zoologist at the University of Bergen, and other scientists subsequently found the bones of two more polar bears in the area. These were dated as about 20,000 years old. An associated wolf's jaw was pegged at 32,000 years.

"The problem is that Norway and some other northern circum-polar lands are believed to have been buried under a thick ice cap during the Ice Ages. In particular, northern Norway is thought to have been solidly encased in ice from 80,000 to 10,000 years ago. Polar bears could not have been living there during this period. Clearly, something is wrong somewhere."<sup>687</sup>

According to the Associated Press report titled "Bear-bones find challenges idea of when Ice Age began in Norway," for August 23, 1993, there were finds not only of the remains of polar bears, but of wolves, field mice, ants, and *tree pollen*, in the same area dated to the Ice Age.

Therefore, what we have are animals clearly known to have been living during the hipsithermal in these circumpolar regions up to the present, but giving dates as old as mammoths. What this most decidedly indicates is that mammoths also lived during the hipsithermal in circumpolar regions and their radiocarbon dates, which are as old as those of the polar bears, reflects this coexistence.

An excellent way to test this time of extinction event is to determine where warmth-loving animals survived after the mammoths had gone. If, as the present theory suggests, the extinction took place at the end of the Ice Age, and the Earth subsequently

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<sup>687</sup>William R. Corliss, *Scientific Frontiers*, No. 101, (Sep-Oct, 1995) pp. 2-3; see also, Anonymous, "Polar Bear Bones Cast Doubt on Ice Age Beliefs," (An Associated Press dispatch) in the *Colorado Springs Gazette*, (Aug. 23, 1993).

warmed up several degrees, warmth-loving animals would have survived in the north and should have migrated farther northward. If as Velikovsky suggests, the extinction took place at the end of the hipsithermal and the Earth subsequently cooled down several degrees, the warmth-loving animals would have died out in the northern regions or migrate south and would survive in the southern regions in America which warmed because of the poleshift he proposes. This is exactly what did occur, as Flannery reports:

"Species as diverse as armadillos, tapirs, jaguars, spectacled bears, llama, ocellated [spotted] turkeys and peccaries all moved southwards. This is quite a surprising pattern, for all these warmth-loving species were withdrawing from the north of the continent just as it was heating up. Just why they survived in South or Central America while becoming extinct in the northern margins of their range is an intriguing question."<sup>688</sup>

This is in no way surprising in terms of the extinction taking place at the end of the hipsithermal 3,000 to 4,000 years ago. Since North America became considerably cooler and these warmth-loving animals either migrated south to the latitudes of greater warmth or died because they could not adjust to the colder climate that held sway. This evidence thoroughly contradicts the timing of the extinction at the end of the Ice Age and supports and corroborates Velikovsky's extinction timetable.

For those who disagree strongly with this analysis, it should be pointed out that when radiocarbon dating was first tested with Egyptian artifacts, the dates past 1,000 B.C. were found to be too young. And the farther back in time artifacts were dated, the margin of discrepancy increased.

"All radiocarbon dates on samples of unquestionable origin and quality are older than the historical record.

"The largest number of samples, fifteen, were taken from the Khufu pyramid whose average calibrated radiocarbon age is  $2966 \pm 50$  years B.C. This is approximately 390 years older than the midpoint of Khufu's reign according to the tabulation of *Cambridge Ancient History*."<sup>689</sup>

In essence, all dates in Egypt and elsewhere show that, in historical times, the relics that are radiocarbon dated are older than they should be. But this, of course, is just what has been shown to be correct, based on the massive release of old carbon into the atmosphere. The dates became older and older as one goes back in time, just as the evidence disclosed above suggests. This further suggests that the onset of ancient

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<sup>688</sup>Flannery, *The Eternal Frontier*, *op. cit.*, p. 211.

<sup>689</sup>Herbert Hass, "British Archaeological Record, Vol. 379 (11), pp. 585-606 as he stated at "The First International Symposium on the Application of Modern Technology to Archaeology Exploration of the Giza Necropolis" held in Cairo, Egypt, December 14-17, 1987 where he made this statement.

civilizations are probably significantly closer to the present than assumed. But in this case, the historians were adamant and refused to change their dated chronology. According to Dunbavin,

"The Egyptologists . . . refused to accept that their chronology could be in error by such a huge margin. They insisted that there had to be a flaw in the radiocarbon method. If it yielded results which were too young, then possibly this was an indication that there was more carbon 14 in the atmosphere prior to 1,000 B.C."<sup>690</sup>

The various establishments have had no qualms about adjusting the results of radiocarbon dating to support their preconceived chronology by changing the ratio of carbon 14 and carbon-12 in the atmosphere at that ancient time. What these same chronologists have failed to do is understand and relate the natural processes that must follow from heating up the atmosphere and oceans during the hysithermal that must also affect this ratio of carbon 12 and carbon 14 significantly. It is only by ignoring this evidence that they can perpetuate the concept that dating of materials during the hysithermal was not affected by this long, warm period.

Paul Martin, in the abstract of a paper, jabs at Velikovsky's book and argues that because the Pleistocene extinction was spread out over "Several thousand years, it separated the time of megafaunal extinctions on different continents, eliminating any possibility of 'instantaneous' or 'simultaneous' extinction. *Presumably no worlds collided.*"<sup>691</sup> (Emphasis added)

It has been argued here that the extinction was extremely swift, occurring in days to weeks and, at most, centuries for a few survivors. On the other hand, uniformitarians may strenuously oppose this because the effect is too rapid and radiocarbon does not really support such a sharp, overnight destruction. In this respect, recent statistical research derived from analysis of the dinosaur extinction is quite applicable to that of the Pleistocene. The question is that if

". . . the dinosaurs were killed off by . . . [a] comet's collision with Earth, shouldn't their skeletons occur right up to this boundary and then disappear? . . . Other scientists, however, examined this premise, and when statisticians began to run the numbers on this question, they arrived at a seemingly illogical conclusion. They found that it is highly improbable that fossils will ever yield a true picture of extinction, even when extinction is sudden. Various tests showed that even in cases where an extinction was known to be abrupt for many species, imperfections in the fossil record made it look gradual. The concept that a sudden extinction will always look gradual—that it will leave a record that

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<sup>690</sup>Dunbavin, *The Atlantic Chronicles*, *op. cit.*, p. 119.

<sup>691</sup>Martin, *Extinctions*, *op. cit.*, p. 330.

suggests the fossils disappeared before the actual sudden extinction horizon—is now called the Signor-Lipps effect after Professors Phil Signor and Jere Lipps of the University of California.

"It was just this argument—that the extinction of the large Ice Age mammals looked gradual not sudden—that has led many anthropologists to conclude that the cause of Ice Age mammal extinctions could not possibly be related to a sudden catastrophe, such as overkill."<sup>692</sup>

Gould explains this concept:

"Some species are very common and easily preserved as fossils; we may, on average, find specimens in every inch of strata. But other species will be rare and poorly preserved, and we might encounter their fossils only once every hundred feet or so. Now, suppose that all these species died suddenly in an ocean basin. Would we expect to find the most direct evidence for mass extinction—that is, fossils of all species through all four hundred feet of strata, right up to the very top of the sequence? Of course not.

"Common species would pervade the strata, for we expect to find their fossils in every inch of sediment. But even if rare species live right to the end, they contribute a fossil only once every hundred feet or so. In other words, a rare species may have lived through four hundred feet, but its last fossil may be entombed one hundred feet below the upper boundary. We might then falsely assume that this rare species died out after three-fourths of the total time elapsed. . . .

"If all species died at once, we will still find a graded and apparently gradualistic sequence of disappearance, the rare species going first and the common forms persisting right to the upper boundary. This phenomenon—a classic example of the old principle that things are seldom what they seem, and that literal appearances often obscure reality—even has a name: the Signor-Lipps effect. . . ."<sup>693</sup>

But by the same token, the Signor-Lipps effect must also apply to a celestial catastrophe for the extinction of the mammoths, as well as for that of the dinosaurs. One cannot claim, on the basis of dating of the fossils of mammals, that their end was gradual. It could also have been as catastrophic as the catastrophe which overcame the dinosaurs. To accept the scale of the dinosaur die off one must also allow the same scale for the mammoth's end because the same statistical rules apply.

However, there is one further problem that must be addressed; namely, the fact that so very few frozen carcasses have been preserved in the soil. It may also be argued

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<sup>692</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, pp. 170-171.

<sup>693</sup>Gould, *Dinosaur in a Haystack*, *op. cit.*, pp. 150-151.

that if Velikovsky's catastrophe occurred 3,500 years ago, there would have been innumerable frozen carcasses buried. Why, then, are there so very few preserved mammoths found in the permafrost? To this question, I suggest the answer lies largely in the fact that the arctic basin is a vast region. It has not been thoroughly excavated and as Vereschagin pointed out at the beginning of this work, there is heavy erosion on the arctic coast which spills into rivers thousands of tusks and tens of thousands of bones. Therefore, a great many of the mammoths such as the one observed floating in the Lena River<sup>694</sup> had to have been lost.

This is discussed by Dyson:

"Adams' mammoth carcass probably was the best one ever found in frozen ground of the Siberian tundra, but it certainly wasn't the first. . . . But well-documented finds of frozen elephant carcasses were made in the seventeenth century [1600's]. In a paper published in the *Transactions of the American Philosophical Society*, in 1929, I. P. Tolmachoff listed thirty-four between 1692 and 1924. . . . Many finds were lost to science because they were destroyed before they could be investigated. Many others probably were discovered but, because of remoteness, never were reported."<sup>695</sup>

There is also the fact that there have been a few long warm episodes that occurred after the burials, after the hipsithermal. For example, between the 11th and 15th centuries A.D., there was a 400 to 500 year period of warm weather which permitted Greenland to be settled. This period of warmth was not as great as that of the hipsithermal and lasted only about one tenth as long. In Greenland, the Vikings were able to dig into the ground, which had "thawed to a considerable depth, for the early coffins were buried . . . deeply."<sup>696</sup> We are told that the roots of plants penetrated these graves.<sup>697</sup>

And there was also a warm period between 1890 to about 1940.<sup>698</sup> Therefore, the permafrost, which presently melts to a depth of about five feet during these warm spells, may have melted in places 10 to 20 feet, and a great many of the mammoth carcasses that had thawed would have rotted significantly during such warm stages. Some researchers in Siberia have remarked about the stench of decayed flesh that often permeates the tundra which would thus be associated with such destruction of the upper layers of the permafrost. Much ivory, too, would have been made useless by the same process.

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<sup>694</sup>H. H. Lamb, *Climate History and the Future*, *op. cit.*, p. 158.

<sup>695</sup>Dyson, *The World of Ice*, *op. cit.*, p. 145.

<sup>696</sup>C. E. P. Brooks, *Climate Through the Ages*, 2 ed., (New York, 1970), p. 356.

<sup>697</sup>*Ibid.*

<sup>698</sup>Borisov, *Can Man Change the Climate*, *op. cit.*, pp. 43-58.

However, below the depth of the melt the more deeply buried carcasses, wood, and ivory would have been preserved.

Another question that one may pose is this: If, as is here proposed, that mammoths survived right through to about 3,500 years ago, why are no mammoth remains found in north central and north eastern Canada where conditions for their survival were excellent? Surely the mammoth, if it lived at that time, would have migrated into these regions. But there is no evidence that the mammoth lived there and this contradicts the model being proposed.

Pielou presents a map on page 170 of her book, *After the Ice Age*, in which she shows that the teeth of woolly mammoths are only found for the period from 18,000 to 11,000 years ago generally south of or at the same latitude of the Great Lakes.

However, when the ice cap disappeared, it left behind a wall of lakes and torrential rivers emptying these lakes right across this region. The MacKenzie River flowing north was emptying Lake McConnell which stretched south almost to Lake Agassiz which stretched far south into the United States and emptied into the Minnesota River. And clearly between these two giant lakes, water flowed making land crossing impossible for thousands of years.<sup>699</sup> These lakes may well have survived well into the hipsithermal for we are also informed that "experts disagree about . . . [the] dates" these lakes lasted.

Moving the date of the near final destruction of almost all of the megafauna to the end of the hipsithermal clearly explains a great many things. It explains the great number of useful tusks, and preserved bones and wood taken from the permafrost as well as the radiocarbon dates of the mammoths and other animals and vegetation found frozen in the ground. We know solifluction lobes would have destroyed these materials. It further explains why the mammoths along with the rest of the grazing herbivores could find the quantity and quality of the nourishment they require from this habitat. This also explains why these large, heavy quadrupeds could move across this region because most of the bogs had drained and the dry soil could support their weight. This concept is in full agreement with the findings of the palynologists who proved that these arctic lands could not have provided sufficient nutritional flora to support a large grazing population of megaherbivores during the Ice Age. It explains why temperate animals such as horses, bison, temperate mollusks, temperate insects, and the many other temperate animals, could survive and thrive, sharing this temperate biome with the mammoth. It explains why the flora found with them and in their mouths and stomachs is the kind of flora that will only grow in a fully temperate climatic zone. It explains how so many large temperate type trees are found rooted in the ground with mammoths or are scattered below ground with them. It explains how dwarf mammoths could live well above the Arctic Circle on Wrangel Island up until about 3,500 years ago. The only argument directed against all these correlations is that of radiocarbon dating. This, as has been shown, has been culled to support the 10,000 year mammoth extinction but, on the basis

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<sup>699</sup>See, Pielou, *After the Ice Age*, *op. cit.*, p. 194.

of hiphothermal warming for the release of carbon dioxide and methane, shows radiocarbon evidence is well in agreement with Velikovsky's scenario.

On the other hand, the uniformitarians and catastrophists who advocate a 10,000 year extinction must invent one ad hoc hypothesis after another to support their time-line explanation of these events. They must either assume that megaherbivores could live in a tundra type biome which, as has been amply demonstrated, will not support them, or they must invent a totally imaginary environment called a mammoth steppe that has never been known to exist, and is contradicted by the fundamental findings of pollen evidence. They have to assume that the temperate types of plants and animals living to the south of the tundra presently, lived farther north during the Ice Age. They have to suggest as a reality that while the rest of the Earth became cooler during the Ice Age, the arctic region at the same time became warmer. They have to invent ad hoc processes to make the tundra bloom like a grassland all in the name of their uniformitarian dogma.

And I stress that the basis of all their understandings, analyses, and evaluations of the evidence is based entirely on uniformitarian thinking. What Sutcliffe, Lister, and all the other authorities cited above, be they paleontologists, paleoecologists, palynologists, taphonists, geologists, anthropologists, and the like, have in common is a blind allegiance to uniformity as expounded by Lyell over 150 years ago. Uniformitarianism's greatest exponent and most influential spokesperson today, George Gaylord Simpson, reaffirmed this philosophy as the only tool for all research in his essay, "Uniformitarianism: An inquiry into principles, theory, and method in geohistory and biohistory," in *Essays in Evolution and Genetics*, (New York, 1970). Shipman summarizes it thus:

"In using uniformitarianism to explain events that have already occurred taphonists and paleoecologists must follow three logical steps [outlined by] (Simpson 1970): (1) Obtaining and ordering the historical data; (2) DETERMINING WHAT PROCESSES ARE OPERANT IN THE PRESENT AND HOW THEY PRODUCE [THESE] EFFECTS; (3) CONFRONTING THE HISTORICAL RECORD WITH [APPLICATION OF] THE KNOWLEDGE OF PRESENT PROCESSES."<sup>700</sup> (Capitalization added)

All scientific analyses and interpretations of the evidence have not only been employed to reinforce and support the uniformitarian paradigm of the mammoth extinction by all the disciplines, but the possibility of recent major catastrophes in the geohistorical and biohistorical record has been systematically excluded. As a result of this blinkered approach to the evidence, what we have witnessed is that "the present is the key to the past" interpretation, as has been repeatedly shown above and will be shown below, has been responsible for the creations of contradictions and fictions. The interpretations available to uniformitarian researchers is anything goes, as long as it is one form or other of gradualism and not major catastrophism.

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<sup>700</sup>Shipman, *Life History of a Fossil*, *op. cit.*, p. 12.

Bibby, in describing the large numbers of mammoth bones found at Predmost, Czechoslovakia discusses the work of Japetus Steenstrup, who advanced the view

“ . . . that a whole herd of mammoth had, at some period of maximal glaciation, been overwhelmed by an avalanche in the mountain passes of Moravia and had been frozen in, only to be discovered thousands of years later by man. The Predmost camp [found there] would, thus, be a settlement set up by primitive man to take advantage of this colossal, natural cold-storage deposit.

“The theory could not stand against the force of facts. Further excavations revealed the remains of over nine-hundred mammoths, as well as a considerable number of other arctic species. A natural catastrophe on such a scale could not be postulated.”<sup>701</sup>

As one can see, huge catastrophes are excluded *a priori* based on a uniformitarian definition.

For a thoroughly uniformitarian sketch of these fictions presented about the Beringian mammoth and its demise, see the chapter, "Matriarch, The Woolly Mammoth," in James A Michener's book, *Creatures of the Kingdom*, (New York, 1993). Here one will find much of the accumulated, gradualist vision paraded as fact regarding this extinct animal and its environment in a work of fiction (supposedly based on science) by a fiction writer who is imbued with the uniformitarian line. However, Shipman presents the following caveat regarding uniformitarian theory:

"It should be clear that a single set of evidence can be interpreted in several different ways. More important, if only the interpretation is given, it is easy to assume the existence of certain types of supporting evidence that do not in fact exist."<sup>702</sup>

Much, if not most, of my criticism of the uniformitarian school's interpretations stated above stems directly from evidence which indicates that the supporting evidence regarding the gradualist thinking and interpretation of this extinction simply does not exist. As a point of consideration, let us examine the following statement by Shipman:

"A population that died through [uniformitarian] attrition mortality will show high death rates in the most vulnerable groups (the very old and the very young) and lower rates in the less vulnerable age groups. On the other hand,

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<sup>701</sup>Bibby, *The Testimony of the Spade*, op. cit., p. 131.

<sup>702</sup>Shipman, *Life History of a Fossil*, op. cit., p. 16.

when a catastrophe such as a flood, drought, disease, epidemic, or volcanic eruption strikes down many or all members of a *local population* (catastrophic mortality), the preserved remains of the population will reflect the total age structure of that group in life. The assemblage will probably show large members of young individuals, and decreasing members in each successive age class."<sup>703</sup> (Emphasis added)

Shipman's very definition of a catastrophe makes it uniformitarian by defining it as a "local" catastrophe; see how major catastrophes are denied by definition. However, Stephen Jay Gould states that the issue of a uniformitarian or catastrophic interpretation ". . . must be settled by scientific study (observation and inference), not by *à priori* definition."<sup>704</sup> But Sanderson points out that this definition does not apply by pointing to the population distribution of mammoths together with other animals and trees across Alaska, Siberia, and other regions, as well.

"A particularly odd feature of these preserved masses is that *they contain specimens of all ages, from infants, the immature, and adolescents to the mature in the prime of life and the old and senile*. Most of them are grossly mutilated: nay, rather literally torn apart—and to tear apart a large Abu [elephant] requires almost unimaginable power.

"The muck of Alaska, as washed out by gold-mining outfits using high-pressure hoses is in many places choked also with masses of bits of mammoths and other animals such as Woolly Rhinoceros, giant lions, bison, wolves, and *beavers*, and also pieces of large tree trunks. . . . The same goes for huge areas of Siberia. These are not just bits of rotten or rotting corpses; they are bits of fresh bodies literally torn apart. And the whole lot, along with vegetable matter, silt, boulders, and all manner of other detritus are piled together, higgledy-piggledy, in one great sort of pudding, often for mile after mile.

"This is no normal process of 'fossilization.' It can only be the result of special events."<sup>705</sup> (Emphasis added)

In this respect, Haynes cited Howorth on the types of animals that became extinct: "Animals do not die naturally in crowds when young, and yet we find [fossilized] remains of quite young animals abounding in all classes from Mammoths to mice."<sup>706</sup>

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<sup>703</sup>*Ibid.*, p. 18.

<sup>704</sup>Stephen Jay Gould, *Dinosaur in a Haystack*, (New York, 1995), p. 168.

<sup>705</sup>Sanderson, *The Dynasty of Abu*, *op. cit.*, p. 80.

<sup>706</sup>H. Howorth in Haynes, *Mammoths, Mastodonts & Elephants*, *op. cit.*, p. 111.

Not only do we find specimens of all ages of one organism, as clear evidence of a catastrophic phenomenon demanded by Shipman and other uniformitarians, but we also find, over vast areas, masses and bits of all sorts of other extinct and extant mammals and tree pieces mixed together. Now what force will smash a tree to ribbons and do the same for animals all across the arctic basin. This broad contradiction to the "local" catastrophe concept exists over thousands upon thousands of miles of this region. This cannot be the result of unique isolated burials or local catastrophes. Let us examine this further.

If the burials were unique isolated events there would remain only a few bones of one species in any individual spot. If there was an isolated catastrophe affecting a herd of animals, then they would represent, by and large, the overwhelming fossils or fossil bones found together. But local catastrophes do not allow for the mixed burial of whole populations of diverse fauna and flora smashed to pieces over vast regions. For the local catastrophe to be the proper explanation one would expect to find such mass burials only very randomly scattered in a very few areas. It should not generally be the rule over a vast region. Add to this that gradual bone burials would be destroyed by solifluction lobes and we arrive at a uniformitarian explanation that lacks credulity.

In this regard, the debate over the dinosaur extinction well applies to that of the megafauna. Ward asks, "if they were suddenly killed off by . . . [catastrophic] effect . . . where are the bodies? Such a catastrophe, the argument goes, would surely leave great piles of bones,"<sup>707</sup> Yet all across the Arctic basin and in various places all over the world are bone beds of diverse mammals. While paleontologists demand extensive bone beds over broad areas as evidence of global catastrophic extinction, they simply ignore or reinterpret the clear evidence of catastrophic extinction found for the megafauna mammals.<sup>708</sup> Again, the theory of uniformity defines the evidence in one and only one way, to deny a great, recent catastrophe.

But even evidence from trees and peat beds found submerged on continental shelves below the present-day sea level further points to a global catastrophe at the end of the hypsithermal. All over the Earth, submerged forests are found covered by ocean deposits. According to Dunbavin these submerged forests and peat beds found across the Earth show that

"The submerged forests and peat-beds offer an even greater argument in favour of rapid [catastrophic] changes in sea level. J. A. Steers, [*The Coastline of England & Wales*, (Cambridge, Eng., 1964)], remarks that all such peat and forest beds are very thin and must result from a sudden submergence beneath sea level, to be rapidly covered up by protective sand deposits. Any other [gradualist] scenario would allow the living matter to decompose in the normal way. The preservation of the beds must also imply that the extent of the sudden

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<sup>707</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 51.

<sup>708</sup>*Ibid.*, p. 52.

submergence was greater than the tidal range; otherwise, the soft material should have been long eroded away by the waves."<sup>709</sup>

Thus, as with the Arctic, where the authorities say that to bury untold numbers of animals and trees the burial must be rapid and catastrophic, with the submerged forest and peat-beds on the ocean shelves we are again informed that the burials must also be rapid and hence catastrophic. That is, both on land and sea, these fossil materials across the globe demand catastrophic burial. Although both types of burial are assumed not to be simultaneous, the dating of submerged and emerging shorelines has been inordinately difficult to obtain.<sup>710</sup>

To quote Howorth:

"However ingeniously and with whatever subtlety we may deal with our evidence, the facts constrain us, therefore to one inevitable conclusion, namely, that the Mammoth and its companions perished by some wide-spread catastrophe which operated over a wide area and not through slow processes of the ordinary struggle for existence, and that the greater portion of the remains we find in Siberia and Europe are not the result of gradual accumulation under normal causes for untold ages, but the result of one of Nature's hetacombs on a grand and wide-spread scale, when a vast fauna perished simultaneously."<sup>711</sup>

Even William Smith, the English engineer, who presented the first analysis that certain fossils were always associated with various sedimentary rock layers as a tool for understanding, the geological column, in a broadsheet published in 1835 entitled *Deductions from established facts in geology*, suggested that an episode of sudden freezing was evidenced by "an entire elephant preserved in the ice of Siberia."<sup>712</sup>

Cuvier was emphatic, based on the evidence of his geological and paleontological research, that the last of the great cataclysms had occurred in the time of human history.

". . . if there is any circumstance thoroughly established in geology, it is that the crust of our globe has been subjected to a great and sudden revolution, the epoch of which cannot be dated much farther back than five or six thousand years ago; that this revolution has buried all the countries which were before

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<sup>709</sup>Dunbavin, *The Atlantis Researches*, *op. cit.*, pp. 67-68.

<sup>710</sup>M. Eronen, "Late Weichselian and Holocene Shore Displacement in Finland," *Shorelines and Isostasy*, D. E. Smith and A. G. Dawson, eds. (New York, 1983), pp. 183-184.

<sup>711</sup>Howorth, *The Mammoth and the Flood*, *op. cit.*, p. 183.

<sup>712</sup>F. J. North, "Deductions from established facts in Geology," by William Smith, *Geological Magazine*, Vol. 64, (1927) in Claude C. Albritton, Jr., *The Abyss of Time*, (New York, 1984), p. 115.

inhabited by men and by the other animals that are now best known; that the same revolution had laid dry the bed of the last ocean, which now forms all the countries at present inhabited; that the small number of individuals of men and other animals that escaped from the effects of that great revolution, have since propagated and spread over the lands then newly laid dry; and consequently, that the human race has only resumed a progressive state of improvement since that epoch, by forming established societies, raising monuments, collecting facts, and constructing systems of science and of learning."<sup>713</sup>

And as long ago as the last century, the cause of the extinction was laid to catastrophe by others. J. C. Warren, in 1855 wrote, "The cause of the disappearance of the mastodon seems to be mysterious. We are . . . disposed to believe that an animal of so great a size, and of so great a strength and such extensive distribution . . . must have required some great and general catastrophe to overwhelm and annihilate it."<sup>714</sup> Haynes looking at extinction over a hundred years later was forced to admit that,

"Clearly something exceptional happened at the end of the Pleistocene."<sup>715</sup>

While Stephen Jay Gould speculates "Suppose that all extinctions, not just mass dyings, but even minor removals in local areas, are caused by impacts of varying sizes, what would the history of life look like then? Does the actual history of life look like this after all?"<sup>716</sup>

An excellent example to delineate this recent catastrophic event is the African Cheetah, the American Cheetah had become extinct.<sup>717</sup> If nearly every single cheetah had been killed off during the recent catastrophe proposed by Velikovsky, except a few or one pregnant female, this would be found in a lack of variability in the genetic makeup of all subsequent crosses of the species. According to Elizabeth Pennisi, "molecular biologists drove . . . [the] point home with compelling data showing that wild . . . cheetahs have no more genetic variability than highly inbred strains of laboratory mice."<sup>718</sup>

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<sup>713</sup>*Ibid.*, pp. 135-136.

<sup>714</sup>J. C. Warren, *The Mastodon Giganteus of North America*, (Boston, 1855), p. 224.

<sup>715</sup>Haynes, *Mammoths, Mastodonts & Elephants*, *op. cit.*, p. 283.

<sup>716</sup>Stephen Jay Gould, "Introduction," in David M. Raup's *Extinction: Bad Genes or Bad Luck*, (New York, 1991), p. xvi.

<sup>717</sup>Krishtalka, *Dinosaur Plots*, *op. cit.*, p. 205.

<sup>718</sup>Elizabeth Pennisi, "Cheetah Countdown," *Science News*, Vol. 144, (September, 25, 1993), p. 200.

Timothy M. Caro, has looked at all the possible uniformitarian causes for this and concluded that "the causes of cheetah's reduction of genetic variability in the Pleistocene remains an open question."<sup>719</sup> About a year or so ago, I saw a video presentation respecting this question of cheetah genetics and the narrator's remarks which I very roughly paraphrase say *it is as though a pregnant female cheetah woke up one morning and found she was the only surviving one on Earth*. It is as if an immense catastrophe killed off every other cheetah. According to Caro:

"Back calculation based on relative divergence of m+DNA [mitochondrial DNA] in felids [cats] and mutation rates of variable number of tandem repeat loci in other species place the last bottleneck [reduction of cheetah population] at the end of the Pleistocene between 6,000 and 20,000 years ago."<sup>720</sup>

This, of course, is an estimate, and using other slightly different "variable numbers" would reduce the time of the bottleneck. But without question, this evidence of cheetah genetics is in full congruence with Velikovsky's thesis. Caro admits that "population size can also be reduced . . . as a result of . . . catastrophe. . . ." <sup>721</sup>

Cardona vibrantly concludes his own discussion of the broadly geographic nature of this mass extinction and its exceptional catastrophic nature:

"In both Siberia and Alaska the signs of destruction are more than apparent. In Alaska, multitudes of trees are found 'twisted and torn' and 'piled in splintered masses.' Mammal remains—mammoth, mastodons, bison, horses—are found *dismembered and torn*, but with portions of ligaments, skin, hair, and even flesh, *still intact and fresh*, all mingled with the splintered remains of this mighty forest . . . the permafrost in which this destruction is entombed *does* contain 'great quantities of volcanic dust and debris.' In fact, four separate layers of volcanic ash sandwiches the entire mess.

"In Siberia it is exactly the same. Petrified forests in an uprooted condition but with some trees still *in situ*, bituminous trunks and fossilized charcoal, are everywhere intermingled with petrified ash, and veins of ice, and sand that has turned into sandstone. And among this colossal devastation are found the [shattered] skeletons of mammoths, rhinoceroses, bison, and horses.

"If this is not a picture of catastrophe, *what is?*

"What sort of tempest uprooted the trees? Whence the fire that carbonized them? What force tore and dismembered those thousands of beasts? What water deposited the sand? And whence the ice that covered them all?

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<sup>719</sup>T. M. Caro, *Cheetah of the Serengeti Plains*, (Chicago, 1994), p. 355.

<sup>720</sup>*Ibid.*, p. 353.

<sup>721</sup>*Ibid.*, p. 354.

" . . . [Although] the few quasi-intact mammoth carcasses so far discovered do not constitute the rule. They are, on the contrary, the exceptions representing those few individuals who, through the vagaries of chance, managed to escape. We can only learn so much from their remains. But we can learn an awful lot more from whatever is left of the hundreds of thousands of their slaughtered kin and the jumbled destruction amid which their remains are found."<sup>722</sup>

Ward believes that the catastrophe that exterminated the Pleistocene megafauna occurred over a period of about 2,000 years driven by human predation. Nevertheless, this statement by him can be interpreted as a vastly more rapid celestial event.

“Cuvier believed that the world of Ice Age mammals had ended in catastrophe. He had ample reason for this judgment. Having seen, in rock outcrops in regions near Paris how abruptly the Cretaceous Period seemed to have ended, he came to believe that the Age of Dinosaurs had been brought to a close by some catastrophic event. He was among the first to recognize this. He and I have walked the same French outcrops and seen the same strata, and I have come to the same conclusion that Cuvier held to his dying day: Mass extinctions, whether among dinosaurs or Ice Age mammoths, can *only* occur through sudden rare, and highly unlikely catastrophes.”<sup>723</sup>

One of the ways of getting around the finds of mammoth and other animal bone deposits all over Alaska and the Yukon of Canada is to say that they were drowned in local catastrophes. but this is sheer invention since it is well-known that caribou, as they migrate onto and away from the tundra, must cross raging rivers, and they do drown in large numbers. According to Bourlière: "When certain streams are crossed [by caribou] mass drowning can occur, as witness one mentioned, . . . that resulted in the death of 525 animals."<sup>724</sup> Since Alaskan and Canadian river valleys are filled to great depth with the millions upon millions of bones of extinct mammals, where are the millions upon millions of bones of caribou in the sediments on top of these extinct creatures? Where are their bones found shattered into fragments with sinews and flesh in the latest sediment over these vast areas? Of course, here or there they might be found, but not torn apart with smashed and broken trees. They have drowned by the hundreds and thousands, year in and year out, for over 10,000 years; at the very least they should be found across the vast wastes of these regions in new sediments with smashed bones by the millions. But this is in no way the case.

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<sup>722</sup>Dwardu Cardona, "Comments," *KRONOS*, Vol. VII, No. 4, (Summer 1982), pp. 88-89.

<sup>723</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, p. 47.

<sup>724</sup>Bourlière, *the Natural History of Mammals*, *op. cit.*, p. 205.

What the uniformitarians want is to suggest invented local catastrophes to explain the heacombs of extinct mammals in these regions, but then are oblivious to what must ensue with the caribou, which is not found; with smashed fragments of their bones on top of those of the Pleistocene over immense regions. In fact, the numbers of caribou drowning compared with what one would expect from elephants, that are great swimmers, suggests that their bones should outnumber those of the mammoth beneath them. Why hasn't this uniformitarian process occurred if the catastrophes were only local?

On the most fundamental level, this evidence is not faced by the uniformitarians, as Deloria also points out.

"We find the missing megafauna of the late Pleistocene in the Siberian islands, in the islands north of Alaska, and in the muck in the Alaskan interior. Obviously, we have here victims of an immense catastrophe which swept continents and left the debris in the far northern latitudes piled in jumbled masses that now form decent-sized islands. Most anthropologists avoid discussing these deposits because the orthodox uniformitarian interpretation of the natural processes precludes sudden unpredictable actions."<sup>725</sup>

D. S. Allen and J. B. Delair, in positing a catastrophic extinction similar to that of Velikovsky, ask:

". . . what agency other than extremely violent wind could have brought together in one place such dissimilar avian species as the following? They included: Grebes, herons, bitterns, storks, wood ibises, spoonbills, swans, various geese, (including the snow goose, ducks, American vultures, kites, many kinds of hawks, falcons, eagles, caracaras, the *Teratornis*, quails, cranes, partridges, turkeys, rails, gallinules, parrots, coots, plovers, turnstones, woodcock, snipes, surf-scooters, stilts, sandpipers, barn owls, seven other owl species, flycatchers, woodpeckers, swallows, jays, crows, magpies, titmice, chickadees, ravens, mocking birds, waxwings, thrashers, meadowlarks, shrikes, two species of blackbird, redwings, orioles, finches, sparrows and buntings. Remains of all these birds were discovered in the late Pleistocene tar-seeps at McKittrick in California, and the asphalt pits at Rancho La Brea in the same state.

"This extraordinary assemblage is not an isolated, freak occurrence."<sup>726</sup>

The researchers go onto show that birds are found in other areas in deposits with camels, bison, and ground sloth.

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<sup>725</sup>Vine Deloria, *Red Earth White Lies*, (New York, 1995), p. 136.

<sup>726</sup>D. S. Allen, J. B. Delair, *When the Earth Nearly Died*, (Bath, Eng., 1995), p. 59.

The history of catastrophists who concluded that the mammoths of the far north were destroyed by a catastrophe is a long and distinguished one containing other names such as J. D. Dana, F. C. Hibben, A. d'Orbigny, and probably many, many others unknown to this author.

They all deserve a place in science for drawing the correct conclusion of cataclysm as a process inherent to the geological history of the Earth; and Velikovsky stands towering among them.

His own description in *Earth in Upheaval* sums up his evidence thus:

“The extermination of great numbers of animals of every species, and many species in their entirety, was the effect of recurrent global catastrophes. Of some species every animal was exterminated in one part of the world, but a number of animals succeeded in surviving in another part of the world; so the horses and camels of the Americas were destroyed without a survivor, yet in Eurasia, though decimated, they were not exterminated. But many species were completely extinguished, in the Old World as well as in the New—mammoths and mastodons and others. They expired not because of a lack of food or inadequate organic evolution, inferior build or lack of adaptation. Plentiful food and superb bodies and fine adaptation and solid procreation, but no survival of the fit. They died as if a wind had snuffed life out of all of them, leaving their cadavers, with no signs of degeneration, in asphalt pits, in bogs, in sediment, in caverns. Some of the decimated species probably endured for a while, possibly for several centuries, being represented by a few specimens of their kind; but in changed surroundings, amid climatic vicissitudes, with pastures withered, with plants that had served as food or animals that had served as prey gone, these few followed the rest in a losing battle for existence, surrendering, at last, in the struggle for survival of a species.”<sup>727</sup>

The overwhelming strength of this global, catastrophic evidence suggests in powerful terms that something overwhelmed the Earth. As Darwin, himself a uniformitarian, was forced to admit when he looked at the devastation in South America, and asked,

“What, then, has exterminated so many species and whole genera? The mind, at first, is irresistibly hurried into the belief of some great catastrophe; but thus, to destroy animals, both large and small, in Southern Patagonia in Brazil, on the Cordillera of Peru, in North America up to Behring's Straits, we must shake the entire framework of the globe.”<sup>728</sup>

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<sup>727</sup>Velikovsky, *Earth in Upheaval*, *op. cit.*, p. 232.

<sup>728</sup>Charles Darwin, *Journal of Researches into the Natural History and Geology of Countries Visited During the Voyage of the H.M.S. Beagle Round the World*, (London, 1834), pp. 169-170.

But Darwin was under the influence of Lyell's theory of gradualism and he wrote "Everything about which I thought or read [in Lyell] was made to bear directly on what I had seen or was likely to see and this habit of mind was continued during the five years of the voyage."<sup>729</sup> The turning away from this straightforward understanding of catastrophe that seemed to make so much sense to Darwin was subsumed under the rule of uniformitarianism. Lyell, Darwin, and the succeeding scientists of the 19th and 20th centuries said catastrophes were only an appearance and not the reality. This disjuncture between what they all clearly saw as catastrophe, and what they then concluded was gradualism, has done a great disservice to science in the sense that the vast bone beds of the arctic are still interpreted as only single or local events.

In order to fathom the depth of the animosity that modern science still harbors toward the view that the mammoths were destroyed by a global catastrophe, I note that in *Pleistocene Extinctions*, (1984), edited by Martin and Klein, an introductory essay by Donald Grayson reviews nineteenth century scientific research on this subject. Grayson, in his desire to give the impression that by the end of the century there was no scientist of stature who upheld and presented evidence of catastrophism regarding this matter, omitted the 1887 monumental research of Henry H. Howorth's *The Mammoth and the Flood*. As one can see even today, history is being fabricated and rewritten to distort, suppress, and propagate only one view of this recent extinction. Although the Russians mention him and his work, even his name has also been omitted from the Index.

One researcher reports on the matter thus:

"When in 1830 Charles Lyell set out to slay catastrophism, what he laid in the grave with a stake through its heart was already a ghost. His act of exorcism, however, was so convincing that for many geologists the word catastrophism was forever blasphemy. . . .

"Uniformitarianism has been the subject of much exegesis since then, but catastrophism was permanently relegated to the history of science as an experiment that failed."<sup>730</sup>

However, Richard Leakey, the son of the famous paleontologist, Louis Leakey, and Roger Lewin respond:

"The recognition that mass extinctions play so vital a role in shaping Earth history was important in the development of evolutionary theory. The notion that these events may be extraterrestrial . . . is truly compelling. We are forced to leave behind a Darwinian world that is shaped by forces we can

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<sup>729</sup>Henshaw Ward, *Darwin and the Theory of Evolution*, (New York, 1943), p. 76.

<sup>730</sup>Tjeerd H. Van Andel, *New Views on an Old Planet: A History of Global Change*, 2 ed., (Cambridge, Eng., 1994), p. 397.

understand and identify with our daily existence, and accept one that is the hapless victim of a fickle universe. Gone is an image of the flow of life as smooth and predictable, with humans its inevitable culmination; its replacement is a world that is erratic and unpredictable, and in which our place is achieved through a large slice of luck. *Catastrophism is back with us, and it is real.*<sup>731</sup> (Emphasis added)

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<sup>731</sup>Richard Leakey, Roger Lewin, *The Sixth Extinction*, (New York, 1995), p. 229.

## POLESHIFT

"The [English] poet John Milton was aware that humankind suffers through winters because of the tilt of Earth's axis. He assumed this tilt to be part of the general planetary decline that ensued when the first man and woman were expelled from the Garden of Eden. An angry God, Milton wrote in *Paradise Lost*, 'bid his angels turn askance the poles of Earth twice ten degrees and more from the Sun's axle. . .'"<sup>732</sup>

"Nor can we accept the idea that the Earth's axis of rotation, the axis that determines the climatic zones, was differently aligned in the past than it is now. . . . The tilt of the axis of rotation cannot have altered by any appreciable margin since the time of formation of the Earth."<sup>733</sup>

If, as Velikovsky maintained, there was a poleshift<sup>734</sup> [with a great, sudden, tectonic, crustal shift] which ended the Ice Age 8,500 years ago, and to others which created the present climatic regime about 3,500 and 2,800 years ago, fundamental forms of evidence should systematically support this conclusion. If the period of the hipsithermal dates between 8,500 and 3,500 B.P., is in agreement with this claim, then meteorological evidence related to atmospheric wind patterns and rainfall should be systematically and symmetrically arranged on Earth to support this poleshift concept. Phytogeography, or plant geography, related to the new climatic regime, should also be systematically and symmetrically arranged on the globe to fit this plate tectonic poleshift. The climatic and plant geography of the entire Earth should exhibit a distribution that would naturally follow if the rotational poles of the Earth were much more perpendicular to the plane of the ecliptic. However, if Velikovsky's concept is in error, then about 8,500 years ago, even with a period of greater warmth, there should have been very little change in the entire Earth's climatic regime and plant zones should have all reflected this. As we will see, Velikovsky's concept is strongly corroborated by the evidence and the established theory against a plate tectonic poleshift is strongly contradicted by this

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<sup>732</sup>Jonathan Weiner, *Planet Earth*, (Toronto, 1986), p. 122.

<sup>733</sup>Sir Fred Hoyle in Donovan A. Courville's, *The Exodus Problem and its Ramifications*, Vol. II, (Loma Linda, Calif., 1971), p. 44.

<sup>734</sup> John White, *Poleshift, op. cit.*, pp. 53-64, for a broad view of the scientists on this topic.

evidence. Henceforth, I will use the term poleshift to denote both a sudden, large plate tectonic shift with a geographical poleshift. How much each contributed to the changes in climate and meteorological patterns cannot yet be assessed.

The problem for the beginning and ending of the Ice Age, like that of the Pleistocene extinction, is still unknown and highly controversial. This is admitted by several scientists who have devoted their lives to Quaternary research. For example, Flint states, "Let us admit at once that we do not know what are the basic causes of climate change. Although nearly 150 years [now 175 years] have elapsed since the Glacial Theory was proposed, the causes remain elusive."<sup>735</sup>

Sutcliffe remarks, "There is still no basic theory as to why climate changes. . . . We are in the same stage as pre-Newtonian astronomy: we observe phenomena but we have not worked out laws to explain them."<sup>736</sup> There will follow a fuller discussion of this problem in the next chapter.

Therefore, given this conclusion, it seems an appropriate approach to the problem to examine the evidence for a poleshift. The idea of a poleshift is really not new. In the last century, Julius Hann claimed,

"The simplest and most obvious explanation of great secular changes in climate and of former prevalence of higher temperatures in northern circumpolar regions, would be found in the assumption that the Earth's axis of rotation has not always had the same position as a result of geological processes."<sup>737</sup>

Howorth cites Sarytchef on the ability of mammoths to survive in Siberia: "I am rather inclined to attribute the phenomenon to some extraordinary change in the globe . . ." <sup>738</sup> Therefore, if Velikovsky is correct, there should exist evidence which shows that the pole shifted 8,500 years ago, but more importantly, that it shifted 3,500 and 2800 years ago as well, and that the period of the hypsithermal gives clear evidence that this is exactly what occurred. C.E.P. Brooks makes this fundamental observation which relates to the solution of this problem:

"So long as the axis of rotation remains in nearly its present position relative to the plane of the earth's orbit around the sun, the outer limit of the atmosphere in tropical regions must receive more of the sun's heat than the middle latitudes, and the middle latitudes more than the polar regions; this is an

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<sup>735</sup>Richard Foster Flint, *Glacial and Quaternary Geology*, (New York, 1971), p. 789.

<sup>736</sup>Schultz, *Ice Age Lost*, *op. cit.*, p. 200.

<sup>737</sup>W. B. Wright, *The Quaternary Ice Age*, (London, 1937), xxv + 478, p. 313.

<sup>738</sup>Howorth, *The Mammoth and the Flood*, *op. cit.*, p. 72.

invariable law. . . . it is much more difficult to think of a cause which will raise the temperature of the polar regions by some 30F. or more, while leaving that of the equatorial regions almost unchanged, and so bring about an approach to the distribution of climate zones during the warm periods."<sup>739</sup>

This is the very same point Lyell raised when he suggested the climate had been more hospitable in the arctic for mammoths to live there, and is the same concept behind the mammoth steppe which attempts to accomplish this warm climatic condition. Even Benjamin Franklin, looking at the evidence, conceived that a poleshift was necessary.

"It is remarkable that elephants now inhabit naturally only hot countries where there is no winter, and yet these remains are found in a winter country; and it is no uncommon thing to find elephants' tusks in Siberia, in great quantities, when their rivers overflow, and wash away the earth through Siberia is still more a wintry country than on the Ohio; *which looks as if the Earth had anciently been in another position and the climates differently placed from what they are at present.*"<sup>740</sup> (Emphasis added)

Silverberg comments that Franklin, "offers one brilliant suggestion far ahead of his time, when he says that perhaps the world once was tipped at a different angle on its axis so that lands now arctic were tropic then. . . ." <sup>741</sup>

Even Georges-Louis Leclerc, better known as *Comte de Buffon*, in his fifth supplementary volume of his encyclopedic *Natural History* titled *Epoques de la Nature*, (The *Epochs of Nature*) published in 1778, maintained that the Earth was warmer when "mammoths and rhinoceroses were early inhabitants . . . These large beasts were adapted to higher temperature than their modern counterparts could endure, and so they disappeared when the temperature fell below a point they could tolerate."<sup>742</sup>

Sanderson, in 1962, puts the case for a shift of some kind even more emphatically.

"Astronomers tell us that the presence of polar caps (as well as of the tropic, and the general zoning of climates all over the Earth) is due to this planet's axis of rotation being set on an angle of 23° to the plane along which it travels around the sun. This tilting results in alternating periods of lack of sunlight at the

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<sup>739</sup>Brooks, *Climate Through the Ages*, *op. cit.*, p. 31.

<sup>740</sup>Silverberg, *Mammoths, Mastodons, and Man*, *op. cit.*, p. 61.

<sup>741</sup>*Ibid.*

<sup>742</sup>Claude C. Albritton, Jr., *The Abyss of Time*, (New York, 1986), p. 83.

North Pole at one time of the year. . . . Thus, if the northern polar cap moved south to, say, Hudson Bay, the southern polar cap must have moved out into the southern Pacific Ocean. This would mean the deglaciation of Antarctica's ice-cap and reciprocally, the unfreezing of the Arctic Ocean ice-raft. . . .

"This presents a pretty picture. On the one hand, *we have definitive proof that the poles several times recently were not where they are today*; and, on the other, we apparently have just as cogent [an] argument that they could *not* [based on the fact that poleshifts are considered impossible] have moved! . . . By the same token, if there were periods when the earth got so hot (over-all) that there were no polar caps, everything outside of them would have boiled . . . So if the poles cannot move, and yet they did so, what are we to suppose? There is only one remaining alternative: The skin of the Earth moved in parts or as a whole."<sup>743</sup> (Emphasis added)

Leaving aside a probable gyroscopic destruction of the Earth by a poleshift and probably correlated to it a sudden plate tectonic motion, we must still explain the evidence for the ancient climate which Lyell suggested "the temperature of winter and summer were [more] equitable."

If the rotational poles of the Earth were moved toward the perpendicular of the plane of its orbit around the Sun by one degree, the frigid zones would each shrink in size from the temperate zones by one degree. The torrid zone would also shrink at its north and south extremes by one degree, while the north and south temperate zones would expand both to the north and to the south by these two degrees removed from the frigid and torrid zones. The frigid and torrid zones would shrink to expand and broaden the temperate zones. Therefore, the more perpendicular the poles are, the larger or broader the temperate zones become at the expense of the torrid and frigid zones. The seasonal variations at the polar regions must become less extreme because they then receive more sunlight throughout the year and more direct sunlight. The northern temperate areas that have expanded will have warmer winters for just this reason, while at the temperate areas that expanded toward the equator, just the opposite will occur; that is, their summers will become cooler. This is just what will create, as Lyell suggested—more nearly equalized climate over the Earth.

Importantly, the Earth will still be receiving exactly the same amount of sunlight overall, but the distribution of that solar energy will be more equitably spread than at present. This is, in fact, a well understood datum with respect to past climates. According to John Gribben, "past climates differ from today's climate more in terms of spacial patterns of temperature and atmospheric circulation than in terms of global mean temperature."<sup>744</sup> When geophysicist Wallace Broecker was asked about an overall global warming of 2.5 degrees Celsius, he said that "there may never have been a time that

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<sup>743</sup>Sanderson, *The Dynasty of ABU*, *op. cit.*, pp. 67-68.

<sup>744</sup>John Gribben, *Future Weather and the Greenhouse Effect*, (New York, 1982), p. 231.

warm, at least in the last few million years."<sup>745</sup> These statements make it clear that the overall temperature of the Earth has been relatively constant but that the zonal distribution of the Earth's temperature was distributed differently. This, as Sanderson suggested, can only have occurred because of a poleshift or plate tectonic motion or both together.

Sir Henry Howorth long ago outlined the clue by which to explain and examine this question:

"The flora and fauna are virtually the only thermometer with which we can test the climate of any past period. Other evidence is always sophisticated by the fact that we may be attributing to climate what is due to other causes. But the biological evidence is unmistakable; coldblooded reptiles cannot live in icy water; semitropical plants whose habitat is the temperate zone, cannot ripen their seeds and sow themselves under arctic conditions."<sup>746</sup>

Dunbavin explains:

"In recent decades, much evidence of Holocene climatic history has been accumulated from the study of ancient pollen. . . . The sequence of changes in the vegetation cover has been derived from analysis of the pollen preserved in the layers of ancient peat bogs. . . .

"If in one layer we find that deciduous trees were the dominant vegetation, then it can be assumed that the climate was temperate and wet. If the layer immediately above is dominated by grasses than this probably indicates a transition to a drier climate. If the layer above that contains predominantly evidence of coniferous forests, then this would indicate a move to colder climate."<sup>747</sup>

The point presented above regarding the plants that lived in the arctic found in the stomachs of mammoths were indicators that the mammoths ate grasses that grew in the temperate zone. According to Peter James the "vegetation in its [a mammoth's] stomach was of a type that now grows in latitudes some 20 to 30 degrees warmer than present-day Siberia."<sup>748</sup>

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<sup>745</sup>*Ibid.*, p. 230.

<sup>746</sup>Henry Howorth, *The Glacial Nightmare and the flood, II*, p. 427, cited in Alfred M. Rehwinke, *The Flood*, (St. Louis, Mo. 1951), p. 7.

<sup>747</sup>Dunbavin, *The Atlantis Researches, op. cit.*, p. 86.

<sup>748</sup>Peter James, *Earth in Chaos*, (Brisbane, Australia, 1993), p. 122.

There is one further point related to all this. As was pointed out earlier, the oceans were warmer in the polar regions as well as in the temperate latitudes. But with the tilt of Earth's axis of rotation, more perpendicular to the plane of the ecliptic, the torrid zone would shrink and ocean water in this zone would thus also be somewhat warmer than at present.

There is a phenomenon known as "El Niño," the little boy. It is created in a vast region of the southeastern Pacific Ocean by unusual heating of the waters of that area. The water migrates eastward heating the air masses above it as it travels and brings tremendous rainfall to regions where these air masses, laden with water vapor, pass over the land and thus they cool, condense, and drop their moisture. California, during such El Niño episodes, suffers so much precipitation that it has enormous numbers of mudslides. Winter snows in the central Rocky Mountains and spring rains in these regions cause the Missouri, Ohio, and Mississippi Rivers to create devastating floods.

But during the hipsithermal, there would have been continuous El Niños not only in the Pacific Ocean, but also in the Atlantic and Indian Oceans, as well, creating rainy conditions all across the Earth on the continents, promoting great growth of vegetation and trees.

Thus, we come to the hipsithermal again and the distribution of climate regimes as it relates to a poleshift. A poleshift, as was pointed out, not only warms up the arctic regions, but also cools down and expands the more equatorial range of the temperate region. Therefore, what must we expect if the hipsithermal period was the result of a poleshift which enlarged and expanded the temperate zone? What must follow from such an arrangement of the Earth's axis is that temperate vegetation would migrate into the arctic, as that found in the Beresovka mammoth, but that temperate vegetation at the same time would migrate toward the equator into the present torrid regions, and specifically, into the deserts which straddle the meeting point between the temperate and torrid zones. Temperate vegetation requires a temperate climate, rainfall, and seasonal variation of sunlight and, therefore, its migration both northward and southward several hundred miles, up to a thousand miles at the same time along the same longitudes absolutely requires, nay demands, a poleshift!

It has been amply documented above that, during the hipsithermal, the forests and grasses of the north temperate zone extended much farther northward all across the arctic. What must now be demonstrated is that temperate flora also migrated south at the very same time into the desert regions.

These desert areas of the Earth are presently located between 15 and 30 degrees latitude with most large deserts located in the northern hemisphere. It is to the northern hemisphere of the Earth that I will concentrate the presentation of evidence; but the same can also be found in the southern hemisphere. As pointed out, these desert areas overlap the torrid and temperate zones.

Let us recall, as pointed out earlier, that elephants were hunted for their ivory tusks all through the periods of Egyptian and Mesopotamian civilization. Elephants had been able to live and find forage all across the Near East during that time. But according to the historians, the only way these civilizations, especially the Mesopotamians,

flourished was through extensive irrigation. They suggest that the Near East was a desert. But, although elephants can survive in near desert conditions, herds necessary to supply the ancient world with ivory could not do so. How could the Near East and North Africa supply ivory to the civilized nations of that period if these regions were deserts? This suggests that the deserts of these more northern regions disappeared more slowly than the more southern areas and the lakes and streams there provided sufficient water for vegetation and water to drink for the elephant herds. It further suggests that, in the more distant periods of these civilizations, there was plenty of rainfall to allow for sufficient forage for these elephant herds in the lands that are now deserts.

According to *The Cambridge History of Africa*, during the hypsithermal, the Sahara Desert was green and suitable for man and all types of animals. This is shown, in part, by rock drawings of elephants, antelope, giraffe, and humans hunting these animals. Other drawings show man herding flocks of cattle, sheep, and goats. Radiocarbon charcoal from the ancient campfires of these people places them in the fourth millennium B.C. or 6,000 years ago.<sup>749</sup> Given the analysis of radiocarbon above, this date may be a thousand to two thousand years closer to the present. However, the types of trees that migrated into the Sahara were dicotyledons. According to Howorth, in the Sahara, "from a great bed of travertine, covering a stretch of 300 metres, (about 1,000 feet] near the oasis of Chargueh, which contains the leaves of dicotyledons and the stalks of grasses, proving the former existence of a rich vegetation in a place now absolutely void of water."<sup>750</sup> Other trees also grew in the Sahara. Goran Burenhult, in discussing the Sahara of the post-glacial hypsithermal, claims "In most valleys the vegetation consisted namely of cedar, cypresses, oaks, and walnut trees . . ."<sup>751</sup> "Walnut trees are common throughout the deciduous forests of the eastern United States and in part of eastern Asia. In Mexico and Central America, they are only locally common in certain canyons in the mountains or in fog belts on the slopes of mountains. One species . . . occurs in only one valley in Costa Rica."<sup>752</sup> It is necessary to stress that for walnut trees to grow, in the Sahara the weather must be much cooler and there must be much more rainfall. According to the Britannica, just cited, walnut trees do not naturally grow in North Africa. But there is much more data regarding other temperate to subtropical tree types that also grew in the Sahara during the great post-glacial warm era. According to Silverberg,

"There is no doubt that the Sahara of 5,000 B.C. [7,000 years ago] was a green and pleasant place, at least in comparison to what it is today. Pollen grains

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<sup>749</sup>*The Cambridge History of Africa*, Vol. I, (Cambridge, Eng., 1981), p. 562.

<sup>750</sup>H. Howorth, *The Mammoth and the Flood*, *op. cit.*, p. 153.

<sup>751</sup>Goran Burenhult, "Rock Art in the Central Sahara," *People of the Stone Age*, Vol. II, Goran Burenhult ed., (New York, 1993), p. 56.

<sup>752</sup>*Encyclopedia Britannica, Macropedia*, Vol. 10, (Chicago, 1982), p. 329.

from strata that can be dated to that time show evidence of lotus, hackberry, tamarisk, wild olive, cypress pine, and evergreen oak. The stumps of ancient sycamore and acacia trees still rise from the sand in what now is lifeless desert west of the Nile. In the Air highlands of the southern Sahara there stands a living olive tree more than twenty-five feet in diameter. It may be as old as three or four thousand years, and [at that high elevation where the climate is cool] is the lone survivor of what formerly was an extensive grove."<sup>753</sup>

The age of this tree is estimated to be between three and four thousand years which implies that the climate of the Sahara Desert changed after that time or during the period Velikovsky presented for a major tilt of the Earth's axis. As we will see below, according to Henri Lhote, this flora was a Mediterranean type. That is, he claims it presently grows around the Mediterranean Sea. However, the Britannica states: "Commercial olive products [from olive trees] occurs in two belts around the world, between 30° and 40° north latitude and 30° and 45° south, where the requirements for growth and fruitfulness can be found."<sup>754</sup> Olive trees could not have grown in the Sahara Desert 7,000 to 3,000 years ago unless there was not only greater rainfall but cooler seasonal conditions typical of the temperate zone between 30° and 40° north latitude. That corresponds to the latitude between Jacksonville, Florida and Philadelphia, Pennsylvania or between Alexandria, Egypt and Bucharest, Romania. The temperate zone had moved about 15 degrees south or a distance of approximately a thousand miles.

According to David Attenborough, at the time that the Sahara Desert was green,

"Amazingly, one living organism has survived from that time. In a narrow rock-walled gorge stands a group of ancient cypress trees. Judging from the number of rings in their trunks, they are between 2,000 and 3,000 years old. . . . Their thick, twisted roots have pushed their way through the sun-riven rocks . . . as they have groped downwards for underground moisture. Their dusty needles manage somehow to be green. . . . Their branches still produce cones with viable seeds within them. But none germinate. The surrounding land is simply too dry."<sup>755</sup>

These trees apparently were among the last seedlings to germinate in the Sahara. Today, however, cypress trees are "distributed throughout warm-temperate and subtropical regions of Asia, Europe, and North America."<sup>756</sup> Cypress trees growing in

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<sup>753</sup>Robert Silverberg, *The Challenge of Climate*, (New York, 1969), pp. 156-157.

<sup>754</sup>*Encyclopedia Britannica, Macropedia*, Vol. VII, (Chicago, 1982), p. 52.

<sup>755</sup>David Attenborough, *The Living Planet*, (New York, 1984), p. 141.

<sup>756</sup>*Encyclopedia Britannica, Macropedia*, Vol. III, (Chicago, 1984), p. 325.

the heart of the Sahara 5,000 years ago requires that these trees migrated well south beyond their present geographical borders.

Henri Lhote lists several types of trees that grew in the Sahara which "include conifers (e.g., Aleppo pine and cypress); arbor vitae; nettle-tree; holm-oak; lentiscus; maple; alder; lime, and olive, that is to say a flora of Mediterranean type."<sup>757</sup> All these trees are found around the Mediterranean Sea, several hundred miles to over a thousand miles north of where they grew in the Sahara.

In addition, "the surface of the Sahara is strewn in places with milling and grinding stones from the New Stone Age. . . . biologists and scientists who study fossil pollens believe that the stones were used solely to grind wild grain-like grasses"<sup>758</sup>

Velikovsky further pointed out the rock drawing found in the Sahara also contained depictions of "extinct animals" as exhibited in P. Leclerc's book, *Sahara*, (1954), p. 46 and in I. Frobenius and Douglas C. Fox's book, *Prehistoric Pictures in Europe and Africa*, (New York, 1937), p. 38.

Elsewhere we learn that on the rock drawings of the Sahara "some of the animals and birds depicted are long extinct,"<sup>759</sup>

When, then, did the Sahara dry out?

"The flourishing of late prehistoric cultures in the Sahara was originally made possible when the monsoon rains expanded far northwards—as we know they did from the evidence of the areas' former lakes and stream-fed marsh regions. Conditions began to be more moist around 10,000 B.C. and were substantially wetter for most of the time between 7,000 and 2,000 B.C. The lakes reached their maximum extent about 3,500 B.C. For unknown reasons, however, monsoon rains began to diminish over the Sahara and an irreversible imbalance between rainfall and rate of evaporation eventually took place."<sup>760</sup>

Elsewhere Lhote describes the catastrophic nature of the change in climate that overtook this entire region.

"To sum up: the present desert character of the Sahara appears to be a comparatively recent phenomenon whose onset dates after 2,000 B.C. The process was, it seems, rapid—and that in itself is astonishing. What were the

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<sup>757</sup>Henri Lhote, "The Fertile Sahara," *Vanished Civilizations*, (New York, 1963), p. 31.

<sup>758</sup>"When the Sahara was Green," *Readers Digest, The World's Last Mysteries*, Pleasantville, N.Y., 1978), p. 207.

<sup>759</sup>Henri Lhote, "When the Sahara was Green," *op. cit.*, p. 249.

<sup>760</sup>*Ibid.*, pp. 206-207.

reasons for it? All the supposed explanations put forward up to now are just so many unfounded theories. Why should the Sahara which, four thousand years ago, got sufficient rain to afford water for countless flocks and herds, receive today only a few showers barely enough to keep a few camels alive?

"Here we get lost in a maze of conjecture. so rapid a change of climate is almost inconceivable."<sup>761</sup>

Lhote goes on to say, "The rock-engravings and paintings cover the whole of this period. It must have lasted for about 5,000 years."<sup>762</sup> This places this period of cooler climate and rainfall in the Sahara clearly in the period of 8,500 to 3,500 or to 3,000 years ago. There is one further point that Lhote makes with respect to when the Sahara Desert was still green and, therefore, received temperate type rainfall. It was well into historical times because horse driven chariots are well depicted as well as men riding horses.

"The arrival of the horse marks an important turning-point in Saharan history and we have plenty of evidence relating to this event, including some fine paintings whose style indicates a definite change due to the invasion of new people. These men and women wore bi-triangular tunics, drawn in at the waist, or bell-shaped skirts. The horses are shown harnessed to two-wheeled war-chariots. Arms and armour were javelins and round shields, . . ."<sup>763</sup>

Hence, these drawings of fairly advanced civilized men and women and chariots indicate quite clearly that the Sahara desert was green well into historical times, which means that the sudden climate catastrophe also occurred in historical times.

If this is the case, then this climate catastrophe should have left unmistakable evidence in Egypt itself to show that during a long period of time there was plentiful rainfall on that civilization. This evidence is clearly observed on the Sphinx on the Giza Plateau. This was outlined by Joseph Davidovits and Margie Morris.

". . . geological studies of the sphinx have kindled more than debate over . . . [its] attribution and age. The established history of the evolution of civilization has seen challenged.

"A study of the severe body erosion of the Sphinx and the hollow in which it is situated indicates that the damaging agent was water. A slow erosion occurs in limestone when water is absorbed and reacts with salts in the stone. *The controversy arises over the source of the vast amount of water responsible.*

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<sup>761</sup>Henri Lhote, *Vanished Civilizations, op. cit.*, p. 32.

<sup>762</sup>*Ibid.*, p. 12.

<sup>763</sup>*Ibid.*, p. 31.

"Two theories are popular. One is that the ground water slowly rose into the body of the Sphinx. This theory produces irreconcilable problems: A recent survey carried out by the American Research Center in Egypt (ARCE) determined that three distinctly separate repair operations were completed on the Sphinx between the New Kingdom and Ptolemaic rule, that is, during the period of roughly 700 to 1,000 years. The study also indicates that the Sphinx was already in its current state of erosion when these early repairs were made. No appreciable erosion has occurred since the original damage. . . .

"Knowing this, one must consider that the inundating Nile slowly built up levels of silt over the millennia, and that this was accompanied by a gradual rise in the water table. During Khafra's time the water table was about thirty feet lower than it is today. For the rising ground water theory to hold, an unbelievable geological scenario would have to have taken place. It would mean that from thirty feet lower than today's water table, water rose to about two feet into the body of the Sphinx and the surrounding hollow, where it caused erosion for roughly 600 years, and then stopped its damaging effects.

"Historians find the second theory . . . offered more unthinkable. It suggests that the source of water stemmed from the wet phases of the last Ice Age—c. 15,000 to 10,000 BC—when Egypt underwent periods of severe flooding."<sup>764</sup>

Various individuals and groups have taken angry sides in this debate, but the points to be discussed about this evidence are significant. Not only is the base of the Sphinx water eroded, but so, too, was the entire body and the nature of the erosion is that of rainfall and not sand erosion.

Sand creates a particular form of erosion which is also exhibited on the Sphinx. Rainfall, on the other hand, tends to run off monuments along grooves and low points on them and erodes these channels every time it rains. The Sphinx distinctly exhibits this kind of gullying erosion.

Graham Hancock explains that Robert Schoch presented this fact in the 1992 convention of the Geological Society of America and then:

"Schoch went on to explain his findings to a much wider and . . . eclectic audience (including Egyptologists) at the Annual Meeting of the American Association for the Advancement of Science (AAAS). He began by pointing out to delegates that 'the body of the Sphinx and the walls of the Sphinx ditch were deeply weathered and eroded. . . . It's very deep, it's very old, in my opinion, and it gives a rolling and undulating profile.'

"Such undulations are easily recognizable to stratigraphers and paleontologists as having been caused by 'precipitation-induced weathering.' As Santha Faiia's photographs of the Sphinx and the Sphinx enclosure indicate, this

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<sup>764</sup>Joseph Davidovits, Margie Morris, *The Pyramids: An Enigma solved*, (New York, 1988), p. 21-22.

weathering takes a distinctive form of a combination of deep vertical fissures and undulating, horizontal coves—‘a textbook example,’ in Schoch's words, ‘of what happens to a limestone structure when you have rain beating down on it for thousands of years. . . . It's clearly rain precipitation that produced the features’.”<sup>765</sup>

Therefore, we have evidence that for about 600 years, during the time of ancient Egyptian civilization, there was abundant rainfall which deeply eroded the Sphinx. What no one has understood is that the long period of rainfall in the Sahara during the hipsithermal also occurred in Egypt and damaged the Sphinx.

Corliss corroborates this with evidence of the level of Lake Moeris in Egypt.

“. . . the Egyptians built a quay on Lake Moeris, which then had an elevation of 66 feet above sea level and was located 7-1/2 miles southeast of . . . [a stone] quarry. (The lake is now much smaller and 148 feet **below** sea level, indicating a large climate change.)”<sup>766</sup>

That is, we have clear evidence that the level of Lake Moeris in ancient times was much, much higher than at present. This is a direct form of evidence that proves rainfall in Egypt was much greater, and then the region became arid.

Therefore, we have shown that during civilized historical times, there was much rainfall in the Sahara which continued into the period when chariots were driven and people wore civilized clothing, and that this rainfall also damaged the Sphinx.

This is further corroborated by Moses B. Cotsworth whose, *The Rational Almanac*, privately was printed in York, England in 1920, who examined the Sphinx, and showed:

"It has repeatedly taken several hundred men several years to clear the sand from its base and revealed a six-tiered obelisk against its chest (now missing), . . . Each time the base was cleared, windstorms filled it in again with sand, indicating that when the Sphinx was originally built the Sahara was almost certainly not a desert.”<sup>767</sup>

One of the great pyramids on the Giza Plateau still retains its facing stones at the summit, but these do not show water damage from rainfall which suggests that it was

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<sup>765</sup>Graham Hancock, *Fingerprints of the Gods*, (New York, 1995), p. 421.

<sup>766</sup>William R. Corliss, *Ancient Infrastructure*, (Glen Arm, Md., 1999), pp. 327-328.

<sup>767</sup>Peter Tompkins, *Secrets of the Great Pyramids*, (New York, 1972), P. 142.

built long after the Sphinx and after the climate changed. Furthermore, none of the many ancient monuments and temples in Egypt exhibit this form of rain damage, which further suggests that in Egyptian civilization, these were built after the climate changed, about 3,500 years ago. In fact, the lack of rain damage on many of the exposed rock monuments all across the African-Asian continent indicates that these great civilizations built many of their great edifices after about 3,500 years ago and indicates the history of the ancient world does not go back as far as has been proposed.

If the earliest era of Egyptian history falls inside this pluvial period, then the Nile River should exhibit much higher flood stages than that of later Egyptian times. It has long been known that the ancient Egyptians made careful measurements of the floods that annually inundate the Nile River valley. According to B. Bell, in her discussion of "The Oldest Records of the Nile Floods," as found on hieroglyphic inscriptions from the Fifth Dynasty, the Palermo Stone shows that the Nile River floods were much higher and also much more erratic than later records indicate.<sup>768</sup>

Velikovsky also pointed to this evidence.

“K. R. Lepsius observed that the Nilometer at Samneh, . . . show an average rise in the waters of the Nile at that place, where the river is channeled in rock twenty-two feet higher than the highest level of today. ‘We obtained the remarkable result that about 4,000 years ago [based on accepted chronology] *the Nile used to rise at that point on average twenty-two feet higher than it does at present.*”<sup>769</sup> (Emphasis added)

Where did an average of twenty-two additional feet of water come from, year in and year out, in Egypt's early history? Velikovsky ascribed it to “either . . . a change in the quantity of water in the Nile or to a change in the rock structure of Egypt.”<sup>770</sup> It seems clear that the greater quantity of water in the Nile may be ascribed to the period when rainfall caused the Sahara to bloom.

This is ascribed by Robert Claiborne to the hipsithermal.

"There is good reason to believe that during the Climate Optimum the Nile flowed more vigorously. In part, this was probably due to heavier rains in the Ethiopian and Central African highlands, which now supply nearly all the river's water, but also in part to run-off from adjacent parts of the Sahara, which

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<sup>768</sup>B. Bell, "The Oldest Records of the Nile Floods," *Geogr. J.*, Vol. 136, (1970), pp. 569-573.

<sup>769</sup>Velikovsky, *Earth in Upheaval*, *op. cit.*, p. 191; see also, K. R. Lepsius, *Letters from Egypt, Ethiopia, and the Peninsula of Sinai*, (1853), pp. 19-20.

<sup>770</sup>*Ibid.*, pp. 191-192.

reached the Nile through *wadis* (arroyos) now dry for all, or nearly all, the year."<sup>771</sup>

This is precisely what one would expect if rainfall was greater, namely that yearly rainfall would create higher spring floods than usual, as they do in the temperate zone, but also that floods could occur at earlier and later periods when winter or summer rains were unusually heavy. It also is in agreement with the size and depth of ancient Lake Chad and the many great rivers that flowed across the Sahara during that pluvial period.

According to Oard,

"The eastern Sahara is now known to have been well-watered not very long ago. New technology allows radio-wave observations through the dry, featureless sand of the desert. . . . Scientists were amazed to find an old drainage network, with some [river] channels as large as the Nile River Valley. Most amazing of all, the eastern Sahara Desert now receives rain at any one locality only once every 30 to 50 years! Fossils of many animals have been discovered, including the elephant, hippopotamus, buffalo, crocodile. . . . Some of these animals are aquatic, implying very wet conditions. This wet climate occurred rather recently, as suggested by degenerate crocodiles that still survive in isolated western Sahara lakes. . . .

"Needless to say, pluvial lakes and well-watered deserts are difficult to explain on uniformitarian principles. Flint admits the serious problem of explaining the quantity of rain needed to satisfy the geological observations."<sup>772</sup>

Gustav Schenk describes the pictures in the Sahara thus:

"The grandiose frescos show in colours which are today still fresh and undisturbed: gods and goddesses, demons and spirits, hunters, dancers, swimming, and running people with their hunting animals, giraffes, ostriches, antelopes, mouflons [a wild sheep now found on Corsica and Sardinia], hippopotamuses and elephants, light reed boats, men swimming and the species of animals bear witness to the fact that the stony wilderness must at one time have been fertile land. The central Sahara was then a well-populated and densely settled region with well-watered and fertile valleys and meadows. Even now, the ancient beds of streams, rivers, and brooks can be recognized which at one time watered the present desert region in a gigantic network."<sup>773</sup>

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<sup>771</sup>Robert Claiborne, "How Has Climate Affected History?" *Mysteries of the Past*, Joseph J. Thorndike, Jr., ed. (New York, 1977), p. 240.

<sup>772</sup>Michael J. Oard, *An Ice Age Caused by The Genesis Flood*, (San Diego, 1990), pp. 78-80.

<sup>773</sup>Gustav Schenk, *The History of Man*, (Stuttgart, Ger., 1961), p. 163.

If, as is suggested here, the Sahara dried up rapidly in historical times, the people living there would have had to migrate to regions with water. Karl Butzer states,

"There appears to have been a general exodus from the Libyan Desert in 5th and 6th Dynasty times, represented by the (Temehu) Libyans and the Nubian C-group, a feature apparently associated with the abandonment of many Neolithic sites in the Sahara and the impoverishment of the Savanna Fauna of the rock pictures [based on the established chronology] . . . . A pronounced reduction of rainfall and pasturage in Egypt and the Libyan Desert quite certainly took place after 2400 B.C. from all considerations of the evidence."<sup>774</sup>

Barbara Bell correlates this desiccation also with the fifth and sixth Egyptian Dynasties. "The specter of famine first clearly appears toward the end of Dynasty V, when a well-known relief from the causeway of the Pyramid of Unis depicts a group of severely emaciated people, evidently dying of hunger."<sup>775</sup> Bell then discusses the Ipuwer Papyrus as evidence of societal collapse in the wake of the catastrophe, which makes perfectly good sense in terms of Velikovsky's thesis that the underpinnings of Egyptian society fell apart and a starving people seeking for their needs broke all laws to fulfill those needs and desires. That is, there is good evidence that in Egypt for a long period of time there was abundant rain which ended with catastrophic suddenness.

But today, this region of the Sahara is described by Schenk as:

". . . a gloomy and often almost inaccessible country. This dead and silent mountain range with columns, precipices, eroded rock bastions, with thousands of cavities and ravines, seems to have been lifeless. . . . The Tassili-n-Ajjer . . . presents a terrible view from the air: The mazes of jumbled rocks are weathered so regularly that they resemble gigantic but deserted blocks of houses with a network of exactly divided streets which no longer belong to any earthly region. It is a nightmare picture of a strange constellation in which nothing exists which can be compared in the remotest degree to anything on Earth."<sup>776</sup>

According to Lamb, based on the established chronology,

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<sup>774</sup>K. W. Butzer, *Quaternary Stratigraphy and Climate in the Near East*, (New York, 1958), p. 117.

<sup>775</sup>Barbara Bell, "The Dark Ages in Ancient History," *American Journal of Archaeology*, Vol. 75 (1971), p. 5.

<sup>776</sup>*Ibid.*, p. 159.

"The archaeological excavations at Ur, Kish, Fara, and Nineveh have given clear evidence of breaks in the stratification caused by flooding episodes, all dated between 4,000 and 3,000-2,400 B.C. [6,000 to 4,400 years ago]. In the fourth millennium B.C. there was a considerable spread of settlement in the Sinai Peninsula again indicating the exceptional moisture of those times. . . ."777

According to J. Otterman, Israel was not a desert 6,000 years ago but was a land richly covered with vegetation.<sup>778</sup>

Therefore, if there was a climate change in that region around 1,500 B.C., there would be a record of the change from historical documents showing an earlier rainy climate to one which was drier. This would be reflected in the onset of the growing season. The older growing season would begin earlier and after about -1,500 it would begin later. This indeed appears to be the case. The following, however, is based on the accepted ancient chronology:

"Another type of record of the early historical period are the inscriptions on Babylonian tablets during two periods: 1,800 to 1,650 B.C., and 600 to 400 B.C. Ninety tablets dated to the latter period give an indirect indication of the time of the barley harvests. Barley was used as currency in exchange for goods; the tablets detail who paid how much barley during what transaction. Interest rates, names of witnesses and the reigning king, and the date and place where the deal was made are all included on the tablets.

"Tablets for the earlier Babylonian period (1,800-1,650 B.C.) reveal the harvest dates more directly; they include receipts for harvest work done on a certain day. Also recorded were receipts for advance payment for harvest work. Hence, researchers can compare the harvest dates of these two periods with each other and with those of the present. Providing there has been no significant change in the time barley varieties need to mature. . . .

"Israeli researchers Jehuda Neumann and R. Marcel Sigrist have deduced from the tablets that the harvest during the period from 1,800 to 1,650 B.C. began late in March or early in April; [implying earlier spring-light and earlier rainfall] during the newer Babylonian period 600 to 400 B.C., it began about one month later [late April/early June implying later spring-light and later rainfall]. It is known that today, in what was once central and northern Babylonia, and is now Baghdad, harvest begins in the second half of April."<sup>779</sup>

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<sup>777</sup>H. H. Lamb, *Climate History and the Future*, *op. cit.*, P. 388-389.

<sup>778</sup>J. Otterman "Anthropogene impact of the albedo of the earth," *Climate Change*, Vol. I, (1977), pp. 137-156.

<sup>779</sup>Schneider, Londer, *The Coevolution of Climate*, *op. cit.*, p. 108.

What Neumann and Sigrist suggest, based strictly on uniformitarian grounds, is that the older period was moderate and the later one less so. However, seed germination is largely based not only on temperature and moisture, but also on photoperiodic day-night times. These photoperiods, as well as rainfall evidence, suggests earlier rain and an earlier spring. This is just what would follow from a pole orientation which was more perpendicular. There would be during the older period earlier warmth, rainfall, and spring-light and, during the more recent period, later warmth, rainfall, and spring-light. Schneider and Londer suggest that a month is simply too great a difference in time to be explained by ordinary phenomena. They do say the change was due to climatic conditions.<sup>780</sup>

Albright was no less surprised to discover that in the present desert of east Jordan, distant from any source of irrigation, at Ghassul, there had to have been rainfall to irrigate crops.

"It would be interesting to know what were the changes in climate which led to the abandonment of site like Ghassul, situated far out in the Jordan plain where the soil could not be irrigated without prohibitive effort. It seems reasonably certain that there were more lateral streams flowing into Jordan than there are today . . ." [which implies greater rainfall].<sup>781</sup>

But in eastern Jordan there was also found buried in sand a bronze age city of 100,000 square meters presently named Jawa. Sven W. Helms, from the Institute of Archaeology in London, who excavated the city, claims,

"Now, at last, there is sufficient evidence to state categorically that a large, permanent, nomadic population dwelled there [in Jordan] . . . after about 8,000 B.C., right up to the creation of Jawa."<sup>782</sup>

There are rock drawings, like those in the Sahara of herds of cattle.<sup>783</sup> According to the preliminary study, sheep made up 86.7 percent of the livestock, cattle 8.5 percent, horses 2.1 percent.<sup>784</sup>

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<sup>780</sup>*Ibid.*, p. 109.

<sup>781</sup>W. F. Albright, *The Archeology of Palestine*, (London, 1960), p. 69.

<sup>782</sup>S. W. Helms, *Jawa Lost City of the Black Desert*, (Ithaca, N.Y., 1981), pp. 26-27.

<sup>783</sup>*Ibid.*, p. 27, 28, 29.

<sup>784</sup>*Ibid.*, p. 249.

"The structure of the Black Desert [of Jordan] precludes access to ground water and springs are very rare indeed. It will seem that only water derived from the brief winter rains could transform this bleak land momentarily into a life supporting environment."<sup>785</sup>

Helms has concluded that winter rain was stored behind a dam that allowed this city to exist. But the forms of crops grown, as pointed out by Albright, require rain, and Helms admits after listing the various crops that grew, that "This group of crop plants could only have been grown at Jawa under present conditions in a year of exceptionally favourable rainfall. . . ."<sup>786</sup> What this explanation fails to do is explain how in advance of the growing season could the people of Jawa know that there would be "exceptionally favourable rainfall"? Since this could never have been forecast, it is evident, as Albright pointed out, that other sources of water are required, which certainly suggests higher rainfall.

To the southeast of Israel lays the Arabian Desert, one of the most forbidding regions on Earth. Yet Velikovsky reports:

"In the southern part of the great Arabian Desert, ancient ruins, almost entirely obliterated by time and the elements, and vestiges of cultivation are silent witness of the time when the land there was hospitable and fruitful; it was copiously watered and luxuriously forested as India on the same latitude. Orchards covered Hadhramaut and Aden. It was a land of plenty, paradise on Earth, but following a sudden catastrophe, Arabia Felix turned to barren land."<sup>787</sup>

A. O. Kelly also describes the Arabian Desert when it was watered.

". . . the September 1983 issue of *Smithsonian* carried an article on the recent archaeological discoveries in Saudi Arabia that point to . . . a changed climate. [It states] ' . . . Lost in the wastes are cities with defense walls and towers, elaborate palaces with murals and shrines of forgotten gods. There are still-sturdy dams across now-dry streams and networks of stone-lined cisterns and canals that once served [water to] fields of grain, herds of sheep and the need of the slowly moving caravans'."<sup>788</sup>

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<sup>785</sup>*Ibid.*, p. 135.

<sup>786</sup>*Ibid.*, p. 247.

<sup>787</sup>Velikovsky, *Earth in Upheaval*, *op. cit.*, p. 97.

<sup>788</sup>A. O. Kelly, *Impact Geology*, *op. cit.*, p. 85.

To the east of Israel in Iran, which is a desert today, pollen derived from lake varves in the Zagros Mountains shows that the climate was cooler and wetter.<sup>789</sup> The flora that grew in the deserts of Iran were oak trees which had migrated into this region before 6,000 years ago. According to Lamb, there were widespread forests in the Thar desert of India and Pakistan which were sufficiently green and supported water buffalo and herds of elephant.<sup>790</sup> According to G. Singh, after the Ice Age ended as in the Sahara Desert, in the Thar Desert of India, rivers flowed.<sup>791</sup>

North of Iran where oaks grew is the southern European region of Russia, which contains two inland seas, the Caspian and the Aral. Sanderson describes this region which was once covered with forests thus:

"This basin is a thousand miles wide and a thousand miles long, and great parts of its land surface are below the level of the seas and oceans of the world. [Today] It is a desert, the whole eastern half being a cold, arid desolation in winter, a burning waste in summer. The remainder is covered by scrub of a most miserable nature composed of leafless, gnarled, and twisted bushes which bind the shifting sands. These deserts of southern Russia are perhaps the most frightful in the world, for not only does the temperature vary in the extreme, but the very earth itself is often either poisonous or covered by sheaves of salty clays. In consequence, huge areas are truly plantless and lifeless."<sup>792</sup>

In China as well, forests grew in the Gobi Desert.<sup>793</sup> Lamb as cited by Schneider and Londer, claimed that the Tarim Basin located in Sinkiang, China in central Asia, "was once dotted with cities, settlements, and forests. . . . Today, the area is mostly desert. (Interestingly, *tarim* means 'agriculture' in Turkish; central Asia was an ancient homeland of Turkic tribes."<sup>794</sup> The cities were really outposts of China along the Silk

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<sup>789</sup>Paul Dunbavin, *The Atlantis Researches*, (London, 1992), p. 91, as cited in H. E. Wright, Jr., (1966), at The International Symposium on World Climate.

<sup>790</sup>H. H. Lamb, "Climate vegetation and forest limits in early civilized times," *Philosophical Transactions of the Royal Society London, A*, Vol. 276, (1974), p. 203.

<sup>791</sup>G. Singh, "The Indus Valley Culture," *Archaeol. & Phys. Anthropol. in Oceania*, Vol. 6, No. 2, (1971), pp. 177-189.

<sup>792</sup>Ivan Sanderson, "European Russia," *Animal Tales*, (New York, 1946), p. 416.

<sup>793</sup>Lamb, *Philoso. Trans. of the Royal Soc. A*, *loc. cit.*

<sup>794</sup>Schneider, Londer, *The Coevolution of Climate & History*, (San Francisco, 1984), p. 102.

Road during the Han Dynasty when the region was a desert. The forests, however, were still standing long after the hipsithermal ended.

Sir Aurel Stein and Sven Hedin traveled into the Tarim Basin in the early part of the 20th century and reported these finds. Renewed interest in their discoveries grew when mummies of a nomadic people who lived in the great Taklamarkan Desert of the basin were presented to the world in the 1990s. These nomadic herders of the desert, according to Stein, were often found lying "in a wooden coffin of two long curved boards once covered with short planks."<sup>795</sup> Short, thick wooden planks lay above and beneath the body with long, thick, somewhat hollowed out planks enclosing the sides of the corpse. In addition, the graves were marked by a fairly thick wooden post set deep in the ground. Elizabeth Wayland Barber, in her fine book, describes these cemeteries thus:

"Upon filling in the [grave] pit, these early folk all over the . . . area marked the graves by erecting posts, so that their cemeteries came to look like small forests of poles. In fact, modern archaeologists know that they happened upon an ancient cemetery when they see what look like the weathered underpinnings of a giant wharf marooned in the desert. . . ."

"The most remarkable of these forests belong to a small series of strictly male graves. . . . Around these six male burials, the mourners drove dozens of good-sized logs vertically into the ground in seven tight concentric circles. The posts sit so close together that one cannot walk between them. . . . More wooden posts, further apart, stand in the ground in straight lines spreading out radially from the circle, like rays around a child's drawing of the sun. . . ."

"The shallow, salty sand into which the bottomless graves of commoners were dug, by contrast, sometimes sucked the moisture out of the inhumed bodies very quickly, thus mummifying and preserving many of them by completely natural means. . . ."

"But the logs tell a different story. For how could the ancient dwellers of . . . nearly four thousand years ago [which is radiocarbon dated to about 3,800 ± 95 years B.P.] have found so many good-sized trees to fell if this had been total desert in their day. Did they really drag both their dead and hundreds of large logs over vast distances just to bury them in this salty sand? It seems unlikely."<sup>796</sup>

Trees, especially large ones, require a good deal of rainfall to achieve decent sized girths, or must grow along the edges of fairly permanent lakes and rivers. However, if there was abundant rainfall, the bodies would have all been destroyed by bacterial decay. If the bodies were buried near river basins when these rivers became swollen, say from

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<sup>795</sup>Elizabeth Wayland Barber, *The Mummies of Urumchi*, (New York, 1999), p. 94.

<sup>796</sup>*Ibid.*, pp. 82-83.

snow melting in the distant mountains, they would have overflowed their banks and would have inundated the nearby graves, again causing the bodies to decay. Let us, then, accept that the rivers were distant enough from the graves to never affect the bodies. Does this resolve the problem? Again, the answer is no. If the forests grew along the rivers when the Tarim Basin was largely desert from snow melt in the distant mountains, the same snow melt should still occur and these rivers should still flow and have forests growing along their banks. There are trees around oases, but these, according to Barber, were not the source of the wood. She maintains they grew along rivers.<sup>797</sup>

The trees clearly were growing during the hypsithermal and died out as the region dried up and were left either standing or buried to be used by these nomads and later by the Chinese at their outposts along the Silk Road. Buried logs in the salty sands of the region were found to be in superb condition. This is proven by the fact that when the excavations of the graves were carried out,

" . . . just a couple of feet below the sand the archaeologists came across rush matting and wooden logs covering a burial chamber lined with mud bricks. [Victor] Mair [Professor of Chinese at the University of Pennsylvania] was surprised by the appearance of the logs: they looked as if they had just been chopped down."<sup>798</sup>

This grave was probably dug in Han times when outposts would have kept a large supply of water on hand for mud bricks to be made. Nomads don't generally make bricks.

The main point is that decent sized forests of dead trees can still be seen standing in this desert. In *National Geographic*, March 1996, p. 46, is apparently an aerial photograph of one of these forests showing upright trees still erect, in many cases with their branches. The trees can be seen going back to the horizon. Hedin had described one of these forests:

"How well I remember the broad, deep-dried-up-river-bed with the dead forest on its banks. there stood the trunks like the gravestones of a churchyard, gray, split, dried and as brittle as glass. Nothing living was to be found, nor a drop of water; a more God-forsaken region one could not imagine on the whole Earth. *More than fifteen hundred years ago a great stream had flowed through this furrow.*"<sup>799</sup>

The fact that ancient trees can survive for thousands of years in a desert raises a tremendously important point as it relates to radiocarbon dating. That is, as we go back

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<sup>797</sup>*Ibid.*, p. 93.

<sup>798</sup>Evan Haddingham, "The Mummies of Xingiang," *Discover*, (Apr. 1994), p. 76.

<sup>799</sup>Barber, *The Mummies of Urumchi*, *op. cit.*, p. 86-87. (Emphasis added)

in time, the condition of these trees had to be better and the farther back we go, their condition had to be much, much better.

Lamb informs us that

"Archaeological evidence from China, in particular a Neolithic village of Yangshao culture 5,000-6,000 years ago, apparently supported by many inscriptions on oracle bones from as late as the period 1,400-1,100 B.C., indicates . . . that through the warmest postglacial times the winter climate there was generally about 5°C [9°F] warmer than now, the whole year 2°C [3.6°F] warmer than now, rain was commoner than snow in winter, the various species of the natural fauna and flora ranged farther north than now, and crops like rice could be sown about a month earlier [similar to the harvest data of Babylon]."<sup>800</sup>

Again we have corroboration from crops in China and Babylon that the seasons were more moderate and wet, and that the growing season and harvest season came earlier. It is not feasible to expect barley in Babylon and rice in China to change their genetic make-up and thus to be planted earlier or to be harvested earlier than today. This again strongly suggests a major climatic change that made these regions moderate and wetter for many hundreds of years during their early history.

Chu Ko-Chen, in analyzing the evidence of the Yang-Shao culture, points out that the fauna that existed at Ban Po near Sian found in excavations, were subtropical animals that do not thrive in that far northern area, clearly showing that the climate was much warmer and more pluvial. These subtropical animals include water deer, tapirs, and bamboo rats. He also shows that these ancient Chinese people grew millet and vegetables, but not rice. Although millet can withstand drier and more variable seasonal climate conditions than rice, which grows only a little beyond the tropics, rice will only grow and thrive where there is a long, hot growing season.<sup>801</sup>

Chu Ko-Chen further suggested that the bamboo also migrated south after Yang-Shao times by some three degrees latitude or over 200 miles.<sup>802</sup>

Therefore, if China's climate changed in historical times about 3,500 years ago, and again about 2,500 years ago, historical records may indicate the type of change that occurred. K. A. Wittfogel, in analyzing the oracle bones from the Shang Dynasty, concluded that the climate of China was notably warmer during Shang times and notably cooler thereafter.<sup>803</sup> Again, the historical evidence corroborates the meteorological evidence regarding climate change.

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<sup>800</sup>H. H. Lamb, *Climate History and the Future*, *op. cit.*, p. 251.

<sup>801</sup>Chu Ko-Chen, *Scientia Sinica*, (May, 1973), pp. 226-228.

<sup>802</sup>*Ibid.*, p. 229.

<sup>803</sup>K. A. Wittfogel, "Meteorological records from Divination inscriptions of Shang," *The Geological Review*, Vol. 30, (1940), pp. 110-113.

In Japan, there is also clear evidence that the climate changed during the hipsithermal. Y. Ota and H. Machida, in discussing "Quaternary sea-level changes in Japan," claim that warm water mollusks migrated about 6° farther south or 420 miles around 3,000 years ago which suggests a change of 5° Celsius or 9° Fahrenheit.<sup>804</sup>

Sanderson describes the present condition of the Tarim and Gobi Deserts, once covered by trees and green pastures, as

"A tremendous pear-shaped mass of upland 1,700 miles in length from east to west and averaging 700 miles in width from north to south. Essentially, this is a tableland. . . .

"This tableland is a near desert, swept by icy blizzards, treeless, and to a great extent devoid of grass. . . . The most awful areas of desolation are at the western end of Tibet, where a little scrubby grass and a few crawling plants appear only along the borders of some small rivers."<sup>805</sup>

In describing the innumerable lakes that once dotted the present heartland of central Asia, Pfeffer shows:

"The Caspian [Sea] . . . continues to fall partly because the rivers that feed it do not make up for the vast evaporation of water. Countless salt lakes throughout the deserts of Central Asia share this fate, for most of the water carried into them by even the strongest rivers is lost through evaporation and through filtration into the sand.

"The topography of Caspian Turkistan is remarkable for its flatness . . . The entire plain is strewn with shallow basins and marshes, the remains of ancient salt lakes that are gradually drying up."<sup>806</sup>

All across the central Asian plateau are the remnants of lakes and rivers that flowed copiously during the hipsithermal, but are now drying up and disappearing leaving behind salt flats to mark places where once innumerable fresh water lakes once existed.

According to C. S. Scrivivasachari, as cited by Rehwinkle,

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<sup>804</sup>Y. Ota, M. Machida, "Quaternary sea-level changes in Japan," in *Sea-Level Changes*, M. J. Tooley, I. Shennan eds., (Oxford, Eng., 1987), pp. 211-213.

<sup>805</sup>Sanderson, *Animal Tales*, *op. cit.*, p. 373.

<sup>806</sup>P. Pfeffer, *Asia*, (New York, 1968), pp. 99-100.

"In India there is a . . . well-marked inland basin with clear evidence of having been filled with water at one time [probably during the Ice Age] . . . The Thar Desert in India, east of the Indus, really was traversed in prehistoric times by rivers and contained populous cities and villages. Relics of such cities are now being dug up."<sup>807</sup>

S. Piggot remarked upon the work of Sir Aurel Stein regarding widespread evidence of ancient man in Baluchistan and India:

"The abundant evidence of ancient occupation in the Baluchi hills [on the border of Iran and Pakistan] or the Indus plain implies less exacting climatic conditions in the past than at present, and through historical evidence implies that by the time of Alexander conditions in Baluchistan approximated to those of today, yet . . . there is good evidence for heavier rainfall and extensive forests in the Indus Valley in ancient times.

"It is less easy to find evidence of the former climate of Baluchistan than it is for the Indus Valley. Today the territories of Makran, Kharan and Jhalawan in South Baluchistan, which contain a large number of prehistoric settlements are very sparsely populated (not more than two persons to the square mile in Kharan), and this population is partly migratory.

"In his explorations in Baluchistan, these problems of climate and population were, of course, much before Sir Aurel Stein's eyes and he was able to identify a large series of artificial stone-built dams and terraces known locally in Jhalawan as *gabarbands* clearly designed to aid the irrigation of fields. The date of these is unknown but, as Stein remarks, they must reflect not only climatic conditions with a greater rainfall, but also a large population to provide the necessary labour for their construction. . . . Even though the age and culture of these works is still unknown, their presence is important in indicating greater rainfall in antiquity, . . . "<sup>808</sup>

In essence, during the agricultural period in Iran, there was abundant rainfall in northern India, Pakistan, and Iran.

Sanderson describes this region as the "desolate wastes at the borders of Afghanistan, Persia and Baluchistan" where oak forests grew where one [part of the country is] more awful than the other. In the west . . .

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<sup>807</sup>C. S. Scrivivasachari, *A History of India*, p. 5, in Alfred M. Rehwinkel, *The Flood, op. cit.*, p. 189.

<sup>808</sup>S. Piggot, *Prehistoric India*, (1961) in Donovan A. Courville's, *The Exodus Problem and Its Ramifications*, (Loma Linda, Calif., 1971), p. 159.

"There are [now] no forests or woods and only scattered bushes and dry tufts of grass on the plains, while the mountains are bare and rugged, . . .

"The other half . . . , lying to the north and east, is at a lower level and covered by extensive plains. Over these blow everlasting, dry winds so that vegetation is reduced to a minimum and great areas are covered by sandy wastes, salt tracts, and stony deserts. Here, only stunted, leafless, and prickly bushes dot the earth, interspersed here and there with little tufts of dry, wiry grass."<sup>809</sup>

In 1896, Sven Anders Hedin and a small party left an outpost of Khatan to search for an ancient city, Takla Makan in the Takla Makan Desert of the great Tarim Basin north of Kashmir and the Tibetan Plateau and south of the Tien Shan Mountains in western China. What he found was a land covered by sand dunes rising to a height of three hundred feet. After weeks of exploration the party came upon an entire "dead forest of sun-bleached, wind-scoured tree stumps protruding through the sand."<sup>810</sup> Near the forest they discovered human dwellings not made from mud bricks but wooden posts and walls of reeds covered over with clay which exhibited paintings of many colored murals of women in flowing garments and men with beards and mustaches. Among the murals were scenes of boats sailing across a vast lake. Digging around the town uncovered docks for boats and wood for keels. Hedrin wrote:

"Who would have imagined that in the interior of the dreaded Desert of Gobi, and precisely in that part of it which in dreariness and desolation exceeds all other deserts on the face of the Earth, actual cities slumbered under the sand, cities wind-driven for thousands of years, the ruined survivors of a once flourishing civilization."<sup>811</sup>

Radiocarbon dating the wood put the city back 5000 years ago in the hipsithermal.

Nigel Calder shows:

"Discoveries of fossil pollen showed that an area in north-west India at the edge of the Harrapan region, which is now arid, was formerly a land of rich vegetation.

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<sup>809</sup>Sanderson, *Animal Tales*, *op. cit.*, p. 405.

<sup>810</sup>*Alluring Target*, (Wash. D.C., 1996), p. 22.

<sup>811</sup>*Ibid.*, p. 23

"An expert in fossil pollen, Gurdip Singh, from the Institute of Paleobotany in Lucknow, investigated salt lakes in north-west India and found that they were formerly fresh-water lakes in the midst of richly vegetated land. The most interesting of the lakes is Lunkaransar near Bikaner, deep in the Great Sand Desert of Rajasthan. Here, today, the hot, moist wind of summer monsoon delivers scarcely any rain; instead it piles up drifts of sand and dunes [which] march slowly across the countryside. The vegetation is sparse. But dig just a few feet through the salt of Lunkaransar and you come to neat layers of mud, laid down when the lake carried fresh water four thousand years ago. And in the layers Singh found pollen of bulrushes and sedges. The lake also collected from the surrounding land, pollen of grass, jamun trees, mimosa and many other species. Jamun trees need at least 20 inches of rainfall a year. . . . Underneath [this layer] are the sand dunes of a fossil desert, it corresponds to the last phase of the most recent ice age . . . "812

The rainfall at this time was quite phenomenal. Brooks describes evidence of the former moister condition in northern India.

"E. J. H. Mackay . . . describing excavations at Mohenjo-Daro . . . states that about 2,750 B.C. culverts were specially constructed to carry away storm water, and between 2,750 and 2,500 the site was partially abandoned because of serious flooding by the Indus."813

The implication of this and the other evidence for India is that it enjoyed a typically temperate climate with much rainfall and a rich vegetation capable of supplying the harvest of large crops to feed a vast population. In fact, it seems there was so much rain that culverts were required to carry away the overflow and at times even these constructions were literally washed away by flood crests of the Indus River.

In fact, the water table was so high in Harappa that "in many of the houses [there were] . . . wells."814 Wells clearly suggest year round rainfall to maintain the height of the water table. More surprising is the evidence that water was so abundant in Harappan cities that the inhabitants used water to dispose of human waste from buildings.

"The most astonishing feature which makes Harappan cities almost unique in the pre-classical world of the ancient East, is the elaborate system of drainage and sanitation. Bathrooms are very much in evidence; there are latrines

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<sup>812</sup>Nigel Calder, *The Weather Machine*, (New York, 1974), p. 40.

<sup>813</sup>Brooks, *Climate Through the Ages*, *op. cit.*, p. 324.

<sup>814</sup>Will Durante, *Our Oriental Heritage*, (New York, 1954), p. 395.

with waste-channels leading to cess-pits which were evidently cleared by municipal workmen."<sup>815</sup>

Furthermore, some buildings in Harappa contained "bathing tanks."<sup>816</sup> In order to permit large cities to eliminate their human waste requires inordinate amounts of water, which suggests very large amounts of annual rainfall.

Silverberg informs us,

"The cities themselves tell of heavy rainfall, for they were built of brick—not the simple brick made of dried mud . . . but burnt brick, kiln-baked brick. This is a costly building material, and Harappa and Mohenjo-Daro are not small cities; each is more than three miles in circumference. The effort of producing kiln-baked brick in such quantity must have been tremendous, and can be justified only if the cities were subjected to torrential rains; for in a heavy downpour, sun-dried brick turns back to mud, but kiln-baked brick remains intact. The elaborate drains in the two cities seem intended to carry away rainwater running through the streets."<sup>817</sup>

To attempt to explain, for example, how these Indus people could find sufficient wood to produce the prodigious number of fired bricks for their cities, Walter A. Fairservice explored the possibility that riverine galley forests could provide sufficient timber to accomplish this end, suggesting the cities were rebuilt about every 140 to 150 years.<sup>818</sup> But this analysis is too conjectural at best to be accepted as fact.

Then, to feed a large population also requires plentiful rain, as we are told:

"The Harappans grew, among other crops, wheat and barley, peas, melons, and on some of the seals there are representations of what may have been banana trees. They were also [live] stock farmers raising sheep and cattle,

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<sup>815</sup>Creighton Gabel ed., *Man Before History*, (Englewood Cliffs, N.J., 1964), p. 97.

<sup>816</sup>Stanley Wolpert, *A New History of India*, (New York, 1982), p. 16.

<sup>817</sup>Silverberg, *The Challenge of Climate*, *op. cit.*, p. 182.

<sup>818</sup>Walter A. Fairservice, *The Roots of Ancient India*, (New York, 1971).

pigs, and goats. The camel appears to have been known, also the buffalo, the Indian bison, the bear, and spotted deer."<sup>819</sup>

The problem is how did the people of this region find sufficient water for their crops in a desert. According to the *Britannica Macropedia*, Vol. 1., (1982), page 329 at Harappa:

"It has been surmised, however, that the cereals could have been sown in the fall on inundated land after the annual flooding of the river had receded and then harvested in spring. The system is still in use and involves minimal skill, labour, and equipment. The land does not have to be plowed, fertilized, or irrigated."

Thus, like Egypt, the Indus River overflowed its banks and soaked the land with water and silt, making farming a relatively easy task. That is, as some now argue, Harappa civilization existed in a desert much as now, and that it received its water from snow melting in the mountains each spring and summer. This would certainly solve the water problem except for the fact that this region is now a desert. It receives about the same rainfall as it supposedly did during the heyday of Harappan society. The mountains to the north receive about the same snowfall as they did during that same heyday. That being the case, and some farming of areas that have this overflow do exist even today, why, then, did the civilization end? It still had overflowing rivers, according to this theory, and would, therefore, have been able to maintain a large population. The fact that this civilization came to an end related to a climatic change strongly implies that it was the climatic event that brought about its demise. There was no need, based on this scenario, for the population to migrate. Yet, that is just what occurred.

Was wood readily available for construction? According to Jonathan Mark Kenoyer,

"Some of the largest buildings at Mohenjo Daro and Harappa appear to have been made entirely of wood, and specialized tools would have been needed to shape and fit the huge timbers for gateways and columns. . . . Tropical hardwoods and aromatic cedar were used for buildings and furniture. . . . A type of cedar . . . was also used by the Indus artisans, but it is not native to the hot plains [of this region]."<sup>820</sup>

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<sup>819</sup>Creighton, *Man Before History*, *loc. cit.*

<sup>820</sup>Jonathan Mark Kenoyer, *Ancient Cities of the Indus Civilization*, (Oxford, Eng., 1998), p. 57.

It is suggested that trees were floated down the various rivers intentionally or because of landslides to supply the huge timbers employed. But this is clearly only an unproved supposition. The timber may also have grown locally. However, the enormous amount of fired bricks used in Harappa and Mohenjo Daro also demand enormous amounts of wood. While the small villages had houses made of sun-dried brick, "most buildings in the cities were constructed either entirely or partially of baked [fired] brick."<sup>821</sup>

It is not reasonable to suggest that great cities of fire-baked brick could have been built from either imported wood or from timber that occasionally flowed from the north in the rivers of India. In order to be able to supply enough fire-baked bricks to build great cities, immense amounts of trees are required, and the trees had to grow locally. It is unimaginable that in a desert, people could find sufficiently great stands of timber to fire-bake millions of bricks. In fact, one of the theories for the collapse of Harappan civilization is that the people there denuded the land of wood to bake bricks. The evidence, I suggest, clearly points to fact that there was plenty of rainfall in and around Harappa to allow for large crops, waste systems, wells, baths, and also for the growth of forests to supply timber for buildings, furniture, and for firing millions of bricks.

Pierre Pfeffer describes the great rivers that flowed through the region.

"The drying-out of this region began between 4,000 and 1,000 B.C., probably after a modification of the local climate, the consequent disappearance of two rivers, the Saraswati and the Ghaggar, and the sinking of the water table. . . .

"The history of the Saraswati is most curious. Hailed in Sanskrit poetry as 'Queen of Rivers,' it flowed until the fourteenth century, [B.C.] into the sea and was lined with flourishing cities; but choked by sands and perhaps swallowed up by other such rivers as the Djamna or the Bias, it could not hold its course across the desert. Today it is an insignificant stream."<sup>822</sup>

Robert Claiborne describes conditions around Harappan civilization:

"Heavier rainfall would, incidentally explain why the Indus people went to the trouble of facing their building with baked brick: unbaked adobe would have slumped back into mud. . . .

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<sup>821</sup>*Ibid.*

<sup>822</sup>Pierre Pfeffer, *Asia*, (New York, 1968), p. 158.

"[P]ollen counts indicate that at the beginning of the Indus period much of it was open woodland—in the lower, moister places, actual jungle. As the civilization grew, cultivation expanded, as shown by an increase in grain pollen in the records. Later, however, pollen from desert plants shows up—and the grain pollen drops off. There seems little doubt then, that the drop-off was due to drought."<sup>823</sup>

Georg Feuerstein, Subhash Kak, and David Frawley, after describing the many rivers, cities, and towns of Harappan civilization, ask:

"What, then, caused the disastrous drying out of the Saraswati/Ghuggar/Hakra River, its tributaries, and the countless artificial canals? What happened to stop the flow of life in the numerous towns once fed and interconnected by this large riverine system? How was all the fertile soil that once framed the river replaced by sand? What changed dramatically the life of one of the earliest civilizations whose central domain stretched all the way from the Yamuna River in the east to the foothills of Afghanistan to the west, and from the Arabian Sea in the south to Kashmir in the extreme north?"<sup>824</sup>

The most nearly precise dating of the change in climate in India and elsewhere discussed is presented by climatologist Reid Bryson of the University of Wisconsin. From the pollen found in varves in salt marshes around Harappa in India he found: "Between 10,000 and 3,600 years ago . . . rainfall was at least three times what it is now."<sup>825</sup> That is, the date for the sudden climatic change in all these desert regions from rainy to arid occurred about 3,500 years ago! As Bryson relates, the climatic conditions around Harappa "changed, and it changed rapidly."<sup>826</sup>

Again, as in the Sahara Desert, we are told the climate did not change gradually, but rapidly. Recently, a book, *Third Millennium B.C. Climate Change and Old World Collapse*, was published in 1997 in Berlin, edited by H. N. Dalfes, G. Kukla, and H. Weiss. The chapter in it on Harappan civilization suggests that aridity overcame Harappa about 2,200 B.C. and not around 1,500 B.C., as is proposed here. What the researchers did was essentially what Bryson and Singh have done. They put down cores into lakes and radiocarbon dated the materials to determine when the aridity began. Their findings

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<sup>823</sup>Robert Claiborne, "How Has Climate Affected History?" *Mysteries of the Past*, J.J. Thorndike, Jr., ed., (New York, 1977), p. 247.

<sup>824</sup>George Feuerstein, *et al.*, *In Search of the Cradle of Civilization*, (Wheaton, IL, 1995), p. 91.

<sup>825</sup>Jonathan Weiner, *Planet Earth*, (Toronto, 1986), p. 99.

<sup>826</sup>*Ibid.*, p. 100.

have been accepted, but that suggests that Harappan civilization continued on in the desiccated Thar Desert for 250 years or more beyond the climate change.

Unfortunately, this idea runs into a major obstacle. How did two great cities, Harappa and Mohenjo Daro, and dozens of large towns and hundreds of villages with their populations continue to live in a desert? We do know that, in Mesopotamia, extensive, large-scale irrigation was necessary to feed its population. But this is not the case for Harappa. In 1999, it was reported that, in this region, "along the Hakra River, where the original settlement pattern has not been seriously disturbed, no evidence of an ancient canal system has yet been found."<sup>827</sup>

To get around this problem, it was then suggested that the people of India channeled the water during the rainy season into old abandoned channels to save the water for irrigation.<sup>828</sup> But the Thar Desert *is* a desert and when there is little or almost no rainfall, one cannot save water which does not exist. Furthermore, even if one could do this, to irrigate the fields demands a very extensive irrigation system. But there is simply no evidence for this, since we are told "India had no tradition of major canal construction."<sup>829</sup>

The only way to feed a society as large as that in ancient India requires extensive agriculture, and one simply does not produce abundant crops in a desert without widespread irrigation. Furthermore, even in the *Third Millennium B.C. Climate Change and Old World Collapse*, a chapter is devoted to the down cutting of one of the rivers there. The researcher has shown that the amount of down cutting is large and continued on into the second millennium B.C. In order for this to occur requires extensive rainfall into that millennium. Therefore, several forms of evidence indicate that the period of aridity occurred much closer to the present than is being presented. I believe the lack of major irrigation canals makes the conclusion presented here quite strong. Of course, ad hoc scenarios can and probably will be offered against this idea. Yet, on the basis of Occam's Razor, the simplest solution that will permit a vast population to thrive in a region that is now desert is that when they lived in this region, there was abundant rain and no need for extensive irrigation.

But is the timing of the drying out of these two regions synchronous, occurring around 1500 B.C.? According to Karl W. Butzer,

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<sup>827</sup>Charles Keith Maisels, *Early Civilization of the Old World*, (London 1999), p. 244.

<sup>828</sup>*Ibid.*

<sup>829</sup>*Ibid.*

"Fragmentary pollen records from tropical Africa suggest one or more warm moist episodes dated at C. 7,500-1,500 B.C., with Mediterranean type vegetation widespread in the highlands of the central and southern Sahara."<sup>830</sup>

Again, pollen evidence directly places the cooler rainy period in the Sahara from around 7,500 to 3,500 years ago, ending about 1,500 B.C. as it does with Harappa.

What, then, happened to the climate across the top of India into Afghanistan. According to Bryson,

". . . the climate in which the Harappans prospered has never reappeared. The [once fresh water] lakes have remained salty. . . . Plants (and animals) that grew where the Harappans lived now grow only on the fringe of the Rajputana Desert. . . .

"The Indus region today is a very dry area, with the Thar Desert at the center. The Thar gets less than five inches of annual rainfall. The surrounding arid region is a quarter of a million square miles or more depending on the definition of 'dry' used. That is 20 percent of India, and about the size of Texas. . . . Away from the Thar itself some agriculture is practiced, but yields are poor certainly not the harvest the Harappans knew."<sup>831</sup>

This change from a cool, wet temperate climate should, therefore, also show up not only in the Indus Valley, but in early civilizations all across the Eurasian mainland. The civilizations should also have collapsed to a great extent because the rich rainfall disappeared and the wet climate was replaced by one that caused deserts to develop.

What the climatologists and historians of this period suggest is that the Sahara dried out about 4,200 to 4,300 years ago, but in India, the same condition occurred several hundred years later. But, even in terms of their own understanding of climate change in these regions, their conclusion is in contradiction to their own knowledge.

It has long been known that rainfall in Egypt and, to some extent, the Sahara, depends on the Indian Ocean monsoons and the position of the Southern Oscillation. As Fagan points out:

"Scientists have long known that droughts in Egypt often coincide with dry conditions in India. In 1908, the *Imperial Gazetteer of India* reported that "it is now fully established that years of drought in western or northwestern India are almost invariably years of low Nile flood. The relation is further confirmed

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<sup>830</sup>Karl W. Butzer, "Climate Change," *Encyclopedia Britannica, Macropedia*, Vol. 4, (Chicago 1982), p. 735.

<sup>831</sup>Reid A. Bryson, Thomas J. Murray, *Climate of Hunger*, (Madison, Wis., 1977), pp. 110-110.

by the fact that years of heavier rain than usual in western India are also years of high Nile flood'. . . ."832

Fagan goes on to show that this connection is generally well established by further research. As pointed out above, Nile floods prior to the great drought, which is here-dated to about 1,500 B.C., were followed by declining levels of the river. Again, Fagan informs us:

"The fragmentary record of Old Kingdom flood levels . . . tells us that Nile floods were exceptionally high just as Egypt became a unified state. . . . There was a rapid decline during the First and Second Dynasties. . . . As the Old Kingdom reached the height of its glory, Nile discharges continued to decline. A dry lake named Birket Qarum, in the Fayum, provides evidence for extremely low flood levels [conventionally dated] after 2,180 B.C. If the Egyptians of the day are to be believed, the subsequent drought cycle was very severe indeed."833

How great was this drought? Fagan speaks of "unprecedented droughts in southern Egypt [which brought starvation and political disorder to the land."834 He cites the high officials, such as Ankhtifi, who recalled them on the sepulchers.

"All of Upper Egypt was dying of hunger, to such a degree that everyone has come to eating his children, but I managed that no one died of hunger in this home [province]. I made a loan of grain to Upper Egypt. . . . The entire country has become like a starved (?) grasshopper, with people going to the north and south [in search of grain]. . . ."835

This was the period described by the sage Ipuwer, who painted a graphic picture of the event.

"'The plunderer is everywhere and the servant takes what he finds.'  
When the Nile did flood, many farmers lacked the confidence to sow crops in a time of chronic uncertainty. Birth rates declined . . . , the dead were thrown into the Nile, and plague swept through the kingdom. The kingdom, Upper [north]

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<sup>832</sup>Brian Fagan, *Floods, Famines, and Emperors*, (New York 1999), pp. 105-16.

<sup>833</sup>*Ibid.*, p. 108.

<sup>834</sup>*Ibid.*, p. 90.

<sup>835</sup>*Ibid.*, p. 99.

Egypt, became 'an empty/dry waste' as sand dunes blew onto the floodplain from the encroaching desert. 'Nay, but men feed on herbs and drink water; neither fruit nor herbage can be found any longer.' People attacked and looted the state granaries: 'The storehouse is empty and its keeper lies stretched on the ground . . . the grain of Egypt is common property.' Tomb robbing [to get money for food] was rampant, and 'the land has been deprived of kingship by a few lawless men.'<sup>836</sup>

What followed after the onset and period of drought is that the silt in the lower Nile River gradually was deposited in the bed of the river year after year raising the water level. When the river bed had been raised sufficiently, the floods began to overflow their banks at a sustained level, and began once again to reflood the river plain so that agriculture could be again carried on. The same did occur in Harappa where the rivers in most instances became dried out.

In essence, by correlating the desertification of the Sahara with Harappa, with Mesopotamia, and the Gobi region, a systematic picture is presented by permanent global climate change.

As for Syria, we learn:

"The question has often been asked whether the climate of Syria has undergone any radical change since antiquity. The presence of large numbers of *tells*, those flat-topped mounds which testify to the ruin of ancient towns many times rebuilt and at last abandoned, and the long lines of mounds which betray the course of ancient canal systems, points to the desiccation of once fertile and well-watered lands, and the great forests of cypress, cedar, and pine which once supplied timber for the shipwrights of Egypt and the architects of Assyria and Babylonia, have almost entirely vanished. That panthers, lions and a species of wild horse roamed the north Mesopotamian steppe is proved by animal remains from the excavations of Tell Barak and elsewhere, and elephants and aurochs were hunted in Syria in the second millennium B.C.; the presence of such large animals implies plentiful water and a far richer vegetation than the sparse undergrowth and almost treeless condition of the area today."<sup>837</sup>

There has been strong denial of this from the archeological establishment. To argue that such a climatic catastrophe had never occurred, Nelson Gueck sums up this viewpoint of most uniformitarian researchers thus:

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<sup>836</sup>*Ibid.*, pp. 100-101.

<sup>837</sup>*The Cambridge Ancient History Early History of the Middle East*, Vol. I, Part 2, I.E.S. Edwards, *et al.*, eds., (Cambridge Eng., 1971), p. 318.

"The easy and unsubstantiated explanation frequently given for the absence or for the downfall and disappearance of whole kingdoms and cultures in the ancient Near East is to assume climatic changes of such severity as to make the establishment or continuation of civilized life impossible. Yet the horrifying tendency of man, wearily repeated throughout the centuries, to take his neighbors' goods or country, or to scorch the land for his own protection and his enemies hurt is all to adequate a reason. It certainly makes understandable why scores of cities have been reduced to faceless rubble, rich countrysides transformed almost overnight into wilderness and in which dark ages have followed times of cultural enlightenment."<sup>838</sup>

What Gueck's scenario fails to deal with is the fact that pollen stratigraphy studies do in fact give clear evidence of a climatic catastrophe in historical times. This catastrophic climate scenario has recently been presented in terms of the established ancient historical chronology. However, a recent archeological dig in Syria at Tell Munbaqa proved that 700 years, at least, must be removed from Mesopotamian history.<sup>839</sup>

How did the people of Mesopotamia describe the climate in its early beginning? Brian Fagan informs us:

"Mesopotamia was once the cradle of civilization, a once-fertile landscape nurturing the earliest cities on Earth.

"Every tree that is pleasant to the sight and good for food . . . ' [S]cribes leave us no doubt their fields were bountiful, soils fertile. Their claims are hard to believe. Today [this region] is desert, its ancient cities set in the midst of wilderness and utter desolation. I remember climbing the Ziggurat Ur on a brutally hot day and gazing out over the utterly arid landscape. 'The Garden of Eden? You've got to be kidding!' exclaimed my companion. Where were the lush water meadows and marshes teeming with fish and fowl, the green irrigated lands, the water-riffled canals, the placid waters of the Euphrates lapping the city walls? Today, not one of . . . [these] great cities is within sight of the Tigris or Euphrates Rivers. Ur lies in the midst of a sandy wasteland. Eridu and Uruk, once the world's greatest cities, look out over torrid wilderness. Yet this was the land where the god Enlil, god of the lands, 'made the people lie down in peaceful pastures like cattle and supplied . . . [them] with water bringing joyful abundance!'"<sup>840</sup>

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<sup>838</sup>Nelson Gueck, *Rivers in the Desert*, (New York, 1959), p. 7.

<sup>839</sup>Gunnar Heinsohn, "Who were the Hyksos?" *Sesto Congresso International Di Egittozia*, Vol. II, (Torino, Italy, 1993).

<sup>840</sup>Brian Fagan, *Time Detectives*, (New York, 1995), pp. 150-151.

According to an ancient inscription from Akkad, there was a sudden long catastrophic climate change.

"The large fields and acres produce no grain.

The flooded fields produce no fish.

The watered gardens produce no honey and wine.

On its plains where grew fine plants, 'lamentation reeds' now grew.

"Curse of Akkad . . ." <sup>841</sup>

Harvey Weiss, Professor of Near Eastern Archeology at Yale University, has outlined the evidence for this change in *The Sciences*. In terms of the thesis presented here, and the revised ancient chronology, the evidence appears to fit quite well. What Weiss shows is that the great Akkadian Empire which stretched all across Mesopotamia "abruptly . . . fell apart." <sup>842</sup> He goes on to describe the range of the area and the catastrophic climate change that occurred.

"[The] seasonal rains became scarce and withering storms replaced them. For more than a hundred years the desertification continued, disrupting societies from southwestern Europe to central Asia. Egypt's Old Kingdom, the towns of Palestine, and the great cities of the Indus Valley also were among the casualties." <sup>843</sup>

There has been a great deal of heated debate by uniformitarian historians who have *invented* various social concepts to permit all these various civilizations to self-destruct at the same time. The very fact that several ancient nations should have all collapsed from political, internal causes is far too coincidental to be believed. According to Weiss, one of the large northern cities covering 200 acres, like all the others, "was suddenly abandoned. . . the collapsed remains of Akkadian buildings are covered with erosion deposits that show no trace of human activity. Only above them, in strata [old established date] do ash, trash, and the monumental remains of a new imperial capital appear." <sup>844</sup> By comparing the ceramic style from one site with those at the same level at others, Weiss was able to show the same desiccation at Tell Leilan to Tell Taya, Chagar Bazar, and Tell al-Hawa. They were all abandoned. He goes on to say,

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<sup>841</sup>Harvey Weiss, "Desert Storm," *The Sciences*, (May-June 1996), p. 31.

<sup>842</sup>*Ibid.*

<sup>843</sup>*Ibid.*

<sup>844</sup>*Ibid.*, p. 33.

"No matter what caused [the people to leave] them [the cities], dust storms and drought made rain-fed farming difficult if not impossible. Year after year crops failed in northern cities. . . .

"Periods of drying climate are nothing new to Near Eastern archaeologists. Evidence of growing aridity [for established chronology] . . . has been accumulating for decades . . . What *is* new are the data showing sudden, severe, long-term climate change—and its puzzling occurrence immediately after a volcanic event. Add to those findings the simultaneous social collapses previously documented, in exhaustive detail, in the Aegean, Egypt, Palestine, Iran, and the Indus Valley, and you have a provocative picture indeed. The problem, oddly enough, is that archaeologists have been ignoring it for decades."<sup>845</sup>

Those academics who attempted to explain these events, according to social scientist John Elster of Columbia University, have resorted to what he terms "story telling." Weiss surprisingly discusses the work of French archeologist Claude F. A. Schaeffer who documented violent catastrophes all over that region of the world and then Weiss dismisses it as "too fantastic for serious study."<sup>846</sup>

According to Professor Gunnar Heinsohn, in an article titled "Destruction Layers in Archaeological Sites," in *Catastrophism 2000*, M. Zysman and C. Whelton, eds., (Toronto, 1990), p. 221, even Schaeffer was puzzled. After showing that there was immense devastation over vast regions of the ancient world, which was beyond the capacity of man's destructive powers, he wondered "How could any [continental] earthquake be so powerful and why should it change the climates? 'At the same time . . . in the Caucasus and in certain areas of prehistoric Europe, changes of climate have caused, it appears, transformations in the occupation and economy of the countries'." (Schaeffer, 1948, 555f)

In *Earth in Upheaval*, Velikovsky presents evidence of "Lake Dwellings" in Europe along the "shores of lakes in Scandinavia, Germany, Switzerland, and northern Italy." These were destroyed twice, according to the investigators, about 3,500 and 2,800 years ago. But most significantly, "It is also generally held that the catastrophes were accompanied by very great and sudden climatic changes."<sup>847</sup>

Stewart Ross describes the change in climate which he attributes to about 1,000 B.C. thus,

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<sup>845</sup>*Ibid.*, pp. 33-34.

<sup>846</sup>*Ibid.*, p. 34.

<sup>847</sup>I. Velikovsky, *Earth in Upheaval*, *op. cit.*, p. 177.

"The British Isles were becoming wetter and cooler. In Scotland the change was exacerbated by massive volcanic activity on Iceland, which raised a dense blanket of dust over the surrounding seas and land masses. The sun was blotted out for long periods, leading to a drop in atmospheric pressure and further heavy rainfall. The immediate repercussions of these dramatic developments on the inhabitants of . . . northern Britain can only be guessed at; we do not know what superstitious [acts] they could have turned to, what sacrifices they made and what prayers they offered to appease the gods, who in their anger, had plunged the landscape into a watery gloom. Longer-term effects of the cataclysm included the abandonment of marginal farmland in the face of advancing peat bog, the desertion of northern settlements and migration away from the inhospitable highlands."<sup>848</sup>

As with other societies, the "cataclysmic" climatic change forced these ancient European peoples to migrate in order to survive.

Speaking of prehistoric Ireland, Michael Herity and George Eogan describe the climate and soil conditions prior to the climate change.

"For the greater part of the [prehistoric] era . . . the environment of Ireland differed significantly in two respects from that of today. . . . For before a deterioration [in climate] which set in about 1,000 B.C., the climate was markedly better, with less cloudy and humid Atlantic weather and probably more blue skies, and with summer temperatures averaging two or more degrees Celsius [3.6F and higher]. A consequence of this was that the blanket bogs of the west of Ireland did not exist . . . a product of a later change to the more humid climate of today, did not then exist and considerable tracts of fertile soil as rich as any in co[unty] Heath grew their own attractive vegetation, both herb and woodland which served to attract farmers. Both these differences are attested in the large numbers of prehistoric monuments found buried under blanket peat in the west of Ireland and even more dramatically in the numbers of prehistoric farmsteads which have emerged from the peat."<sup>849</sup>

Thus, the climate suddenly changed from China to Europe. Thereafter, James Mellart suggested the collapse of civilization in that part of the world was caused by gradual drought. Ultimately Weiss discusses Peter B. deMonocal, a paleo-climatologist, who discovered double the amount of dry dust in the floor of the Gulf of Oman dating to the same time, as evidence for a sudden dry period.

Weiss goes on to conclude:

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<sup>848</sup>Stewart Ross, *Ancient Scotland*, (New York, 1991), pp. 61-62.

<sup>849</sup>Michael Herity, George Eogan, *Ireland in Prehistory* (New York, 1996), p. 250.

"What could have caused such a cataclysmic climatic swing? Geoclimatologists offer a few timid hypotheses—. . . but all remain unproved, and they will remain so until the event itself is fully described. When I asked one prominent investigator to suggest a cause for the climatic change, he looked dumbfounded. 'Don't you understand?' he said, shaking his head. 'If I could answer that, I would get the Nobel Prize.'

"Investigators who support the abrupt—climatic-change hypothesis have sometimes been accused of seeing what they want to see. But that criticism is best turned on its head. For decades, one could say, catastrophes were so unfashionable among archaeologists that we ignored the evidence in front of our noses. We sought other explanations for social collapses because we wanted them to be true."<sup>850</sup>

Although from established dating methods what is offered is not in perfect line with the 3,500 year old thesis, with Heinsohn's 700 year lowering already found in Mesopotamia, Velikovsky is almost exactly correct. That all the world's various deserts began to form about 3,500 years ago at the same time that all those civilizations experienced climatic crises fits together remarkably well. It makes perfectly good sense to correlate the end of the hypsithermal with the drying out of the lands and the collapse of all those societies.

Regarding chronology, the Egyptologists, supremely confident in their dating method, refused to bring down the date of their civilization closer to the present. But their chronology has also been found to be in serious error by Professor Lynn E. Rose who, using precisely dated eclipses, lunations, and moon holidays, has shown that the Twelfth Egyptian Dynasty, dated prior to 1,600 B.C., had to have existed over a thousand years nearer to our own time.<sup>851</sup> In essence, fundamental evidence strongly indicates that the dating of ancient civilizations is much closer to the present and hence the climate catastrophe also occurred much closer to the present than previously assumed.

In fact, there is the striking quotation from Plato regarding the period when forests existed in Attica, Greece, which then disappeared between 2,700 and 2,800 years ago, during the second great pole shift which Velikovsky proposes. Critias, speaking of the ancient past, states:

"What are now her mountains were lofty, soil-clad hills; her so-called shingle-plains of the present day were full of rich soil; and her mountains were heavily afforested—a fact of which there are still visible traces. There are mountains in Attica which can now keep nothing but bees, but which were

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<sup>850</sup>Weiss, "Desert Storm," *op. cit.*, p. 36.

<sup>851</sup>Lynn E. Rose, "The Astronomical Evidence for Dating the End of the Middle Kingdom of Ancient Egypt to the Early Second Millennium: A Reassessment," *Journal of Near Eastern Studies*, Vol. 53, No. 4, pp. 237-261. And more importantly, Lynn E. Rose, "From Calendars to Chronology," *Stephen J. Gould and Immanuel Velikovsky*, D.A. Pearlman ed., (New York, 1996), pp. 663-671.

clothed, not so very long ago, with fine trees producing timber suitable for roofing the largest buildings; and roofs hewn from the timber are still in existence. There were also many lofty cultivated trees, while the country produced boundless pasture for cattle. The annual supply of rainfall was not lost, as it is at present, through being allowed to flow over the denuded surface into the sea, but was received by the country, in all its abundance, into her bosom, where she stored it in her impervious potter's earth and so was able to discharge the drainage of the heights into the hollows in the form of springs and rivers with an abundant volume and a wide territorial distribution. The shrines that survive to the present day on the sites of extinct water supplies are evidence for the correctness of my present hypothesis."<sup>852</sup>

That is, in historical times, the rainfall and forests in Greece had been abundant and then both were greatly reduced all within a generation. Rhys Carpenter, in his *Discontinuity in Greek Civilization*, based on establishment chronology, attempted to explain this climate change by citing the work of Dr. H. W. Willet of the Massachusetts Institute of Technology. Willet's contention was that there had been an expansion and contraction of the circumpolar vortex, with equator-ward or pole-ward displacements. When the vortex had for some unknown reason moved northward toward the pole, it created warm rainy periods north of 50° latitude at roughly Prague, Czechoslovakia. But more importantly, it brought "decreased rainfall equator-ward of this latitude."<sup>853</sup> Therefore, the dry season in Greece which lasts about four months would expand to double this length or eight months.<sup>854</sup> But the specific reason for this fluctuation in the circumpolar vortex is simply posited as a fact which supposedly occurred every 1,850 years since the last Ice Age.

Carpenter posed that when the circumpolar vortex moved northward, the desert belt also moved northward into Greece. Then, when it moved back to its present position, Greece became somewhat less arid. Claiborne, however, citing H. H. Lamb, points out that the circumpolar vortex did indeed move northward around 1,000 A.D., during the Little Climate Optimum, and northern Europe was indeed warmer for a few hundred years. But contrary to Carpenter's thesis, neither Greece, Crete, nor Anatolia experienced great drought.<sup>855</sup>

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<sup>852</sup>A. J. Toynbee, *Greek historical thought from home to the age of Heradius*, (Boston, 1950), pp. 169-170.

<sup>853</sup>Rhys Carpenter, *Discontinuity in Greek Civilization*, (Cambridge, Mass., 1966), p. 62.

<sup>854</sup>*Ibid.*

<sup>855</sup>Robert Claiborne, *Climate, Man, and History*, (New York, 1970), p. 324.

The nature of Carpenter's timing of the drought is also highly problematic, since he set it in the fourteenth and thirteenth centuries B.C. <sup>856</sup> As Claiborne explains, if Greece became arid around 1,200 B.C., then the land to the south and southeast, the Levantine coast of the eastern Mediterranean, "which is hotter and farther south, would have been a howling desert."<sup>857</sup> But if these lands were farther north, as with Greece, they would have been much less arid and then become somewhat more so after 800 B.C., and not have been howling deserts.

This also explains why the more northern desert regions, such as the Sahara, were more verdant until around this time. It was only after around 800 B.C. that the final drying out of the desert belts occurred and destroyed civilization across the Earth.

Based on Velikovsky's theory, the 1,500 B.C. catastrophe tilted the Earth's rotational axis from about 8 to 9 degrees to about 16, 17, or 18 degrees until about 800 B.C. Greece, during that period, would still have remained in the temperate zone. In summer, it would have been positioned farther south, making it much, much warmer. But the Mediterranean Sea would also have been farther south. With warmer air over this warmer sea, evaporation would have been much greater than at present, and the regions around the sea, including Greece, would receive much greater summer rainfall.

In winter, on the other hand, Greece would have been farther and deeper north in the temperate zone. It would then be receiving fully temperate winter rains and snowfalls. The more southern regions of the desert belts would then become most arid around 1,500 B.C. The more northern regions of the desert belts far less so, that is, up until around 800 B.C. This would explain why the great ancient Mesopotamian civilizations could still maintain themselves, but only by large-scale irrigation projects. After the 800 B.C. establishment of the Earth's present axial tilt, their water resources would begin to dry out over a century or more and these civilizations would become only ghosts of their former selves. During this period, the water table would, of necessity, sink deeper below the surface making irrigation agriculture less and less tenable.

Carpenter further points out that in Anatolia, modern Turkey, the Hittites also suffered a drought of the same unparalleled dimension as seen from the Sahara to China.

"Who or what destroyed the Hittite power? Seemingly no human agency, since archaeology has discovered no one to whom the role of destruction can be assigned. Like the Mycenaeans in the Peloponnese at this same period, the Hittites abandoned their towns and villages in the heart of Asia Minor [Turkey]. We know whither they migrated, inasmuch as they survived in a greatly enfeebled state in northern Syria, below the Taurus Mountain rampart to be

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<sup>856</sup>*Ibid.*

<sup>857</sup>*Ibid.*, p. 325.

bearers of the 'sub-Hittite' culture . . . [old date] why did they migrate? Written history offers only one hint—a great famine."<sup>858</sup>

Describing the present conditions in the Hittite region, O. R. Gurney writes,

"The plateau of Asia Minor is in a sense a continuation of the Russian steppe, and its climate is hard. Bitter winds from the north bring heavy falls of snow during the winter months, and after the brief but delightful spring, the country is scorched during the summer by a relentless sun. The rain-clouds spend themselves for the most part on the slope of Taurus or on the hillside bordering the Black Sea. Thus, the central plateau is a parched steppe-land, and it is only in the valleys that enough water and shelter can be found for human habitation. One may travel for hours over the bleak, undulating plain until one is looking down into a well-watered valley many hundreds of feet below. . . . In the Hittite homeland to the north of the Cappadocian River . . . the streams and valley are more numerous and the country somewhat less bleak. Here almost every acre is within reach of a village and is assiduously cultivated. . . . The absence of trees on the higher ground is striking, and there is no shelter there from the biting winds of winter. . . .

"Conditions may have been more temperate in the Hittite period. That the people were as today [sic], mainly devoted to agriculture, is confirmed by the texts . . . Hittite society [was] . . . an agrarian economy . . . We . . . have lists of fields and elaborate title-deeds containing inventories of estates which were obviously of considerable size."<sup>859</sup>

Gurney presents a provocative view that the Hittites attributed their demise to "the weather god" who caused them to "move."<sup>860</sup>

In terms of the thesis being presented here, an axial tilt of the poles from a more perpendicular position to the plane of the orbit to near its present one would allow greater rainfall and a longer growing season in the earlier period and less rainfall and a shorter growing season thereafter. This was what was found in Mesopotamia and China, and is again corroborated by the conditions in historical Greece, which lost its lush forests and pasturage in later historical times.

The reason for this change becomes quite clear, because a pole tilt would restore the very conditions that exist today through this region. The conditions of solar insolation, meteorological wind patterns, rainfall, the creation of monsoon belts, and the destruction of the rich vegetation that grew in the deserts, all fully corroborate each other

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<sup>858</sup>*Ibid.*, p. 46.

<sup>859</sup>O. R. Gurney, *The Hittites*, 2 ed., (London, 1990), p. 65.

<sup>860</sup>*Ibid.*, p. 40.

and the collapse of ancient civilizations at the same time due to a climatic, as well as celestial, poleshift catastrophe. What is most interesting is the nature of the way in which historians have looked at what has always been clear evidence of a climate catastrophe. Similarly, when Darwin looked at the evidence of an extinction catastrophe, he understood that that catastrophe would have shaken the very framework of the globe. Historians, as Darwin, have recoiled at what they have seen and cannot reconcile their observations with their gradualist philosophy. What they were forced to do, as we have discovered repeatedly, was to turn away from the evidence and rationalize it by "storytelling." They felt it was perfectly rational to invent a series of political and civil upheavals in several governments that ruled the major civilizations, all happening around the same time. Just as the gradualists claim that all evidence of catastrophes that befell the megafauna were local catastrophes, over and over, their methods of dealing with catastrophic evidence are the same.

Hermann Flohn claims that it is an established fact that moist climates existed all across the desert belt latitudes during the hipsithermal.<sup>861</sup> Scott Stein, of California, found they occur throughout the Holocene but, overall, states "The vast majority of years during the past 3,500 years . . . have been much drier than what we've come to expect to be normal in California."<sup>862</sup> This aridity in the American southwest can be seen in all the following material of a change from a pluvial to an arid climate 3,500 and 2800 years ago.

The same evidence of a cool, wet period followed by a hot dry one is also found in the Americas. Of the climate in the Great American Desert of the United States southwest, we are told that,

" . . . about eight thousand years ago [around the start of the hipsithermal]. . . a new culture appears. . . .

"The Cochise people may have begun their way of life about ten thousand years ago; certainly they were occupying their territory within two thousand years after that. . . . The Cochise people were not farmers yet, but they did make one significant invention. Archaeologists have found grinding-stones and pestles at the Cochise sites, indicating that they milled the roots and seed they collected . . . [as in the Sahara Desert].

"The earliest Cochise people of southern Arizona lived in a fairly moist environment. We know this because archaeologists have discovered hickory at their sites, and hickory grows only in a land where rainfall is plentiful.<sup>863</sup>

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<sup>861</sup>Hermann Flohn, "Can Climate history repeat itself? Possible climate warming and the case of paleoclimate warm phases," *Man's Impact on Climate*, W. Bach, J. Pahkrath., W. B. Kellogg, eds., (Amsterdam, 1979), pp. 15-28.

<sup>862</sup>William K. Stevens, *The Change in the Weather*, (New York, 1999), p. 40.

<sup>863</sup>Silverberg, *The challenge of Climate*, *op. cit.*, pp. 257-258.

John Upton Terrell describes the early period of the Cochise people thus:

"At the time of the Sulphur Spring Period, a cool and moist climate prevailed in the region. There were rich grasslands and running streams. A section that is now a desert *playa* was then a large lake covering 120 square miles. Along the creeks and bodies of water stood groves of cotton woods and hickory trees. Today there are no living hickory trees closer than seven hundred miles to the area. . . ."864

The second stage of these people dates from after 8,000 years ago to a few centuries before Christ, encompassing the rest of the hypsithermal. Apparently rainfall during this period was plentiful because "Grinding stones and stone tools [for grinding seeds] predominated among the recovered artifacts. However, the milling metates were larger than those of the preceding period."<sup>865</sup> Thereafter, he goes on to say, "The dryness of the climate continued to increase in this [last] period. The desert of the present day was forming."<sup>866</sup>

Apparently, the Rocky Mountains were acting as they do today as a border to halt moisture from the Pacific Ocean from reaching the Great Basin in the amounts it does today. However, the great post glacial lakes would have contributed moisture to the air much as the Great Lakes do today in the American northeast.

One aspect of the evidence related to climate is the growth of the American grain, maize. According to David Wilson, "maize likes plenty of water and has poor resistance to drought. . . ."<sup>867</sup> But then he goes on to show that "in Bat Cave, New Mexico . . . a steady succession of maize types starting at the bottom . . . show[ed] distinct evolutionary progress in several different parts of the plant as he got toward the top layers."<sup>868</sup> The lower layers "were dated to at least 3,600 B.C. . . . [but] The dating put the start of the cultivation of maize two thousand years earlier . . . ."<sup>869</sup> This means 7,600 years ago in New Mexico, there was sufficient rainfall to grow maize. But for how long a period of time did the rainfall last?

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<sup>864</sup>John Upton Terrell, *American Indian Almanac*, *op. cit.*, p. 5.

<sup>865</sup>*Ibid.*, p. 6.

<sup>866</sup>*Ibid.*

<sup>867</sup>David Wilson, *The New Archeology*, *op. cit.*, p. 175.

<sup>868</sup>*Ibid.*

<sup>869</sup>*Ibid.*

"It is in the basin where Mexico City is located that we have the most dramatic evidence of climate as a limiting factor. Here the Bat Cave . . . [evidence] is repeated on a grand scale, with variations. Our evidence of climate change as indicated by the fossil-pollen profile is sustained not only by known lake levels, but also by a thorough study of some 70 meters of sediments. Briefly, the Archaic culture which flourished from about 2,000 to 500 B.C., did so by virtue of an initial period of moist climate and high lake level. About 500 B.C. . . . [was] a time of extreme desiccation and low lake level . . . ."870

Wenke describes the conditions in the American southwest thus:

"Analysis of the animal and plant remains from sites dated between 9,000 and 2,500 years ago reveals an extremely diverse diet. Rabbits, rats and squirrels were trapped . . . and bison, antelopes, and mountain sheep were also occasionally taken. At sites near bodies of water, grebes, pelicans, herons, ducks, swans, geese, and even hawks and ravens appear to have been eaten. . . . The number of grinding stones and digging sticks found in Desert West sites suggests that, as with most hunters and gatherers, much of the diet was supplied by plant foods.<sup>871</sup>

Today the American Southwest could hardly sustain any large type of primitive society which raised corn.

"The Great Basin is the bleakest of American deserts; the landscape is monotonous and almost completely devoid of trees, except along the occasional watercourses where willows and cottonwoods manage to grow. It is an arid upland of plateaus and broad basins, all shut off from the moist Pacific winds by the lofty Sierra, which borders it on the west. The low fault-block ranges that thrust out of the desert are about the only places hospitable to trees, and there grow sparse pinyon pine and juniper. Cacti are practically nonexistent in the Great Basin, except for a few low-growing clumps scattered in places. The green of many other common desert plants likewise is absent. In their place is the abundant sagebrush whose low clumpy form is seen everywhere."<sup>872</sup>

Yet throughout this region in the past, ancient Amerindians were able to grow crops of corn, to harvest nuts and grains which for thousands of years they ground into meal on their grinding stones. Although the climate was not as wet as the Sahara or the

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<sup>870</sup>Sears, "Climate and Civilization," *op. cit.*, p. 46.

<sup>871</sup>Wenke, *Patterns in Prehistory*, *op. cit.*, p. 150.

<sup>872</sup>Peter Farb, *Face of North America*, (New York, 1963), p. 238.

Thar regions, they were not as arid as the present time. Schneider and Londer report, "A series of seven middens [animal fossil wastes] from Rocky Arroyo and Last Chance Canyon in New Mexico suggest that modern desert scrub communities arrived after 4,000 years ago, just past the period of the climate optimum [the hipsithermal]." <sup>873</sup>

This does not mean to suggest that corn was cultivated at this time, but rather, that man gathered corn, among other plants, to grind. He was mainly a hunter gatherer until around 1,500 B.C. Thereafter, he changed his way of life and pursued an agricultural living more intensely after the climate changed and the number and types of animals available for hunting was greatly diminished.

Stephen Plog, in 1997, comments on the climate of the American Southwest:

"Although we once thought that the ancient Southwesterners practiced some corn agriculture as early as 3,000 B.C., reexamination of the evidence has shown convincingly that this was not the case. There is now widespread evidence of cultigens [cultivated crops] from southern Arizona to northwestern New Mexico by 1,000 B.C., with less solid indications during the second millennium B.C. It is, therefore, reasonable to suggest that cultigens were first grown in at least part of the Southwest by about 1,500 B.C." <sup>874</sup>

Speaking of the period from 8,000 to 2,200 B.P., Plog states, "The archaeological evidence, however, is tantalizingly slight. No other epoch in the Southwest involves such uncertainty." <sup>875</sup> He further states, "Interpretations differ as the likely rainfall and temperature patterns brought about by the climatic changes and their impact on vegetation." <sup>876</sup> Although a consensus view exists to suggest "great aridity," this is still in question, basically because plant material decays away easily and hence, "plant foods are probably underrepresented in the surviving evidence from the Paleo-Indian period [the hipsithermal]." <sup>877</sup> He supports this claim on the basis of the great number of grinding stones, <sup>878</sup> which implies much vegetation grew in the Southwest, at that time.

Interestingly, he shows evidence that Clovis hunting projectile points are found at the same stratigraphical level as Paleo-Indian sites, like Venta Cave in Southern

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<sup>873</sup>Schneider, Londer, *The Coevolution of Climate & Life, op. cit.*, p. 107.

<sup>874</sup>Stephen Plot, *Ancient Peoples of the American Southwest*, (New York 1997), p. 52.

<sup>875</sup>*Ibid.*, p. 46.

<sup>876</sup>*Ibid.*, p. 49.

<sup>877</sup>*Ibid.*, p. 50.

<sup>878</sup>*Ibid.*

Arizona.<sup>879</sup> In this respect, James W. Judge claimed that Clovis material is found at these same sites.<sup>880</sup> In essence, we have direct evidence that Clovis people lived during the hipsithermal.

Plog concludes ". . . nor does there appear to have been an inhospitable area for hunters and gatherers exploited only during periods of favorable climate and good availability of resources."<sup>881</sup> All this suggests that the region suffered no great aridity during the hipsithermal.

Can this be dated more accurately to the dates Velikovsky proposed for the catastrophes 3,500 and 2,700 years ago? In this respect, Grayson pointed out earlier that the noble marten became extinct not 11,000 years ago, but around 3,000 years ago.<sup>882</sup> He points out, however, that this animal is not thought to be a desert dwelling organism, but "was also generally thought to have been adapted to cool conditions."<sup>883</sup> Its remains have been found associated with the collared lemming, but in addition, "the noble marten also existed in settings that are better described as temperate. . . ."<sup>884</sup> Although the marten does live in a variety of settings, according to the Britannica, extant marten species live in "northern wooded regions" in North America, "forests in Europe and central Asia, wooded country" in Eurasia, and jungles in southern Asia.<sup>885</sup> Thus, it seems that the Great Basin was sparsely forested during the hipsithermal up to around 3,000 years ago.

However, there is even more precise datings that suggest that there was a major change in climate after 1,500 B.C. Patricia Lambert, a bioarcheologist, studied the bones and teeth of early American Indians of California from 5,000 B.C. up until the arrival of the Europeans.

"She began by searching collar and limb bones for bony plaques (periosteal lesions), which form on the outside of these bones when they are exposed to infection or injury.

"Earlier archeological and medical research had shown severe cases of periosteal lesions. Mobile hunters and foragers rarely suffer from this condition,

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<sup>879</sup>*Ibid.*

<sup>880</sup>James W. Judge, *Paleo-Indian Occupation of the Central Rio Grande Valley in New Mexico*, (Albuquerque, N.M., (1973).

<sup>881</sup>*Ibid.*, p. 51.

<sup>882</sup>Grayson, *The Great Basin*, *op. cit.*, p. 226.

<sup>883</sup>*Ibid.*, p. 184.

<sup>884</sup>*Ibid.*

<sup>885</sup>*Encyclopedia Britannica, Micropedia*, Vol. VI, (Chicago, 1982), pp. 651-65.

which is usually caused by infectious pathogens, because their diet is nutritious, their camps relatively clean and free of parasites. Besides, their small numbers cannot sustain most infectious pathogens.

"Sedentary villagers, like farmers and fisher folk, have a much greater chance of contracting infectious diseases for several reasons. Sanitation is poor around their permanent dwellings, bringing people into contact with animals and soil pathogens. Accelerating trade contacts spread infectious disease over long distances. Furthermore, people living on a few staple foods may suffer from malnutrition, which can make them more susceptible to infection or to nutritional deficiencies. . . .

When Lambert plotted lesion frequencies against time, she found they increased significantly, especially during the . . . period between 1,500 B.C. and 1,100 B.C. . . .

"What caused the increase?"<sup>886</sup>

Lambert discovered that as "health declined, so did the stature of both men and women. Total loss, measured by the length of the femur (the thigh bone), which represents about 27 percent of a person's height, was as much as 4 inches [10 cm]."<sup>887</sup>

Thereafter, Phillip Walker, Lambert's associate, examined the teeth of these early people.

"He found widespread occurrence of dental hypoplasia, bands of defective enamel that form when a child's growth is disrupted by malnutrition, disease, and stress. Hypoplasia is invaluable to biological anthropologists, for it provides a measure of a child's general health and of a group's susceptibility and exposure to disease.

"Like periosteal lesions, hypoplasia increases considerably through time most notably after 1,500 B.C."<sup>888</sup>

What we observe is that prior to 1,500 B.C., these ancient American Indians had been primarily hunter gatherers in an environment rich enough in plants and animal life to allow them to thrive in relatively good health. but after 1,500 B.C., the climate changed the environment significantly enough to force these early people to seek new methods of gaining nutrition, principally through agriculture and settled living which brought about poorer health, notably greater bone lesions, dental hypoplasia and reduction in height. This condition, I suggest, can be most clearly understood as a major

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<sup>886</sup>Brian Fagan, *Time Detectives*, *op. cit.*, pp. 86-87.

<sup>887</sup>*Ibid.*, pp. 87-88.

<sup>888</sup>*Ibid.*, p. 88.

climatic change occurring around 1,500 B.C. which changed the habitat in which these hunter-gatherers depended and drove them to adopt new methods to sustain their lives.

How, then, did the people who survived the change in climate live in the Great Basin? According to Peter Farb:

"Speaking about the 'Digger Indians' of the Great Basin, the explorer, Jedediah Smith, opined in 1827 that they were 'the most miserable objects in creation.' Actually, many different Shoshonean-speaking groups shared this disdainful name given them by whites who saw them half-starved, grubbing for roots. Mark Twain, riding the overland stage west of the Great Salt Lake in 1861, reported [in *Roughing it*, (New York, 1871), pp. 131-132 of] coming across 'the wretchedest type of mankind I have ever seen up to this writing'. He went on to describe the Gosiute, one of those groups commonly called Diggers, who 'produce nothing at all, and have no villages and no gatherings together into strictly defined tribal communities—a people whose only shelter is a rag cast on a bush to keep off a portion of the snow, and yet who inhabit one of the most rocky, wintry, repulsive wastes that our country or any other can exhibit'. . . .

"From the moment that the first explorers encountered them, there was no doubt that the Shoshonean-speaking Indians who inhabited one of the driest and least hospitable areas of the continent, led a miserable existence. They pried roots out of the ground with a digging stick. They made simple nets to snare rabbits. The whites watched with disgust as the diggers devoured grasshoppers."<sup>889</sup>

Farb goes on to point out:

"The cultural impoverishment of the Diggers (who hereafter will be called the Shoshone; they include Ute, Paiute, Northern Shoshone, and Gosiute bands) is explained. . . . The . . . Shoshone inhabited one of the bleakest places on Earth, a stern environment. . . . The Great Basin is a land of dry soil, high evaporation, low rainfall. Native plants that can resist drought such as greasewood and sagebrush, are of little value to humans. Native plants bearing edible seeds or roots do occur in abundance around streams, but streams are few and far between. . . .

"Because of the simplicity of their culture and the limitation imposed by the environment, the Great Basin Shoshone, over much of their range, lived at the density of one person to fifty square miles, and in some places only one every hundred miles. No more than a few families could remain together for any length of time. There simply was not enough food to go around."<sup>890</sup>

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<sup>889</sup>Peter Farb, *Man's Rise to Civilization*, (New York, 1968), pp. 16-17.

<sup>890</sup>*Ibid.*, pp. 20 and 21.

The conditions of these people was so bad that when the Paiutes "obtained horses from the Spaniards . . . instead of using the horses for hunting, the Paiute ate them."<sup>891</sup> There was very little to hunt and the horses were a boon to a hungry people. Thus, it became understandable that, after the climate change, the peoples of the American Southwest to California, were forced to change their lifestyle to gain sustenance and their stature and dental condition deteriorated. This is similar to the Chinese who went from settled living into a nomad lifestyle, at the same time, or the fall in population density of Harappan society in the Thar Desert, at the same time.

Clearly, related to this is the level of certain lakes in the Great Basin, Grayson points to the climate "puzzle" from Mono and Walker lakes. He found that "some 3,500 years ago, the surface of Mono Lake was at an elevation of about . . . 121' [feet] above its current level. . . ." <sup>892</sup> Walker Lake is believed by some researchers to have had a higher water level 3,500 years ago when the Walker River suddenly reversed its flow. The problem is that in both instances, more rainfall than at present is required to accomplish these higher stands of water. Grayson was driven to suggest

"The problem the [reverse Walker River flow] raises is clear. If the major high and low stands of these two lakes during the past 4,000 years have corresponded in time, and if Mono Lake levels have been driven by climatic change . . . whereas those of Walker Lake have been driven by the fickle nature of Walker River . . . , then what caused the similarities in lake histories here?

"Clearly, if similarities are real, some commonality probably underlies them. Since climate provides the obvious mechanism to account for the similarities in lake levels, perhaps the weakness lies in the reliance of shifts in the direction of flow of Walker River."<sup>893</sup>

What seems apparent is that the high water levels of these lakes in the Great Basin is related to climate conditions which generated greater rainfall than assumed.

In this respect, Velikovsky's discussion of "Lakes of the Great Basin and the End of the Ice Age" in *Earth in Upheaval*, pages 170-172, is pertinent in that he showed that the mineral content of several lakes in the Great Basin suggest they were much higher about 3,500 years ago. Based on the evaporation rates and influent of water since that time, and the present levels of these lakes, several authorities drew the conclusion they were larger and deeper 3,500 years ago.

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<sup>891</sup> *Ibid.*, p. 10.

<sup>892</sup> Grayson, *The Great Basin, op. cit.*, p. 223.

<sup>893</sup> *Ibid.*, p. 224.

Furthermore, Valmore LaMarch did a study of the timberline on the White Mountains in eastern California and the Snake Range in eastern Nevada.<sup>894</sup> The ability of trees to migrate out of valleys higher up the slopes of adjacent mountains requires both warmer summers accompanied by greater rainfall. As one ascends a mountain, adiabatic air pressure falls (fewer atoms exist to collide and generate heat with altitude) which causes the temperature to fall; that is why mountains are cooler than valleys. Rainfall tends to run off mountains rapidly into the lower valleys and thus the water table on mountains tends to be found deeper beneath the ground surface than in adjacent valleys. Therefore, if trees migrate up mountains for a long period of time, that is an indication that the climate was milder and rainier. What LaMarch found on one mountain was that the timberline from about 6,500 to 4,200 years ago stood 500 feet higher than it does presently after which it suddenly dropped. On another mountain, he found the timberline was clearly higher, 260 to 360 feet above that of today. But significantly this high timberline continued to about 2,500 years ago before falling. Averaging both records, LaMarch concluded that between 7,400 to 4,000 years ago the climate in California and Nevada was warmer and wetter.

With respect to this evidence, Lamb dates the change in climate to around 1,500 B.C.

"The retreat of the forest from the heights is registered in the case of the White Mountains of California. . . . The Author of these [temperature-rainfall] curves suggests that the Campito Mountain upper treeline is lower both by low temperature and low rainfall, whereas the sheep mountain treeline is controlled by the temperatures of the summer half of the year. These differences are thought to account for the differences observed in the curves from these two mountains in the same group. There is, however, much in common between the histories on the two mountains. Both register the prevailing warmth prior to about 1,500 B.C. There is even a suggestion from the Campito Mountain record that summer temperatures and rainfall in the area may have increased somewhat from 4,000 to 2,000 B.C. The lowering of the upper treeline in that area since has occurred in . . . sharp downward steps, around 1,500 B.C., [and] 500 B.C."<sup>895</sup>

Thus in the Americas, there was fairly abundant rainfall from about 8,000 to 2,500 years ago. All in all, J. D. MacDougal sums up the general condition of the Earth during the hypsithermal! "In fact, there is no evidence for any deserts at this time."<sup>896</sup> From the Gobi Desert in China, to India, to Mesopotamia, to Israel, to the Sinai Desert, and the Arabian Desert, to Egypt and the Sahara Desert, to the Great American Desert,

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<sup>894</sup>V. C. LaMarch, Jr., "Holocene Climate Variations inferred from treeline fluctuations in the White Mountains, California," *Quaternary Research*, Vol. 3, (1973), pp. 632-660.

<sup>895</sup>Lamb, *Climatic History and the Future*, *op. cit.*, pp. 394-396.

<sup>896</sup>J. D. MacDougal, *A Short History of Planet Earth*, (New York, 1996), p. 229.

and to Mexico, the same climatic story is repeated. About 8,500 years ago, the climate became cooler and rainier. About 3,500 years ago there was a sudden worldwide desiccation which created the great deserts and about 2,800 years ago a further tilting of the poles caused the climate to become even more arid in these same regions. That is when Greece's climate became much more arid. The vegetation and climate in all these regions repeats the same scenario.

Why would people settle in a desert region or even go there to live. For example, William K. Stevens, writing in *The New York Times* for October 3, 1989, pages C1 and C14, discusses this issue.

"Archaeologists working in Peru have unearthed stunning evidence that monumental architecture, complex societies and planned developments first appeared and flowered in the New World between 5,000 and 3,500 years ago." He goes on to say, "Around 4,000 to 3,700 years ago, activity abruptly shifted and irrigated agriculture replaced fishing as the main economic resource." He then comments, "It is something of a mystery to archaeologists why any major civilization would develop in the Andean valleys and on the Peruvian coast. The region's altitude and aridity make it 'grossly hostile,' said Dr. [Michael] Mosely [an archaeologist at the University of Florida who has long worked in the region] who adds: 'That anyone ever lived there is a bit of surprise.'"

People do not move from more comfortable regions to ones that are "grossly hostile." They move from "grossly hostile" regions to ones that are distinctly more conducive to life.

Stevens concludes: "The emerging picture of this earliest American civilization is that of a people tied initially to the sea, but then, moving abruptly—no one knows why—into the Andes highlands to build a flourishing economy based on irrigated agriculture that prospered in spite of the harsh cold and climate at altitudes around 10,000 feet."

But, as we know, during the hypsithermal, the various treelines on the mountains had risen too much, much higher elevation on all the mountains of the Earth. The original people lived at lower elevation prior to the mountains' catastrophic rise in a clement environment at that altitude prior to 3,500 years ago, but then when the mountain rose and the climate changed they employed irrigation to survive. But even this effort failed, as Velikovsky pointed out.

"The foothills of the Andes hide numerous deserted towns and abandoned terraces, monuments . . . that go up the slope of the Andes and reach the eternal snow line and continue under the snow to some unidentified altitude. . . . In Peru [according to E. Huntington] 'aerial surveys in the dry belt

west of the Andes have shown an unexpected number of old ruins and an almost incredible number of terraces of cultivation."<sup>897</sup>

Eventually, the conditions became so hostile that the people abandoned these regions which would not support them. The very same problem exists in all the desert regions of the Earth. Jacquetta Hawkes, a distinguished researcher into the ancient past, raises the same question.

"As for the climate of Mesopotamia, most of its features are abominable to man. It is simply divided between a fiercely hot summer and a winter that is cold and even frosty. It is true that in the mid-valley, in the land that was to be Assyria, height, the proximity of the mountains and a winter rainfall produce fair spring with cultivable fields, natural pasture and carpets of wild flowers. but after May even these uplands are burnt brown. In the south the sun strikes the vast monotonous plain with seemingly vindictive ferocity, winds, pick up the dry soil and choke men and all their works with dust, while rain is so scanty and irregular that farming has always been impossible without irrigation.

"The difficulty and frequent insecurity of the environment seems to have affected the 'form' of Mesopotamian civilization to its psychological roots. The ceaseless, often frustrated, efforts to maintain the irrigation system in which each town, and later city, depended, could help to inspire the vision of man as a slave of higher powers. The uncertainty and occasional violence of the necessary flood, and shifts in river beds, could ruin a city in a few days, and have helped to arouse the sense of insecurity."<sup>898</sup>

Both in the Americas and the great Afro-Asian land mass, we are asked to accept that people went into a grossly hostile environment to live and build high levels of civilization capable of supporting large populations. What I suggest makes far better sense is that these ancient peoples settled in these regions while they were well watered by rainfall during the hipsithermal and built advanced cultures. Then, after the climate changed, the people who survived and stayed behind while others migrated were forced to adopt massive irrigation projects to support themselves. In regions where the devastation and climate change were simply too great, the civilization ended and was replaced by either new settlers, who lived as nomads on the land, with sparse flocks of goats or other kine or the older settlers did the same. People do not migrate into regions that are grossly hostile to survival.

All in all, the environment of the great deserts of Asia have not been conducive to the early growth of civilizations. Even at the turn of the century, with all the advantages of over 2,000 years of man's experience with this environment, the level of agriculture

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<sup>897</sup>Velikovskiy, *Earth in Upheaval*, *op. cit.*, p. 86.

<sup>898</sup>Jacquetta Hawkes, *The First Great Civilizations*, (New York, 1973), p. 23.

has not enabled humanity to rebuild even the semblance of these early civilizations. As Gertrude Bell writing in 1909 describes the conditions that a European found in Turkey and stretching away to the Gobi Desert,

"Before him stretch wide plains, corn growing where rainfall and springs permit, often enough barren save for dry scrub of aromatic herbs, or flecked with shining miles of saline deposit; naked ranges of mountains stand sentinel over this featureless expanse; the sparse villages unsheltered from wind or sun lie along the skirts of the hills, catching thirstily at the snow-fed streams that are barely enough for the patch of cultivated ground below; the weary road deep in dust or mud according to the season, drags its intolerable length to the horizon. It is Asia with all its vastness, with all its brutal disregard for life and comfort . . . or of existence; it is the Ancient East after so many millennium of human endeavor to its natural desolation."<sup>899</sup>

It is into this great desolation we are asked to believe that early man came to develop agriculture. Why hasn't man, during the last few millennia, rebuilt these vast networks of irrigation in the Thar, where Harappa existed, or in Mesopotamia? The answer seems clear that conditions after the hipsithermal ended allowed humans to live in these regions only with immense effort, and these conditions, in the end, overcame human ingenuity.

Furthermore, these very early peoples raised sheep and goats, cattle and pigs. These animals are herbivores which crop the vegetation low to the ground and would have destroyed whatever grew in these sparse desert environments that presently exist. The peoples who raise these animals in the various desert regions are nomadic in order to find enough forage for their flocks. They do not also carry on extensive farming. Again, people do not migrate into desert regions with their flocks and families. Quite to the contrary, they migrate out of such regions.

In an earlier discussion of the various climate zones, it was pointed out that these zones move north when the Earth warms, and south when the Earth cools. As David Raup explains:

"Climatic change also produces species-area effects. As global temperature falls, climatic zones in middle [temperate zone] and low [torrid zone] latitudes become narrower. Isotherms (lines of equal temperature) are pushed southward in the Northern Hemisphere and northward in the Southern Hemisphere. If global temperature increases isotherms move away from the equator, making tropical zones wider. This bellows-like expansion and

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<sup>899</sup>W. R. Ramsey, G. Bell, *The Thousand-and-One Churches*, (London, 1909), p. 297.

contraction of climatic zones increases and decreases habitable areas for many plants and animals."<sup>900</sup>

This we fully discussed regarding the movement of plant zones in the previous chapter. The problem with the hipsithermal is that the isotherms in the temperate zones did not only move northward in the northern hemisphere and southward in the southern hemisphere, as the Earth's temperature increased. The isotherms in the temperate zones also moved southward in the northern hemisphere and northward in the southern hemisphere. While the northern part of the temperate zone in the northern hemisphere warmed and expanded toward the pole, the southern part of that temperate zone cooled and expanded southward toward the equator. And this also occurred in the southern hemisphere but in reverse. To wit, the near polar regions became warmer and the near equatorial regions became cooler. This behavior defies every uniformitarian analysis that claims the obliquity of the Earth's axis never changed.

Furthermore, one is faced by yet another phenomenon, meteorological in nature, associated with the flowering of the great deserts. The question that arises is: How could these deserts, by and large, through the hipsithermal, have had anything like sufficient rainfall to sustain such a rich vegetation when fundamental meteorological, geological factors requires just the opposite with the present tilt of the Earth? The meteorological-geological causes for the formation of the great desert belts is very well understood and explained by Hadley Cell circulation which is delineated thus:

"Hot air currents rise at the equator and then flow north and south into cooler latitudes, where they descend. Warm air can carry more moisture than cold air, so the rising equatorial air currents are initially very humid. But as they rise they cool; their moisture condenses as clouds, and finally falls as rain. The high altitude air, having shed its moisture [as tropical rain] flows away toward the Tropics [Cancer and Capricorn] 1,500 kilometers [930 miles] north and south of the equator, and eventually begins to descend. By now it has lost all the water it once carried, so it brings no rain to the land beneath. Furthermore, as it nears the earth's surface and is rewarmed, it sucks up any available moisture from the land over which it flows on its way back toward the equator. This circulation of air thus creates belts of parched lands [deserts] around the Tropic of Cancer in the north and the Tropic of Capricorn in the south."<sup>901</sup>

On its return trip to the equatorial region, very little moisture is added to these air masses, and they must travel about 15 degrees before they pick up sufficient moisture to again generate heavy rainfall over the lush tropical rain forests of the torrid zone. With the present tilt of the Earth's axis, the hipsithermal period should have allowed this

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<sup>900</sup>David M. Raup, *Extinction, op. cit.*, p. 146.

<sup>901</sup>David Attenborough, *The Living Planet, op. cit.*, pp. 141-144.

process to occur and form deserts instead of creating rainfall for trees to grow. When the Ice Age ended and the glaciers receded and reached their more distant, northern boundary 8,000 years ago, the climatic conditions that are presently operating should have then come into play, and the desert belts should have become extremely arid; but this desiccation process did not occur. Instead of drying up from the dry air masses sinking over them, the desert belts instead became cool, moist regions covered by grassland and trees. Silverberg and Lamb have expressed puzzlement regarding this basic contradiction to the meteorological conditions that should have followed.

"This seems paradoxical. If, during the Pleistocene the Sahara had had pluvial [rainy] periods while Europe was having glacials, why should a warm epoch [the hipsithermal] in Europe coincide with a wet one in the Sahara? If Europe now had the full benefit of the rain-laden westerlies, why was the Sahara not smitten by the 'horse-latitude' dryness as it is today? As the British climatologist, H. H. Lamb [in *The Changing Climate, 1966*] has observed, 'There seems to be something meteorologically curious about this conjunction of pluvial times and conditions for life in the Sahara with the warmest post-glacial epoch in the temperate zone. Explanation in simple terms of a poleward shift of all climatic zones would hardly be adequate. . . .'"<sup>902</sup>

On the basis of fundamental meteorological facts, Lamb understood perfectly that the deserts should have become desiccated 8,000 or so years ago.

The reason for this is quite basic. Given the present obliquity of the Earth's polar axis, one would find that during the hipsithermal, the greatest climatic warmth influenced the arctic basin but would have very little effect on the torrid and temperate zones. This is well understood by all meteorological workers.

Clyde Orr, Jr. states:

"During the last century temperatures have risen in the Northern Hemisphere as a whole somewhere between 1 and 2 degrees Fahrenheit. . . . The general change has been in the form of milder winters, with the colder areas receiving the most increase and warm areas being less affected."<sup>903</sup>

According to Borisov, "The rise in temperature [from 1896 to 1938] was particularly noticeable in the high latitudes especially in winter."<sup>904</sup> While there was a

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<sup>902</sup>Silverberg, *The Challenge of Climate, op. cit.*, p. 156.

<sup>903</sup>Clyde Orr, Jr., *Between Earth and Sky*, (New York, 1961), p. 161.

<sup>904</sup>Borisov, *Can Man Change the Climate, op. cit.*, p. 45.

pronounced warming of the arctic basin during the winter, these effects diminish as one moves toward the equator. There was very little temperature change in the southern part of the temperate zone, and none to speak of in the tropics. This phenomenon is a stark contradiction of these ancient weather patterns and is a clear demonstration of the concept of a less oblique orientation of the geographical axis.

If, indeed, the climatic zones moved northward in the northern hemisphere, and southward in the southern hemisphere, then the desert regions should also have moved in these directions. But, as a matter of fact, the desert regions did not migrate, as is required by the zonal belt concept that uniformitarian analysis requires. Instead, the great desert belts simply became cooler and not warmer, wetter and not drier. Because the deserts were cooler then, rain would be expected. If one suggests the monsoon belt moved farther from the equator, then so, too, should the desert belt. That this did not happen again points to a different orientation of the polar axis.

Several uniformitarian theories have been advanced to blame human behavior for the creation of the deserts. For example,

"Joseph Otterman . . . from Tel Aviv University, has suggested that grazing has actually encouraged the growth of major deserts. In North Africa, some 6,000 years ago during the Antithermal period climates wetter than today's encouraged plant growth. . . . Otterman speculates that domestic animals may have been introduced in sufficient numbers to have trampled and overgrazed much of the Middle East, which might have been a significant factor in the ensuing desertification. He argues that overgrazing might even have contributed significantly to the desertification of the formerly verdant fertile crescent over the past several thousand years. . . .

"Other researchers believe that people must bear even more responsibility for climatic change. Carl Sagan and two of his former students, Owen Toon and James Pollack . . . examined the possible climatic impact of humans since the domestication of fire, plants, and animals. They concluded that 'the progression from hunter to farmer to technologist has increased the variety and pace more than the geographic extent of human impact on the environment. A number of regions of the earth have experienced significant climatic changes closely related in time to anthropogenic environmental changes.'"<sup>905</sup>

What Otterman and Sagan, *et al.*, do not address are the facts outlined above that elucidate the meteorological factors that should have created deserts about 8,000 years ago. What they simply overlook in their analyses is that the desert climate during the hipsithermal was an anomaly. They take it as a given that if man did not live in these desert regions, they would have remained verdant. But the amount of rainfall in these regions would not have been affected by human behavior to such a great extent. During the hipsithermal great rivers flowed in the Sahara, great lakes extended across the region

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<sup>905</sup>Schneider, Londer, *The Co-evolution of Climate & Life, op. cit.*, p. 295.

and sufficient rain fell to allow temperate trees to grow. Once man moved out of these deserts, why didn't the rain still fall from whatever sources from which it originally had? The cause is not to be sought in the effects created by human behavior. It is to be sought in the vast geophysical changes caused by a poleshift over the entire globe.

However, H. H. Lamb fully debunks the overgrazing thesis thus:

"There have been suggestions in recent years from various archaeologists, engineers and others, including meteorological theoreticians using mathematical modeling of the atmosphere, that the Sahara Desert was created by Man destroying the vegetation through overgrazing by his animals. Such ideas ignore the development of the desert in Late Glacial times [when Man did not have herd animals] . . . Old dunes formed of loose sand, now fixed by vegetation, indicate an extension of full desert conditions 500 km [310 miles] south of the Sahara—and a northward displacement of the Kalahari Desert into the Congo—in the latter part of the last interglacial as well as in late glacial times."<sup>906</sup>

In essence, the southern Sahara and northern Kalahari regions had become deserts at times before Man had domesticated animals and, thus, only climatic changes could be responsible for these effects.

In region after region, all across the globe, we encounter the same climatic events. Rainfall is plentiful and great rivers and lakes form, while forests thrive and the soil is rich and brings forth abundance. Man thrives in these conditions from China, to Harappa, to Arabia, to Mesopotamia, to Egypt and in the Americas, as well. Civilizations begin to be erected and life is effulgent, the earth providing Man's needs without end. But then in region after region, all across the globe, all this climatic abundance ceases and humanity is decimated and aridity without end consumes the soil. The people who survive migrate out of these regions driven by desperation to find new lands where they could survive, while those who remain behind are forced to adopt nomadism or some form of pastoralism and the hot winds blow away the fertile soil creating deserts in a few decades. Is one to believe that this occurred in a whole series of separate steps at times that differ over 700 years? The evidence suggests otherwise, and points to a single global climatic catastrophe that affected the human race in this wide belt simultaneously. And the evidence seems to be coincidental with a 1,500 B.C. date everywhere.

Paul Dunbavin elaborates on the climatological effects of a more perpendicular inclination of the polar axis and how this would affect the global climate.

"The most important single variable in the climate is temperature. This is influenced by two main factors, the angle of incidence at which the Sun's rays strike the surface, and by how long the Sun remains above the horizon each day.

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<sup>906</sup>Lamb, *Climatic History and the Future*, *op. cit.*, p. 388.

The heat of the Sun's rays is reduced by the thickness of the atmosphere through which they must pass and by the increased area of ground over which their effects are spread."<sup>907</sup>

What, then, would happen to the air currents on an Earth that had a significantly smaller inclination of the polar axis than that of the present? Dunbavin further explains:

"The temperature gradient between the tropical and polar regions would be greatly reduced and consequently less heat would need to be transferred [from the tropics] across the temperate zone. The whole weather system would be effectively 'turned down' and the weather patterns would become much more stable and predictable. Not only would seasonal temperature extremes be reduced but severe storms would become less common; and the equinox winds less pronounced."<sup>908</sup>

This is corroborated by Lamb who claims,

"From . . . 6,500 B.C. [8,500 years ago] onwards, it seems that the [atmosphere] circulation gradually became on the whole weaker, more zonally oriented and with its action centres farther north."<sup>909</sup>

All that this indicates is that the strong Hadley cell atmospheric circulation from the tropics to the polar regions was greatly reduced and the air circulation moved not as greatly north south, but primarily west and east. This is precisely what a highly perpendicular poleshift would accomplish. The range of temperature difference between the polar regions and the tropics would be greatly reduced because both these zones and the regions in between them would be receiving more equitable amounts of sunlight in terms of direct radiation and duration per day. There would be less energy required to move air masses north and south to offset the thermal imbalance between the poles and equator.

Dunbavin is speaking of about a 20 degree axial tilt compared to the 23.5 degree tilt of the present time. But what of an even smaller axial tilt, of say 8 or 10 degrees? To all intents, there would be only minor changes in the seasons of the year and the difference in the temperature gradient from the equator to the poles would be even more greatly reduced. Under such a regime, hot moist air at the tropics would be able to travel

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<sup>907</sup>Dunbavin, *The Atlantis Researchers, op. cit.*, p. 82.

<sup>908</sup>*Ibid.*, p. 85.

<sup>909</sup>H. H. Lamb, *Climatic History and the Future, op. cit.*, p. 384.

much farther north and south<sup>910</sup> similar to the condition of present-day monsoons, but they would not act as strongly. There would be an ongoing, year-around, weak monsoon condition stretching all across the desert regions of the Earth bringing year-round rainfall to them with zonal winds bringing rain from the Atlantic ocean.

And in fact, Frenzel, speaking of the Sahara during the hipsithermal, states that "the rainfall simultaneously in the north and south of the Sahara, was higher than at present."<sup>911</sup> Of course, it goes without saying that greater, more uniform rainfall year round in the Sahara is in direct contradiction to what would occur with the present obliquity of the poles. This climatic and meteorological behavior accords perfectly with a very small axial tilt.

The explanation for all the phenomena outlined is in complete accord with the timing of the poleshifts described by Velikovsky. When the obliquity of the Earth's axis is more perpendicular to the ecliptic, the temperate zones must expand north and south. The seasonal variations of temperature between the tropical and polar regions must be reduced and, therefore, the new, greatly enlarged temperate zone must experience almost exactly the same temperature seasonality and rainfall conditions experienced in the temperate regions today. The desert regions of today would no longer be situated predominantly in the torrid zone, but mostly in the temperate zone. Therefore, the deserts would have had typically temperate rainy seasons in spring and summer and little or no dry seasons in winter and fall. There are, of course, complicating geographical factors that affected the climate such as mountain ranges which would have to be incorporated into the picture, but the overall general conditions that are found presently in the temperate zone with regard to temperature and rainfall would have been found to exist in the desert belts during the hipsithermal. If one moves the deserts into the temperate zone, they will experience temperate weather.

Lamb explains that the rainfall was related to a different regional distribution but does not explain why this occurred.

"Reconstruction of the prevailing atmospheric circulation during each of the main stages of post-glacial climate history produces a record of probable latitude of the North Atlantic-North European storm zone. . . . They indicate a more northern position of the subtropical anticyclonic belt between about nine thousand and three thousand years ago than either before or since, culminating with prevailing positions around latitude 40N through the middle of that period, is consistent with summer monsoon rains penetrating much further north than now over the Sahara region. With such a pattern, it is no wonder that there was enough vegetation and surface water in the Sahara for animals and men . . . and

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<sup>910</sup>*Ibid.*, p. 387.

<sup>911</sup>B. Frenzel, *Fluctuations of the Ice Age*, *op. cit.*, p. 197.

that Lake Chad was much bigger than now between about 7,000 B.C. or earlier and 3,000 B.C."<sup>912</sup>

Sutcliffe claims: "Lake Chad was formerly nearly 1,000 KM [620 miles] long, requiring a water intake 16 times greater than at present, in an area that is now mostly desert. . . ." <sup>913</sup>

Fekri A. Hassan, with respect to the Sahara states:

"The retreat of the trees, after the development of the forest maximum around 4,000 BP was, as Bonnefille, Riollet and Buchet . . . put it, "une recession brutale des arbres [a brutal recession of the trees]." A numerical analysis of the high resolution Holocene pollen record from Burundi affirms that 'a sharp decrease of arboreal [tree] pollen percentages and a noticeable increase of *Celtis*, a semi-deciduous tree; which indicates the opening of montane forest due to a drier climate, occurred at 3,800 BP . . . . The decrease in arboreal pollen was associated with an increase in non-arboreal pollen. . . . This dry episode is also recorded in Rwanda . . . and in the highlands of Uganda . . . , at Lake Victoria . . . and in Ethiopia. Farther to the west, Lake Bosomtwe in Ghana fell at 3,750 BP in response to arid conditions . . . Other low lake levels are noted by Gasse, and Van Camp. . . . Maximum aridity is also evident in Lake Sumxi, Western Tibet where maximum aridity for the whole Holocene period is recorded at ca 3,800 years BP, by a minimum in *Artemisia/Chenopodia-ceae* pollen and in carbonate content as well as a minimum in . . . [oxygen] contents in the lake water."<sup>914</sup>

He goes on to say that the data "amplify and resonate with the data from the Faiyum and Delta [regions of Egypt], suggesting that the 3,800-3,600 bp time interval aridity accompanied by cooler conditions prevailed over equatorial and eastern Africa."<sup>915</sup>

This monsoon expansion northward was worldwide, but there is really no explanation for it other than a poleshift.

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<sup>912</sup>H. H. Lamb, *Climate History and the World*, (London, 1982), pp. 119-120.

<sup>913</sup>A. J. Sutcliffe, *On the Track of Ice Age Mammals*, (Cambridge, Mass., 1985), p. 22.

<sup>914</sup>Fekri A. Hassan, "Nile Floods and Political Disorder in Early Egypt," *Third Millennium B.C. Climate Change and Old World Collapse*, H. N. Dalfes, G. Kukla, H. Weiss, eds., (Berlin 1997), p. 9.

<sup>915</sup>*Ibid.*, ff.

Another phenomenon that also shows quite directly that the desert regions of the Earth were cooler during the hysithermal than today has to do with the process of evaporation. Extremely hot regions, such as the desert belts, are subject to extreme rates of evaporation. Presently the southern part of the desert belt in the northern hemisphere experiences seasonal monsoons. However, because of the extremely high temperatures in these regions, unless there is continual, strong rainfall throughout the monsoon season, the high temperature there would evaporate the water that did fall and, in a very short time, the desert would lose its moisture. That is, only during the monsoon season, when there is daily, heavy rainfall can the deserts bloom. A moderate monsoon season alone will not allow cypress, wild olive, oak, sycamore, etc., to thrive in the desert belts. There must be year-round rainfall to satisfy this situation with a much cooler climate to greatly limit evaporation. As pointed out in the *Britannica*, "The Sahara exhibits climatic extremes. It has the highest evaporation rates in the world—more than 304 inches [25 feet] (7,720 millimeters) [7.7 meters] per year at Bouroukou in Chad . . . ." <sup>916</sup>

Herman Flohn points out that the "highest mean summer temperature of 37-38° [over 100F] occur in the extensive desert belt of the Sahara, over Arabia and southern Iraq to the Indus." <sup>917</sup> Under these temperatures, evaporation rates would have been quite significant.

Nevertheless, the high temperature rates that must exist with the present tilt of the Earth's axis would evaporate any precipitation quite rapidly. What is required to permit trees to grow in the desert belts with the present tilt of the Earth's axis is more than just continual, moderate, year-round rainfall. However, if the tilt of the Earth's axis was much more perpendicular to the plane of its orbit, then the equivalent latitude of the desert belts would fall into the subtropical region with a lower annual temperature and, therefore, less evaporation of whatever water fell as rain. A lower annual temperature would lessen rainfall evaporation and would allow the deserts to bloom.

Howarth well understood that the climate of the northern hemisphere was much more temperate all across North America and Eurasia. This he also based on the distribution of temperate plants and animals. <sup>918</sup>

However, based on the historical interpretation, a chronology for ancient Egypt was created which suggests Egypt and all these other ancient civilizations existed in times of little or very little precipitation. What has been disclosed above is that there was a period in early historical times which was pluvial, and that it ended abruptly and catastrophically around 1,500 B.C., but was exacerbated and became even more arid some 700 years later, about 700 to 800 B.C. The last 150 years of historical research has been used by researchers to present just the opposite view, namely that there was no climatic catastrophe ever of the size and global dimensions just outlined.

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<sup>916</sup>*Encyclopedia Britannica, Macropedia*, Vol. 16, (Chicago 1982), p. 149.

<sup>917</sup>Herman Flohn, *Climate and Weather*, (transl. B.V. deG. Walden, (New York, 1969), p. 160.

<sup>918</sup>Howarth, *the Mammoth and the Flood*, "Chapter X," *op. cit.*, pp. 257-294.

Interestingly, Velikovsky spoke of many years of darkness which followed after the 1,500 B.C. cataclysm.<sup>919</sup> Many individuals have been unable to explain such a long period of darkness which followed that catastrophe. Of course, a comet can black out the sun's light for some months and will be described below, but rainfall will then remove this dust in months. Thus, we would seemingly be left with a dilemma as to what created years of darkness. I am not suggesting complete darkness all the time, but prolonged periods when the sky was covered by dust which would often occlude the sun. In this respect, the end of the hypsithermal and the desertification of the vast belt of land around the globe would create just such conditions to generate immense clouds of dust.

The best example which explains what had to ensue with the drying out of the desert belt 3,500 years ago is what happened in the American Midwest in the 1930s when it formed a dust bowl. As reported by Donald Worster, in his book, *Dust Bowl*,

"Dust in the air is one phenomenon. However, dust storms are quite another. The story of the southern plains in the 1930s is essentially about dust storms, when the earth ran amok. And not once or twice, but over and over for the better part of a decade: day after day, year after year. . . .

"Weather bureau stations on the plains reported a few small dust storms throughout 1932, as many as 179 in April 1933, and in November of that year, a large one that carried all the way to Georgia and New York. But it was the May 1934 blow that swept in a new dark age. On 9 May, brown earth from Montana and Wyoming swirled up from the ground, was captured by extremely high-level winds, and was blown eastward toward the Dakotas. More dirt was sucked into the airstream, until 350 million tons were riding toward urban America. By late afternoon, the storm had reached Dubuque and Madison, and by evening, 12 million tons of dust were falling like snow over Chicago . . . advancing gloom stretched south from there over several states, moving as fast as 100 miles an hour. the dawn of 11 May found the dust settling over Boston, New York, Washington, and Atlanta, and then the storm moved out to sea. Savannah's skies were hazy all day 12 May; it was the last city to report dust conditions. But there were still ships out in the Atlantic, some of them 300 miles off the coast, that found dust on their decks during the next day or two. . . .

"Two types of dusters became common then: the dramatic 'black blizzards' and the more frequent 'sand blows.' The first came with a rolling turbulence, rising like a long wall of muddy water as high as 7,000 to 8,000 feet . . . sometimes accompanied by thunder and lightning . . . The second kind of duster was a more constant event created by low sirocco-like winds . . . and left sandier soils drifted into dunes. . . .

"In 1935, after a February heat wave, . . . the dust began moving across Kansas, Oklahoma, and Texas, and for the next six weeks it was unusual to see a clear sky from dawn until sundown. On 15 March, Denver reported that a serious dust storm was speeding eastward. Kansans ignored the radio warnings,

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<sup>919</sup>Velikovsky, *Worlds in Collision*, *op. cit.*, pp. 126-134.

went about their business as usual, and later wondered what had hit them. Small-town printer Nate White was at a picture show [movie] when the dust reached Smith Center: as he walked out the exit it was as if someone had put a blindfold over his eyes. . . .

"By the end of the month, conditions had become so unrelenting that many Kansans had begun to chew their nails. 'Watch for the Second Coming of Christ,' warned one of Topeka's unhinged, 'God is wrathful.' Street-corner sects in Hill City and other towns warned pedestrians to heed the signs of the times. A slightly less Concordian jotted in her log: 'This is ultimate darkness. So must come the end of the world.' The mood of the people had begun to change, if not to apocalyptic dread in every case, at least to a fear that this was a nightmare that might never end."<sup>920</sup>

For anyone who has read accounts from individuals such as Lawrence Svobida's *Farming the Dust Bowl*, who experienced these events firsthand, it is clear that the shock and surprise of the first storms grew to dread and forebodings of doom as the sky darkened again and again. No one who had lived through these harrowing events was untouched.

Now, this was a very short period of drought which desiccated an area larger than France, Germany, and England combined. Think, then, of what had to have happened with the end of the hipsithermal, with the desiccation of a belt of land across about fifteen degrees of latitude and encompassing an area larger than the African continent. Think of a desiccation so complete that never ended and blew away trillions of tons of dust, blackening the skies across vast regions of the Earth not for days and weeks, but perhaps for months at a time. Of course, the sky would clear up after these dust storms subsided, but no one knew when they would rage forth again bringing gloom and darkness over many regions. The people unable to understand the nature of these blizzards of darkness would record these events in their myths as years of darkness.

The end of the hipsithermal requires that the soil, which had covered a resplendent Earth, would (in the desert belts) become desiccated and be blown away to create gloom and darkness, day after day, year after year for decades until the deserts were formed and little soil lay bare to be carried aloft.

What, then, of the archeological evidence and other written records of the past related to this ancient historical catastrophe? For the Near East we have Claude A. Schaeffer's research which Weiss is well acquainted with, but refuses to examine objectively because of his uniformitarian approach to this evidence. Yet, if a catastrophe befell the entire globe, as Velikovsky posits, then prior to and accompanying the climate change one would naturally expect great cataclysms to have destroyed these early civilizations. Although many of the readers of this work are aware of Schaeffer's evidence, it is, nevertheless, necessary to restate it briefly for those not familiar with this monumental research. What Schaeffer did was examine and survey the archeological

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<sup>920</sup>Donald Worster, *The Dust Bowl: The Southern Plains in the 1930s*, (Oxford, Eng., 1979), pp. 13-17.

findings from the vast region encompassing the Near East. Velikovsky summarized his material thus:

"Claude Schaeffer, the excavator of Ras Shamra (Ugarit) in Syria, came to Troy . . . and became convinced that the earthquakes and conflagrations he had noted at Ras Shamra were synchronical with the earthquakes and conflagrations of Troy Six hundred miles away. He then compared the findings of those two places with signs of earthquakes in numerous localities of the ancient East. After painstaking work, he came to the conclusion that more than once in historical times the entire region had been shaken by prodigious earthquakes, an area unusually large, when compared with the largest areas affected by earthquakes in modern times. He wrote:

"There is not for us the slightest doubt that the conflagration of Troy II corresponds to the catastrophe that made an end to the habitations of the Old Bronze Age of Alaca Huyuk, of Alisar, of Tarsus, of Tepe Hissar [in Asia Minor], and to the catastrophe that burned ancient Ugarit (II) in Syria, the city of Byblos that flourished under the Old Kingdom of Egypt, the contemporaneous cities of Palestine and that was among the causes which terminated the Old Kingdom of Egypt."<sup>921</sup>

"After a time of decay most of these cities were restored in a new era of rich civilization."<sup>922</sup>

Velikovsky goes on to show that the region over which Schaeffer proved these catastrophes occurred was immense:

"All of these catastrophes of earthquake and fire were of such encompassing extent that Asia Minor, Mesopotamia, the Caucasus, the Iranian Plateau, Syria, Palestine, Cyprus, and Egypt were simultaneously overwhelmed and some of these catastrophes were, in addition, of such violence that they closed great ages in the history of ancient civilization.

"The enumerated countries were the subject of Schaeffer's detailed inquiry; and recognizing the magnitude of the catastrophes that had no parallels in modern annals or in the concepts of seismology, he became convinced that

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<sup>921</sup>Claude F. A. Schaeffer, *Stratigraphie comparée et chronologie de l'Asie Occidentale, IIIe et IIe Millénaires*, (Oxford, Eng., 1948), p. 225.

<sup>922</sup>Velikovsky, *Earth in Upheaval*, *op. cit.*, p. 193.

these countries, the ancient sites of which he studied, represented only a fraction of the area that was gripped by shocks."<sup>923</sup>

One final point before moving on. Researchers have now concluded that Claude Schaeffer's analysis of the collapse of ancient civilizations is correct, but not necessarily that it occurred at the same time over such wide areas. Alan Thompson reports,

"The rise and fall of many ancient societies may have been due to earthquakes, according to a Stanford University researcher.

"Amos Nur says that new and revised evidence shows that earthquakes could have caused Jericho's walls to tumble down and [create] many other cataclysms and social upheavals in the ancient world. . . .

"Ancient societies would be ill-prepared by modern standards to withstand intense earthquakes and associated tidal waves. . . .

"Dr. Nur says that because elites controlled ancient societies they were particularly vulnerable to natural disasters. . . .

"The destruction of one elite [group] would lead to the collapse of economic and social structures, creating a vacuum. This vacuum could provide the impetus for invaders or poorer, perhaps indigenous people to fill the gap. . . ." <sup>924</sup>

All this, Nur believes, makes for a sound explanation of the collapse of these ancient civilizations, but he conceives that all this destruction was stretched out over hundreds of years and did not occur all at one time. What his theory fails to address is that the climate changed abruptly. A global retilting of the Earth's axis would no doubt create immense earthquakes, floods, and permanent climate changes.

In fact, as reported by Prof. Benny Peiser, there is a new book, *Archaeoseismology*, S. Stiror, R. E. Jones eds., (British School at Athens, 1996), Fitch Laboratory Occasional Papers. Peiser reports:

"'Archaeologists of my generation who attended university in the immediate aftermath of [Claude] Schaeffer's great work (1948), were brought up to view earthquakes, like religion as an archaeological phenomenon to be avoided if at all possible.' With this statement about the traditional restrictions and limitations of archaeological research, Prof. Elizabeth French, one of the world's leading scholars in Bronze Age archaeology, opens her paper on

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<sup>923</sup>*Ibid.*, pp. 194-195.

<sup>924</sup>Alan Thompson, "How Jericho Tumbled," *The Times Higher Education Supplement*, (May 2, 1997), p. 7.

"Evidence for an Earthquake at Mycenae" which is part of . . . [the] new book, *Archaeoseismology*. Half a century after Claude Schaeffer published his groundbreaking *Stratigraphie Comparée et Chronologie L'Asie Occidentale*, a number of archaeologists have started to speak their minds.

"In fact, during the last 20 years, a gradual development towards neo-catastrophism has occurred in the field of archaeology. A growing number of scholars have documented evidence for natural disasters during the Mediterranean Bronze Age civilizations. From this accumulative data, some have concluded that the end of the Aegean Bronze Age might have been triggered by widespread seismic activity."

Peiser, also discusses another new book, *Third Millennium B.C. Climate Change and Old World Social Collapse*, (Springer Verlag, 1997) which contains the work of

". . . 40 scholars [who now] suggest that abrupt climate change at around 2,200 B.C. might have triggered the collapse of Early Bronze Age Civilization in Europe."<sup>925</sup>

The concept that Schaeffer and Velikovsky began, appears to be gathering strength as new generations of researchers begin to unravel the evidence. They still do not consider Velikovsky correct, but this is, at least, a beginning.

What then of Indian and Harappan civilization? According to Stanley Wolpert, the end of Harappa was catastrophic.

"It appears that the . . . powerful empire of Harappa sustained some cataclysmic blows. . . . Thanks to the recent, careful work and creative archeological studies undertaken by George Dales,<sup>926</sup> and Robert Raikes,<sup>927</sup> it is now generally recognized that, around 1,700 B.C., a series of floods caused by tectonic earth [quake] movements brought an end to this once glorious civilization. For whatever reason, the Indus seems to have changed its course, spelling ruination to the balanced system of Harappan agriculture. Hoards of jewelry and other precious objects, including copper tools, have been found in the highest strata of Mohenjo-Daro, indicating the sense of impending doom and the wide-spread fear that must have gripped the populace as the flood waters rose. Many homes were hastily abandoned. Cooking pots were found strewn

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<sup>925</sup>Clark Whelton, *Kronia Catastrophist Talk Group*, (May 8, 1997).

<sup>926</sup>George Dales, "New Investigation of Mohenjo-Daro," *Archaeology*, Vol. 18, No. 2, (1965), pp. 145-150.

<sup>927</sup>Robert Raikes, "The End of the Ancient Cities of the Indus," *American Anthropologist*, Vol. 66, No. 2, (1964), pp. 284-299.

across kitchens; straw was found that had smoldered after a roof collapsed, as were fragments of burned wooden door jambs. But most revealing of all are the skeletons of people fleeing, a family of five caught in the debris as their walls and ceiling crumbled, as the earth moved, or as the river raced in. At least thirty skeletons have been found at Mohenjo-Daro alone, not buried but trapped, killed by some terrible disaster. They were assumed, until recently, to have been massacred by an invading army, though now it seems more likely that all were fleeing a combined earthquake and flood. . . .

"The glory of Harappa had more than faded. The city empire with its wondrous citadels was gone, disappearing as dramatically, almost as inexplicably, as it had emerged, washed over by the silt of the Indus . . . like a world of sand castles reclaimed by rising tide, its crumbling walls and vague outlines [are] all that remain . . ." <sup>928</sup>

Whatever cities and part of their populations survived were then faced with a climate that made agriculture impossible and the people either starved or migrated out of the region. As with the Near East, destruction was overwhelming and migration out of the drying areas commenced, or new peoples migrated into the area and established societies that contained very different artifacts, as found in the ground by archeologists.

As for China, the records were discussed by Kevin D. Pang, who attributes the catastrophe that occurred to the eruption of Thera, a volcano in the Mediterranean Sea. He claims that around 1600, (although admitting "Unfortunately the . . . Chinese sources . . . are without accurate dates.") in the time of King Chieh, who lived at the same time as the Shang dynasty, according to the "twelfth century historian Lo Pi in *Lu Shih* that at the time of Chieh . . . during the last years . . . ice formed in [summer] mornings and frost in the sixth month. Heavy rainfall toppled temples and buildings. Therefore famine broke out. The [Bamboo Annals] . . . further record that there were floods followed by seven years of drought . . . Mot Zu says 'As for King Chieh, heaven gave severe orders. The sun and moon were untimely. Hot and cold weather arrived in disorder. . . . The five cereal crops withered and died.'" <sup>929</sup> Seasons in "disorder" are quite indicative of a poleshift which Pang seems to have overlooked. Charles Pellegrino who spoke with Pang about this catastrophe was told that after the event "in the northern provinces whole populations starved and [from an agricultural society the people] returned to tribal nomadism." <sup>930</sup> This, of course, implies a climatic change in northern China that forced change on the society's way of life.

In the Americas, however, the evidence of cataclysms is less equivocal than in China. M. D. Coe claims that in America a "mighty cataclysm" destroyed the first Olmec civilization, termed the San Lorenzo culture, around 900 B.C. The destruction was so

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<sup>928</sup>Stanley Wolpert, *A New History of India*, 2ed., (Oxford, Eng., 1982), pp. 21-23.

<sup>929</sup>Kevin D. Pang, "The Legacies of Eruption," *The Sciences*, Vol. 31, No. 1, (Jan/Feb 1991), p. 34.

<sup>930</sup>Charles Pellegrino, *Return to Sodom and Gomorrah*, (New York, 1994), p. 208.

great that he claims it exhibited "an actual period of marked cultural change" which took place at most Mesoamerican sites.<sup>931</sup> The cause of this broad area of cultural collapse and sudden change in culture and artifacts from one type to a starkly different type, as that outlined for the Near East is still unknown. However, G. W. Lowe significantly states whatever brought about the change was clearly catastrophic. "The end of the San Lorenzo Phase occupation at San Lorenzo was preceded by a thorough destruction."<sup>932</sup> At some Olmec sites, including San Lorenzo, "there is evidence of violence at the end."<sup>933</sup> Like the earliest San Lorenzo, Coe claims that La Venta in Mesoamerica was destroyed. "Its fall was certainly violent."<sup>934</sup>

Henri Stierlin, who did much of the early excavations and research on the Olmec, writes of their collapse and disappearance:

"But after reaching the high point of their achievement . . . —the Olmec people seem to have collapsed and disappeared. The circumstances of that disappearance, if they were known, would no doubt transform our understanding of American Prehistory. But the Olmecs have left no records save for their strange sculpture, calendrical inscriptions and the ruins of their buildings. Their end is as mysterious as were their origins. . . ." <sup>935</sup>

Of course, it is extraordinarily difficult for historians, archeologists, and others raised in the uniformitarian tradition to accept the catastrophic interpretation that these societies fell because of a few global catastrophes, and permanent climatic changes as posited by Velikovsky. But it does appear that the end of each of these civilizations came violently and was followed by permanent new climatic conditions. Climatic changes of such breadth over the entire globe cannot be attributed to human action, nor to volcanic eruptions, nor to small cometary impacts. What is required is a force powerful enough to not only "shake the framework of the world" but permanently change its polar orientation to bring about these stupendous, global, climatic changes.

The catastrophic extinction theory also explains two other anthropological enigmas; namely the sudden disappearance of the Clovis people in the Americas and the cave painters, whose drawings of mammoths and other Ice Age animals were found in

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<sup>931</sup>M. D. Coe, *Mexico*, 4 ed. (London, 1988), p. 71.

<sup>932</sup>G. W. Lowe, "Eastern Mesoamerica," *Chronologies in New World Archeology*, R. E. Taylor, C. M. Meighan eds., (New York, 1978), p. 358.

<sup>933</sup>J. A. Tainter, *The Collapse of Complex Societies*, (Cambridge, Eng., 1990), p. 12.

<sup>934</sup>Coe, *Mexico*, *op. cit.*, p. 75.

<sup>935</sup>Henri Stierlin, "The Olmecs, a race of precursors," *The World's Last Mysteries*, (Pleasantville, N. Y., 1978), p. 259.

southern France and also in Spain. Hadingham describes the art that followed the extinction in Europe:

"At some undefined point . . . [old date] it was all over: realistic animal carvings [and paintings] were no longer produced by the hunters of France and Spain. In their place we have a few scattered examples of a totally abstract art form, which makes a depressing comparison of the achievements of the Magdalenian's."<sup>936</sup>

Fagan describes the abrupt vanishing of the Clovis culture:

"The Clovis people flourished on the Great Plains . . . and then [old date] . . . , they abruptly vanished, to be replaced by a multitude of different hunting-and-gathering cultures . . . . What happened is one of the mysteries of modern archaeology. By an intriguing coincidence—if coincidence it be—the disappearance of Clovis coincides with one of the great mysteries of vertebrate paleontology too—the mass extinction of Ice Age big-game animals, the megafauna."<sup>937</sup>

In both civilized regions and primitive regions, the catastrophic event that destroyed the megaherbivores all destroyed whole cultures and what followed were entirely new and different societal complexes that built anew on the buried or destroyed societies that had met their end. Those that did survive were either driven to migrate to new homes or adapt their old ways of living to the new environments and climates that came into existence. Had the Clovis and early Europeans lived through the extinction, we would have found their ancestors culturally evolving into new life patterns gradually. Overwhelmed by destruction they disappeared, while here and there others did survive to take their places and develop new cultural ways and leave different artifacts.

With respect to the extinction, one can then understand, on a fundamental level, why the megafauna were primarily overwhelmed by the catastrophe which retitled the Earth's axis to near its present inclination. If the temperate zones had expanded broadly enough, temperate animals dependent on these climatic conditions, as well as temperate plants, would also increase their ranges both to the north and to the south. Therefore, if a catastrophe occurred under such conditions, the temperate vegetation, insects, fresh water fish, mollusks, etc., would have inhabited a far greater expanse of the Earth's broader temperate zones. Those few that survived that catastrophe in the ranges of the new temperate zone of the more recent time, would have a better chance of not going extinct. They would still be situated in the same temperate climate zone, although a narrower one.

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<sup>936</sup>Hadingham, *Secrets of the Stone Age*, *op.cit.*, pp. 265-266.

<sup>937</sup>Fagan, *The Great Journey*, *op.cit.*, p. 189.

Plant seeds would especially survive, since conditions for their survival and growth would not have changed. Small organisms with smaller nutritional requirements than megaherbivores would also have a better chance for survival after the catastrophe finding in the limited vegetation enough nourishment to carry them through to the regrowth of new forage. However, most of the few surviving megafauna with much greater nutritional demands and lower birth rates would not as readily have been able to find sufficient forage to endure and survive those first few months after the cataclysm in the temporarily impoverished environment. They would have a far greater chance of dying off. Only a very few of the large mammals that were alive and intact would be lucky enough to find forage to carry them through the recovery period and to find mates with which to propagate if they found themselves in the climatic zone suitable for their survival.

Kurten discusses the unresolved evidence of the global distribution of the lion during the Wisconsin Ice Age.

"Already at this stage, the lion had conquered a range which is remarkable for a wild animal . . . ."

"At the height of its triumph then, the lion was present in five continents: Africa, Europe, Asia, North and South America. For a wild animal, this story is unparalleled in the history of the earth. No other species of land mammal ever conquered such an area before the coming of man . . . well may the lion be styled the King of Beasts.

"To perform this feat, lions had to adapt to almost every climatic regime imaginable, from the dry cold of the Arctic, to the humid heat of the tropics; to make a living in rainforests, in sun-scorched steppes, in temperate forests, in the mountains, on the northern tundra. The versatility of the species boggles the mind. Explanations are not easy to find."<sup>938</sup>

But if the poles were highly perpendicular, then the lion would have inhabited only two climatic zones—the tropics and the temperate zone. In both zones it could well survive, but certainly not on tundra, which will not even support the ancient mammals. This broad distribution tends to support the view that the poles were less oblique during the hypsithermal. This is similar to today, where the moose and wolf can live in the temperate and arctic regions.

The catastrophic nature in terms of size is well attested to in the literature. J. E. Guilday states:

"Large mammals are inherently more vulnerable to environmental changes simply because they are large and require a greater expanse of primary

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<sup>938</sup>Kurten, *Before the Indians*, *op.cit.*, pp. 60-61.

habitat to sustain themselves because of greater individual demands for food or space to play out their reproductive and defense strategies, cope, flight, herding, etc. Greater demands are placed upon the habitat by an elephant than by a small rodent."<sup>939</sup>

Lister enlarges on the concept of reproduction:

". . . large mammals have a much slower rate of reproduction and so find it more difficult to recover from any decimation of their numbers. A single pair of mice can, in a few years, give rise to several generations comprising thousands of individuals. Mammoths, on the other hand, were unlikely to reproduce before the age of about 15, had a gestation period of nearly two years, produced only a single calf per litter, and a female would be unlikely to give birth again for three or four years."<sup>940</sup>

A. D. Barnosky adds to this point:

"In addition, large animals are generally characterized by small populations and small numbers of species within a genus, whereas most small mammals are characterized by large populations and several species per genre. It is statistically easier to destroy a few individuals that compose an elephant population than it is to destroy the many that constitute a mouse population. Similarly, it is easier to wipe out a genus made up of few a species than one that includes many species."<sup>941</sup>

David M. Raup specifically points out:

"The Ice Age extinction was selective in that it affected mammals far more than other organisms and in that extinction rates were far higher among large mammals than small. The cutoff for distinguishing large and small mammals is conventionally set at 100 pounds (44 kg) adult body weight. Selection for size can be seen among genera as well as species. [He then shows that among small animals, 10% of species became extinct and 5% of genera, while for large animals, 72% of species and 65% of genera disappeared.]

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<sup>939</sup>J. E. Guilday, Pleistocene extinction and environmental change case study of the Appalachians," *Quaternary Extinctions*, P. S. Martin, R. G. Klein, eds. (Tucson, Ariz., 1984), p. 256.

<sup>940</sup>Lister, *Mammoths*, *op. cit.*, p. 125.

<sup>941</sup>Anthony D. Barnosky, "The Late Pleistocene event as a Paradigm for widespread Mammal Extinction," *Mass Extinction Process and Evidence*, Stephen K. Donovan, ed., (New York, 1989), pp. 240-243.

"The higher percentages for large animals are indeed striking and sample sizes are large enough to make statistical testing possible. Testing shows that the preponderance of extinction among large mammals is not likely to be due merely to chance (bad luck). It appears that large size really did put land mammals at a much higher risk of extinction."<sup>942</sup>

This is not proof of size being the essential factor in the extinction under discussion, but when taken together with all the rest of the evidence, it is compelling.

If, indeed, the geographic pole was tilted only about eight degrees instead of its present 23.5 degrees, the Arctic and Antarctic circles would retreat to about one-third of their present latitude. While the present tilt allows the frigid zone to encompass an area of about 8,350,000 square miles, an eight degree tilt would encompass an area of only 965,000 square miles, or over eighty-eight percent less area. The Arctic and Antarctic circles would only be about 554 miles from the pole while the present ones are about 1,630 miles. Under this condition, eight times less of the Arctic Ocean region and Antarctica would be in the frigid zone. All of Siberia, Canada, Alaska, and Europe would be well south of the new Arctic Circle. Only northern most Greenland, the Franz Joseph Land Islands, and two islands of Severnaya Zemlya would lie inside the frigid zone.

Under such an axial tilt, what would ensue is that, although the new, narrower torrid zone would experience the same hot climate, the broadened temperate zones would tend to have warmer winters and cooler summers, but no great extreme swings in seasonal temperature. The new polar regions would, however, be ameliorated to the greatest extent. This would occur for two fundamental reasons. Because these near polar areas were outside of the Arctic and Antarctic circles, they would then be well inside the new temperate zones. Therefore, they would receive sunlit days as well as night periods every day of the year. In addition, this arctic temperate region would also be receiving much more direct sunlight because this radiation would pass through less atmosphere to reach the surface, thus carrying greater amounts of solar energy. The great extremes of perpetual, seasonal, polar night and day would only exist in a very small area and, therefore, its ability to affect the climate of the surrounding regions must be greatly reduced because air masses passing over this much smaller cold region would lose far less heat than if they passed over far larger cold regions. But then these same air masses must pass over the open Arctic Ocean water or Antarctic land, which would then reheat these parcels of air. This would significantly warm all these adjacent polar regions.

However, a second process comes into play that greatly reinforces this ameliorative effect. Once there are perennial day-night diurnal fluctuations in these regions, be they ocean, as in the northern hemisphere (Arctic Ocean), or land mass in the southern hemisphere (Antarctic continent), the ice caps must melt away to practically nothing because of this diurnal warmth. This would change the albedo of the surface (its ability to reflect sunlight), which will become much smaller. Dark ocean water and land

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<sup>942</sup>David M. Raup, *Extinction*, (New York, 1991), p. 91.

absorb much more sunlight than snow or ice and with the Arctic Ocean overwhelmingly free of ice all year long it would be absorbing solar energy daily and radiating it back to the atmosphere. The landmasses surrounding the ocean will be even more greatly warmed especially in winter. As we are all aware from our previous discussion, warm oceans greatly affect the climates of the adjacent landmasses.

Hence, the landmasses of North America, Europe, and Asia adjacent to the Arctic Ocean had undoubtedly been much warmer throughout the year. This, of course, would be evidenced by trees and other vegetation which has been discussed above but must be further examined.

While the change from plenty to an impoverished climate occurred in the deserts around 1500 B.C., the same impoverishment also occurred in the far north which, Velikovsky outlines in his chapter "*Klimasturz*," or climatic plunge.

" . . . in 1910, at the International Geological Congress in Stockholm, facts were placed before the scientists that demonstrated great changes and catastrophic fluctuation in the climate of the earth in the past few thousand years. Since that congress, many works have been written to describe the climatic . . . changes that occurred in this recent time . . . "

" . . . one very strong disturbance in the climate, or climate plunge (*Klimasturz*), occurred in the subboreal, a subdivision of the Recent, as is assigned to the middle of the second millennium before the present era [1,500 B.C.] The second climatic catastrophe of the Recent period took place in the century following the year -800, a time period that is well within recorded history. 'The beginning of the period of unchanging climate has advanced later and later before the attacks of geologists, and now in the minds of most authors who concern themselves, with the subject, it apparently stands only a few centuries before Christ. . . . '

"[According to the work of Axel Blytt, Gunnar Anderson, and Rutger Sernander] In Scandinavia the last *Klimasturz* marked the end of the Bronze Age. The following centuries offer a picture of desolation and wretchedness attributed to the altered climate. 'Opulent plenty' was followed by 'striking poverty.' Study of changes in flora, as reflected in the pollen of trees found in the ancient moors, also disclosed a picture of a sudden climatic catastrophe. 'The deterioration of the climate must have been catastrophic in character,' wrote Sernander."<sup>943</sup>

Again as in the deserts where opulent plenty was followed by striking poverty, the northern rim of the arctic region suffered a similar fate. While the deserts became much warmer, the northern regions became much cooler. This, of course, would be what would happen if the axial tilt of the poles moved from higher perpendicularity to one similar to that of today with greater obliquity. The more southerly regions would become warmer and the more northerly regions would become cooler.

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<sup>943</sup>Velikovsky, *Earth In Upheaval*, *op. cit.*, pp. 172-174.

Furthermore, Velikovsky showed that A. P. Okladnikov discovered a Bronze Age metal shop buried in the lower Lena basin where 2,000 B.C. bronze was cast.<sup>944</sup> This suggests that in 2,000 B.C., the Arctic basin was warm enough to support civilized society, which then vanished.

While I have just concentrated attention on the migration of temperate trees into the deserts in terms of meteorological, geological and biological factors, the very same phenomena are also related to the migration of trees into the high arctic. That is, there are meteorological, geological and biological factors that must reflect a more perpendicular orientation of the obliquity of the poles for *large trees* to grow in these high latitudes. To begin, Sanderson, in a 1969 article in *Pursuit*, states:

"In the New Siberian Islands . . . whole trees [associated with mammoth remains] have turned up; the trees of the family that include the plum; and with their leaves and fruits. NO SUCH HARDWOOD TREES GROW TODAY ANYWHERE WITHIN TWO THOUSAND MILES [SOUTH] OF THESE ISLANDS. Therefore, the climate must have been very much different when they got buried. . . . They must have grown thereabouts, and the climate must have been not only warm enough, but have had a long enough growing period of summer sunlight for them to have leafed and fruited."<sup>945</sup> (Capitalization added)

Not only on the New Siberian Islands has this type of hardwood tree been found; but Charlesworth also claims that during the hypsithermal, a wild, temperate type bush, with "ripe fruit [and] stones" or pits were found on "Spitsbergen."<sup>946</sup>

The bush is called *Empetrum Nigrum* or black crowberry. However, this bush does not now grow and produce flowers and ripe fruits with stones or pits on Spitsbergen. According to J. V. B. Bell and J. H. Tallis, this plant only grows in the temperate zone. From Scandinavia (slightly above the Arctic Circle) it grows down to Scotland, Ireland, and England, to the Pyrenees Mountains between France and Spain, the Auvergne of France, the Apennines of Italy, the Alps of Italy, France, Switzerland, Australia, and Germany. It also grows throughout the lowlands of Holland, Denmark, Germany, and Poland.<sup>947</sup>

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<sup>944</sup>Velikovsky, *Earth in Upheaval*, *op.cit.*, pp. 279-280.

<sup>945</sup>Ivan T. Sanderson, "Much About Muck," *Pursuit*, (Oct., 1969), pp. 68-69.

<sup>946</sup>Charlesworth, *The Quaternary Era*, Vol. II, *op. cit.*, p. 1487; see also, pp. 1484-1487.

<sup>947</sup>J. V. B. Bell, J. H. Tallis, "Biological Flora of the British Isles, *Journal of Ecology*, Vol. 61, No. 1, (1973), p. 290-291.

In order to blossom, it requires temperate zone photoperiodic signals.<sup>948</sup> To grow fruit with ripe seeds it needs a long growing season. For example, in England, flowering occurs from late March to May, and growth continues until September or October.<sup>949</sup> Although this bush grows in bogs, heaths, and grasslands throughout Europe and Asia, the predominant plants in the region (not the exact same place) that also grow are temperate forests of deciduous trees, pine trees, or mixtures of these two temperate types.<sup>950</sup>

Presently, this plant grows in soil conditions in those regions where forests grow. It grows in regions with long enough periods of spring, summer, and fall that permit forests to grow. It grows in regions where rainfall is plentiful enough to permit forests to grow. It grows in regions where the pH (acid-base) condition of the soil permits forests to grow. It grows in regions where the annual temperature range permits forests to grow. Thus, I maintain, forests grew on Spitsbergen, as Colinvaux explains in his chapter, "The Social Lives of Plants,"

“Plants grow up in communities. They grow up together in complex patterns. All plants have neighbors with whom there must be some accommodation or none would survive . . . plants grow up sharing the living space. The lives of plants in communities do not seem to be chance affairs, for we can see the same patterns of life repeating themselves over and over again. It is as if we are looking at the working of a social process: the social lives of plants.

“Any forest of a temperate land is made up mostly of just one or two kinds of trees that are overwhelmingly predominant; we can justly say that the forest is dominated by them. Other kinds of trees exist there, but they are likely to be scarce. There is also likely to be a host of other kinds of plants, of creepers, and bushes, and spring plants.”<sup>951</sup>

Thus, the present regions in Europe and Asia where flowering black crowberry grow are dominated by temperate forests. To grow on Spitsbergen during the hypsithermal, it would socially be in a habitat that also was dominated by forests.

Velikovsky informed us long ago, that trees were found on the “Ivory Islands in the Arctic Ocean,” [by D. Gath Whitley]. These islands today are polar deserts where

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<sup>948</sup>*Ibid.*, pp. 300-301.

<sup>949</sup>*Ibid.*

<sup>950</sup>*Ibid.*, p. 291 as compared with *Rand McNally World Atlas*, (Chicago, 1964), pp. 278-279.

<sup>951</sup>Colinvaux, *Why Big Fierce Animals Are Rare*, *op. cit.*, p. 63.

“neither trees nor shrubs, nor bushes exist.”<sup>952</sup> But he goes on to show that on the New Siberian Islands are “found . . . to consist of carbonized trunks of trees with impressions of leaves and fruits. . . . Toll found bones of mammoths and other animals together with the trunks of fossil trees with leaves and cones. ‘This striking discovery proves that in the days when the mammoths and rhinoceroses lived in northern Siberia, these desolate islands were covered with great forests, and bore a luxuriant vegetation.’”<sup>953</sup>

Charlesworth writes that during the hipisothermal:

“In north Siberia (including the New Siberian Islands) trees ranged 250 km [150 miles] farther north than now; peats in the treeless karsk tundra near the Kara Sea enclose remains of fir, pine, larch, birch, and alder. . . .”<sup>954</sup>

These hardwoods discussed earlier are of the deciduous variety, such as maples, oaks, etc.

During the present time, the only trees that grow on tundra are very tiny, slow growing ones. "The Arctic willow grows [there] not vertically but horizontally along the ground. . . . Like all cold-climate plants, they grow extremely slowly. One with a trunk a couple of centimeters [an inch or two] in diameter may well be over 400 or 500 years old, as its annual rings testify."<sup>955</sup>

As was pointed out below, spruce and birch tree trunks of full size with broad tree rings were found well above the Arctic Circle rooted in the soil of the Tuktoyaktuk Peninsula in Canada and the Lena River delta in Siberia adjacent to the Arctic Ocean. But today tall trees cannot grow in these regions for very basic reasons. Paul Colinvaux of Ohio State University explains why:

"Plant physiologists have suggested that part of the answer may lie in the short growing season in the very limited opportunities afforded a plant to make sugar with the energy of the sun. Arctic plants exist on very short commons, which means that they must be economical in spending their food calories. A tree has a large job to maintain an unproductive parasitic body of woody trunk and limbs. This may be just too expensive to be afforded by the income of calories that can be won in an arctic summer. No doubt this is part of the explanation, but it is not completely convincing. There are woody shrubs [not tall, thick trees] in the arctic such as the prostrate willow may have a very

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<sup>952</sup>Velikovskiy, *Earth in Upheaval*, *op. cit.*, p. 7.

<sup>953</sup>*Ibid.*, p. 8.

<sup>954</sup>Charlesworth, *The Quaternary Era*, Vol. II, *op. cit.*, p. 1488.

<sup>955</sup>Attenborough, *The Living Planet*, *op. cit.*, p. 63.

considerable mass of unproductive woody stem snaking flat along the ground. If a horizontal trunk can be maintained, why not a vertical one.

"The convincing answer comes from the work of David Gates ("Heat Transfer in Plants," *Scientific American*, Vol. 213, (1965), pp. 76-86). . . . Gates thinks of plants . . . as bits of mechanisms that must balance their heat budgets. A plant by day is staked out under the sun with no way of hiding or sheltering itself. And all day long it absorbs heat. If it could not lose heat as fast as it gained it, then it would heat up, be cooked, and die. Plants get rid of their heat by warming the air around them, by evaporating water, and by radiating to the atmosphere and the cold, black body of space. The plant adopts a working temperature that is a function of the rate at which it absorbs heat and the rate at which it gets rid of it again. It is absolutely vital that the plant be able thus to balance its heat budget at a temperature tolerable for the process of life.

"A plant in the arctic tundra lies very close to the ground in the thin layer of still air that clings there; but a foot or two above it are the winds of arctic cold. All the tundra plants together are absorbing heat from the sun tending to warm up, probably balancing most of their heat budget by radiating to space, but also warming that thin layer of still air that is trapped among them [or under a thin layer of snow which will protect them from the icy winds]. While they are close to the ground, they can balance their heat budgets. But if they stretched up as a tree does, they would lift their working parts, their leaves, into the streaming arctic winds. Then it is very likely that they would not absorb enough heat from the sun to avoid being cooled below a critical temperature. Your heat budget does not balance if you stand tall in the arctic. That is Gates' explanation for the absence of [tall] trees there. It is almost certainly correct."<sup>956</sup>

On the basis of this evidence tall, thick trees cannot grow in the arctic. The established view is that tall trees did not grow there at the same time that the mammoth lived in the far northern regions. However, in 1943 Stephen Taber wrote to describe trees found in the permafrost of Alaska. "On Quartz Creek bones of mammoth and horse were found with the trunks of large spruce trees, one of which is said to be 5 feet in diameter and 80 feet long."<sup>957</sup>

Sanderson also points out that, "forty-foot tree trunks have been found in the muck of Siberian Islands. . . ."<sup>958</sup> As pointed out earlier, Allen and Delair present the astonishing find in Greenland, some 200 miles north of the Arctic Circle, ". . . an ancient tree with a trunk, 'thicker than a man's body,' was found still standing erect on a hill at

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<sup>956</sup>Colinvaux, *Why Big Fierce Animals Are Rare*, *op. cit.*, pp. 56-57.

<sup>957</sup>Stephen Taber, "Perennially Frozen Ground in Alaska: Its Origin and History," *Geological Society of America Bulletin*, Vol. 54, (1943), pp. 1482-1483.

<sup>958</sup>Sanderson, *The Dynasty of ABU*, *op. cit.*, p. 83.

an elevation of 1,080 ft. . ."<sup>959</sup> This tree could only have grown after the Ice Age ended. Howorth reports that from eastern Siberia, which I repeat

"Herr von Ruprecht reported to Brandt that at the mouth of the Indiga, in 67° 30' N.L. [north latitude] on a small peninsula called Chernoi Nos, where at present only very small birch bushes grow, he found rotten birch trunks still standing upright of a thickness of a man's leg and the height of a man. . . .

"Besides these are to be seen in the most recent layers of the Yenissei tundra [of western Siberia] considerably north of the present limit of actual trees, *large tree stems* with their roots fast in the soil."<sup>960</sup>

The finding of tall, hardwood trees on the New Siberian Islands, and tall birches, spruce, and flowering crowberry bushes at these high altitudes suggest a different orientation of the poles. This evidence of tall trees with broad, annual tree rings is also corroborated by the fact that the people of Siberia could distinguish the difference between small trees that grew after the hipsithermal that had narrow rings, from those that grew during the hipsithermal that were tall and had broad rings. According to Howorth:

"As I have said, we have direct evidence that forests in the Mammoth age did exist very far north of their present limits. Such remains form an excellent thermometer by which to define the isothermal lines of that period, and I will now collect some examples of the remains of trees found underground on the tundras. They consist of two series, those which are the result of drift, and those which clearly grew on the spot. The shrewd observers who lived in Siberia long ago discriminated between these kinds, and gave the name of Noashima to those which have drifted, and of Adamshima to the indigenous timber, and this division is supported by Goeppert who separates the trunks of timber found in North Siberia into a northern series with narrow rings of annual growth, and a southern with wider ones."<sup>961</sup>

The concept that the broad ringed trees drifted into Siberia is an assumption. This evidence, I suggest, makes better sense in terms of Velikovsky's theory. In essence, there is clear evidence from dendrochronology that trees grew in the arctic when the mammoth lived there. Trees with narrow annual rings and narrow trunks grew after the hipsithermal when it was cold; trees with broad annual rings and thick trunks grew during the hipsithermal when it was warm. The fact that trees did not grow in Siberia during the

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<sup>959</sup>Allen, Delair, *When the Earth Nearly Died*, *op. cit.*, p. 248.

<sup>960</sup>Howorth, *The Mammoth and the Flood*, *op. cit.*, p. 67.

<sup>961</sup>Howorth, *The Mammoth and the Flood*, *op. cit.*, pp. 63-64.

Ice Age demonstrates that two types of trees grew there only after the Pleistocene ended, with broad annual rings during the hipsthermal and narrow rings thereafter which fully corroborates the concept Velikovsky proposed. The tall, broad trees rooted in the ground prove that, in fact, they grew there!

Large pine trees will grow up to the Arctic Circle and in rare places somewhat beyond it, but broad-leafed, deciduous trees cannot withstand the rigors of the cold north where pines thrive. They require more warmth and longer periods of warmth. The branch of botany which deals with where plants can and do grow is called plant geography or phytogeography. In general terms, H. A. Gleason and A. Cronquist explain the elements that determine the geographical range of large pine and broad leaf trees claiming that it is not determined by the cold of the dormant winter season which has relatively little effect,

" . . . but rather the length of the period during which a favorable temperature continues in summer. A tree must have temperatures above the freezing point to grow; and if it is to lay down new wood, produce dormant buds for next year's growth and ripen seeds for future generations, it must have a reasonable temperature for a reasonable length of time. The time is as important as the degree. The required duration and the necessary temperature have often been estimated by botanists, and it seems that temperature must average 50 degrees [Fahrenheit] or more for at least eight weeks, if forests are to grow."<sup>962</sup>

Nevertheless, it is well-known that even today, the tundra experiences freezes in the summer. We are told that the temperatures of the air in tundra regions does not meet the requirement of at least eight weeks above freezing. "By reason of its [temperature] occurrence where the growing season is short and where cloudiness and *periods of freezing temperature can reduce growth during the most favorable [summer] season*, tundra vegetation has low annual production."<sup>963</sup> (Emphasis added) While Kurten claims that the arctic season for flowering and growing can only produce vegetation which

" . . . consist of cushions of herbaceous perennials, mosses, and lichens, and annual grasses able to grow, flower, and set seed within a few months."<sup>964</sup>

Even Howorth was aware of the short growing season problem.

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<sup>962</sup>Henry A. Gleason, Arthur Cronquist, *The Natural Geography of Plants*, (New York, 1969), p. 99.

<sup>963</sup>"Tundra," *McGraw Hill Encycl. of Sci. and Tech.*, 6 ed., Vol. 18, (New York, 1987), p. 592.

<sup>964</sup>Kurten, *Prehistoric Animals and Their Hunters*, (London, 1968), p. 53.

"At Dudinsk, on the Lower Yenissei, Schmidt says vegetation does not begin to appear till the 16th of June, when the catkins of the willow, and some green leaves begin to thrust upwards through the snow. On the Yenissei Islands and the tundra he noticed no green till July, . . . On the tundra in the neighborhood of the Jyda, the summer lasted from the 13th of July to the 5th of August [23 days or a little over 3 weeks]. Even during this interval, he says in another place, there were constant north winds and frosts at night."<sup>965</sup>

What would happen to hardwood trees if they grew in the arctic presently?  
According to Kavalier, for temperate trees:

"Sudden extraordinary cold waves are even more dangerous. Completely unpredictable, these can strike in fall, winter, or spring [and in the high arctic in summer], with devastating effect.

"On November 10, 1918, the orchard growers of Iowa and Missouri were content as they looked over their leafy trees and watched the workers picking apples. The following morning, Armistice Day, [Veterans' Day] brought a blizzard and a sudden drop of temperature to zero and below. The men stood by helplessly as their trees died one after the other; three-fourths of the apple and pear trees in the area were destroyed. The peach, cherry, and plum trees were even more frail; only an occasional hardy specimen survived. Within the next fifty years, three more late autumn freezes decimated the orchards of the Pacific North West. . . ."<sup>966</sup>

Now, one can argue that this only proves that the hipsithermal was warm enough to permit tall trees to grow; it does not prove that the axis of the Earth was more perpendicular. But what we have yet to examine is related to the seasonality of tree growth discussed by Sanderson. And here, I'm afraid, claiming a warmer climate regime at the top of the world in the arctic basin will still not permit tall trees to grow with the present tilt of the poles. The obstacle that forbids large trees from growing well north of the Arctic Circle on Spitsbergen, Greenland, and the New Siberian Islands, and Alaska has to do with rather precise periods of light and darkness during the 24 hour rotation period of the Earth. Trees have evolved to respond biologically to the rhythm of night-day timing. This circadian rhythm determines the season for bud formation, leaf growth, flower formation, seed formation, and leaf falling. Each of these life processes for trees are triggered by fairly precise periods of diurnal light and darkness during the 24 hour day period; and photosynthesis also requires a dark reaction to operate. During the period of 24 hours of daylight, this reaction in certain trees will be constrained. The question is: How can trees that have evolved to respond to these fairly precise periods of

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<sup>965</sup>Howorth, *The Mammoth and the Flood*, *op. cit.*, p. 58.

<sup>966</sup>Kavalier, *Freezing Point*, *op. cit.*, p. 101.

light-dark signals, migrate in a thousand years or so into an environment where this photoperiodic rhythm will not fit their biological rhythms? Pielou explains:

*"An apparent obstacle to long, northward and southward migration of plants is the phenomenon of photoperiodism. As is well-known, many species of plants are genetically programmed to flower only when there are appropriate daylight hours during a twenty-four hour day. There are so-called long-day plants and short-day plants . . . they cannot flower until, as spring advances into summer, the length of the 'day' (that is, the number of daylight hours) has reached the required minimum. . . . Even when the spring is abnormally warm, they cannot be 'hurried' since their flowering is not controlled by temperature."*<sup>967</sup>  
(Emphasis added)

Actually, the more important requirement is related to the length of night. According to Dunbavin:

*"At latitudes between 23.5° and 66.5° lie the northern and southern temperate zones. Within these regions, the Sun can never be vertically overhead, but the [period of light-darkness and] intensity of insolation becomes increasingly seasonal with distance from the equator. . . . The number of daylight hours experienced also depends on the seasons. At a typical latitude of 50°, there are just over 16 hours of daylight at midsummer whereas only 8 hours experienced at midwinter. At 10° further north, this effect is even more pronounced, with about 19 hours of sunlight of the summer solstice, but only 6 hours at midwinter."*<sup>968</sup>

Above the Arctic Circle, given the present tilt of the Earth's axis, day-night periods change only occurs with great rapidity and increases rapidly until there is a 24-hour day of continuous light. This later suddenly reverses and the daylight period decreases to a 24-hour period of continuous darkness. Edith Taylor, a paleobotanist at Ohio State University, emphatically claims one cannot "find trees growing in a warm environment with . . . [a] light regime . . . [of] 24 hours of light in summer and 24 hours of darkness in winter."<sup>969</sup> William R. Corliss seconds this stating, "trees found buried in the Arctic muck could never have grown where found due to the long polar darkness."<sup>970</sup>

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<sup>967</sup>Pielou, *After the Ice Age, op. cit.*, p. 101.

<sup>968</sup>Dunbavin, *The Atlantis Researches, op. cit.*, p. 83.

<sup>969</sup>*Discover the World of Science*, (Feb., 1993), p. 17.

<sup>970</sup>William R. Corliss, *Science Frontiers*, (Glen Arm, MD, 1994), p. 173.

What becomes quite clear is that tall trees cannot grow very far north of the Arctic Circle with the present tilt of the Earth's axis no matter what the temperature is. Deciduous tall trees begin bud growth at 45° latitude in late March to early April, and begin to drop their leaves in late October to early November. They enjoy anywhere from 5 to 6 months in which to bud, flower, produce seeds, and grow before dormancy sets in. Above the Arctic Circle, they would have only about a month to carry out all of these photoperiodically triggered behaviors, which would be clearly impossible with the present tilt of the Earth's axis, no matter what the temperature is. That is why tall trees cannot grow there given the present alignment of the poles.

In fact, the very same question must also be posed for certain temperate trees that grew well south of the Tropic of Cancer into the heart of the Sahara Desert and the other deserts. They, too, would require very specific temperatures, as well as precise triggering of photoperiodic signals to grow far outside their present temperate ranges.

Tall temperate trees cannot grow well beyond their present ranges unless the geography, climate, light duration, and rainfall are each rearranged, or unless the trees undergo rapid evolutionary change so that they can adapt to different geographical and climatological conditions. As Gleason and Cronquist point out, "plants are usually right up to the limit of their environment and cannot move further until it changes."<sup>971</sup> Paul S. Sears comments that as far as he knows,

". . . no single species of plant or animal . . . can transgress very far beyond its characteristic climate range unless it undergoes evolutionary changes that in turn set new limits. For this phenomenon, there are good and sufficient reasons to be found in physiology which finds for each species its range of tolerance in respect not only to the several factors of climate, but to their combinations and rhythmic patterns."<sup>972</sup>

Yet, as has been shown below, tall trees did grow hundreds of miles north of the Arctic Circle. The tall tree in the Lena Delta bog was over 400 miles north of the Arctic Circle; the tall, thick still standing trunk on the peninsula in Canada was 200 miles north of this boundary. And the tall trees found on the New Siberian Islands some 650 miles north of the Arctic Circle suggest a large poleshift. Although no tall trees have been found on Spitsbergen, the black crowberry bush found there with ripened berries derived from flowers, which can only do so in temperate regions with photoperiodic signals, indicates that there were forests there 850 miles north of the Arctic Circle. If tall trees grew on the New Siberian Islands, at a minimum, temperate zone photoperiodic conditions existed over a 1,000 miles north of where they presently occur. A 1,000 mile difference suggests that the obliquity of the pole was, at a minimum, 14.4° more

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<sup>971</sup>Gleason, Cronquist, *Natural Geography of Plants*, *op. cit.*, p. 92.

<sup>972</sup>Paul S. Sears, "Climate and Civilization," *Climate Change*, H. Shapley ed., (Cambridge, Mass., 1960), p. 36.

perpendicular than it is today, which means the tilt of the pole to the plane of its orbit was only about 9° instead of today's tilt of 23.5 degrees.

Furthermore, photoperiodism not only is an essential factor in the development of trees, but is of fundamental importance to many mammals for annual circadian behavioral patterns such as mating and molting, etc. François Bourlière, in *The Natural History of Mammals*, in his chapter on the importance of light-dark rhythms during the year, states

"Light. This factor, still little studied, affects the ecology of mammals in many ways. Daily variations in light intensity are fundamental to the nycthemeral or day-and-and-night rhythm of most species. Diurnal mammals become active at sunrise or sometimes a little before. . . . Their activities go on all day and come to an end at twilight. . . .

"Twilight and nocturnal species have a contrasting rhythm of activity. The European badger, for example, carefully studied by Neal, does not emerge from its burrow until after sundown, and the time of emergence in summer is later than in autumn or spring. Other facts, such as temperature and periods of full moon, may cause slight variations in this rhythm, but intensity of sunlight remains dominant."<sup>973</sup>

Now the American badger is not that different than its European cousin. But it lived in Alaska in areas, according to Guthrie, north of the Arctic Circle, as did the ferret.<sup>974</sup> How was it to regulate its photoperiodic rhythms during the months of total darkness or during the months of total daylight. All its light driven behavior would be out of rhythm and it would not function unless it received the same or very similar periods of light intensity that it receives presently in the United States, which demands that the geographic pole was much more perpendicular to the plane of the ecliptic to allow for this functioning.

Bourlière goes on to explain:

"*Variation through the year* in the length of the days may be even more important, and its effect upon the reproductive period. . . .

"Artificial lengthening of the day can cause the gonads to mature out of season in some mammals. The experiment was performed by Bissonnette on the ferret, from October to March, and he observed an increase in the size of the testes during this period, which is normally the time of testicular involution.

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<sup>973</sup>François Bourlière, *The Natural History of Mammals*, 3ed., revised, (New York, 1964), pp. 261-263.

<sup>974</sup>Guthrie, *Frozen Fauna of the Mammoth Steppe*, *op. cit.*, p. 249.

Spermatozoa were produced by the experimental animals three month earlier than would ordinarily be the case."<sup>975</sup>

Then what of those ferrets living in Alaska above the Arctic Circle that would receive 24 hours of light for several months? This would play havoc with their reproductive cycles. However, if the poles were much more perpendicular, the light rhythms upon which their reproductive cycle depended would be the same as they are for these ferrets, as they do today in the United States, where they presently live. If they mated out of season, their offspring would have been born out of season and would probably not survive to maturity.

Two of the animals that lived in the arctic with the mammoth were mountain deer and four-pronged antelope.<sup>976</sup> It is a well-known fact that deer and antelope have a rutting or mating season in early autumn (September-October), so that the offspring are born in early spring (March-April). This occurs because these infant herbivores must be born in spring for their mothers to find sufficient green vegetation upon which to regain their strength after a strenuous winter having given up much of their organic material for the development of the offspring. The spring growth gives the mothers sufficient nourishment to resupply their needs and their newborns with milk. But with the present tilt of the Earth, the mating cycle would be out of phase with the seasons and the offspring would be born out of season also. This would play havoc with these ungulates' life cycles. The gestation periods of large antelopes and large deer fall within a relatively narrow range. One cannot expect that the gestation period also changed (evolved) during the Ice Age to allow these mammals and others to function in the high arctic when the seasons would be so deranged. The reindeer have to migrate south, where all trees grow in autumn, to receive the proper photoperiodical signal to mate.

Finally, we come to the same geological and meteorological problem that we encountered regarding wind patterns and rainfall patterns that we ran into for trees to grow in the desert belts round the Earth during the hipsithermal. Not only do tall trees such as birches and spruce require warm temperatures, long growing seasons, and fairly precise photoperiodic cycles; they also require sufficient rainfall throughout the year and meteorological conditions to bring this condition about. About 8,000 years ago with the present axial tilt of the Earth, the weather patterns in the Arctic basin should have been similar to the weather patterns that exist there today. As we were told, the arctic basin is a desert which received little or no rainfall each year and that its summer surface water is the permafrost which does not run off but remains all across the arctic in bogs. The reason that there is little rainfall in the arctic is that cold air does not hold much water vapor. In essence, the arctic basin is a desert, just like the Sahara. Gribbin explains:

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<sup>975</sup>Bourlière, *The Natural History of Mammals*, *op. cit.*, pp. 263-264.

<sup>976</sup>Bruck Bower, *Science News*, *loc. cit.*

" . . . circulation patterns can be related to the distribution of high and low pressure systems around the world, and to regions of high and low rain fall. Some of the Sun's heat—a great deal of it—goes not just into warming the surface of the Earth in the tropics, but into evaporating water. So the hot air rising in the tropics is not just hot, but moist as well, and one result of the cooling of this rising air is that the moisture goes back into the form of water droplets, giving up heat as it does and so making clouds from which tropical rain falls. Roughly speaking, rising air is associated with rain, and that is why the tropics are wet and covered with lush vegetation. Conversely, where the airflow is mainly downward, moisture is taken up by the airstream as it is warmed and compressed. The downward flow causes a pileup of air at the surface, increasing the atmospheric pressure; so that the overall effect is that regions of descending air are both dry and dominated by high pressure systems. The deserts of the U. S. Southwest, the Sahara, and other arid regions around the world are typical products of this feature of atmospheric circulation, *and although we are not used to thinking of them as deserts, the dry, cold regions over the poles are produced in exactly the same way.*"<sup>977</sup> (Emphasis added)

Therefore, since we have tall, temperate trees growing up beyond the Arctic Circle to the shores of the Arctic Ocean and, as I suggest, on Spitsbergen, though not found, but are found on the New Siberian Islands 650 miles north of the Arctic Circle, surely trees of decent height grew on Spitsbergen 250 to 300 miles farther north during the hipsithermal. These forests required rainfall throughout the year. They, in fact, needed an average of about 40 inches annually. We are specifically informed, "the assemblage of deciduous hardwoods which includes maples, oaks, beeches, elms and BIRCHES occurs in temperate climates having warm summers, cold winters, and an average yearly rainfall of 92 centimeters (40 inches)."<sup>978</sup> Today, in fact, "the annual precipitation in the arctic is less than in some desert areas."<sup>979</sup> (Capitalization added)

Not only does this pole shift/plate tectonic shift explain how large trees could grow with abundant sunlight and rainfall, but it explains how the mammoths and all the other magaherbivores would be able to find sufficient water resources all year. Under present winter conditions, surface water freezes several feet to form a solid wall of ice over rivers, lakes, etc. As Bourliere explains:

"For land mammals water is first of all an essential element in metabolism. . . ."

"Some mammals drink a great deal and in consequence are practically restricted to habitats that provide free water in sufficient quantity. Many African

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<sup>977</sup>Gribbin, *Future Weather, op. cit.*, p. 68-69.

<sup>978</sup>*Encyclopedia Britannica, Macropedia*, Vol. 13, (Chicago, 1982), p. 907.

<sup>979</sup>Orr, *Between Earth and Space, op. cit.*, p. 155.

herbivores, for instance, regularly visit water holes or other sources each day at a fixed hour, often coming from considerable distances."<sup>980</sup>

Haynes shows what would happen to mammoths that drink water that is near freezing or snow.

"The mammoth's hair functioned to maintain body temperature, of course, which in modern Asian elephants is around 36-37°C, . . . Perhaps one of the most important functions of the hair coat was to prevent heat loss after mammoths drank water, which may have been relatively chilled in the cooler conditions of the Pleistocene. [F.] Benedict found that "Jap," a native Asian elephant, tolerated cool temperatures (~12°C) without discomfort, but after she drank water (even at a temperature of around 23°C) [which is about 72°F or comfortably warm] she shivered and was chilled. A considerable amount of body heat was used to warm the water in her body. Mammoths would have needed water often, as do all elephants, and if it was frozen or in the form of snow, would have put a great burden on the body, which a thick hair coat could have reduced."<sup>981</sup>

He further points out that mammoths might have been able to drink cold water, but then comes the problem of getting it, and mammoths would suffer from thirst in winters<sup>982</sup> similar to drought in Africa during the dry season. But what about all the other animals. They, too, would need water daily; and in a frozen desert, this would be a problem. However, during the hysithermal, none of these problems would be as severe and the animals, as well as the trees and other vegetation, would have adequate supplies of this most "essential element" all year. Freezes would not last all winter allowing intermittent thaws to melt the surface and lake and river ice. The question of water simply vanishes with the mammoths and all the other animals inhabiting the far north during the hysithermal.

Related to the requirement for greater rainfall in the arctic as in the desert belts is the condition of evaporation with a more perpendicularly oriented axis. If the temperature of the arctic atmosphere and Arctic Ocean is higher and more uniform, then it must follow that there would be greater evaporation of Arctic and Atlantic Ocean waters lifting much more moisture into a warmer atmosphere which could hold this greater water vapor content. Moisture would then be carried zonally or via Hadley cells over the continents to supply rain to temperate trees and other vegetation. But of greatest

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<sup>980</sup>Bourliere, *The Natural History of Mammals*, *op.cit.*, p 257.

<sup>981</sup>Haynes, *Mammoths, Mastodons and Elephants* *op.cit.*, p 33.

<sup>982</sup>*Ibid.*, p. 308.

significance is that, under such conditions, this rainfall would be a year-round phenomenon.

Added to this is the factor of evapotranspiration. Not only does increased warmth induce higher evaporation rates and atmospheric moisture, but also higher evapotranspiration of water vapor in spring, summer, and fall from the leaf pores of deciduous trees and bushes. A deciduous forest exposes four times the leaf surface to the sun's heat than does land.<sup>983</sup> A forest on an area of arctic land would evaporate much more water vapor to the atmosphere than grass land. During the spring, summer, and fall seasons, when deciduous trees would be in full foliage, their contribution to the water vapor via evapotranspiration to the atmosphere would permit rain to fall farther inland in the more remote regions of Asia and North America. These fundamental processes further explain why the arctic was able to bloom during the hipsithermal. The same process would of course also have operated in the great desert belt to the south allowing them to bloom in this moist environment.

Schultz tells us the, "Antarctic ice dome today, in terms of precipitation received, is the driest large area on Earth, drier overall than any large desert."<sup>984</sup>

Again, the only way to bring year round rainfall to this area is by either a different axial tilt or plate motion to reposition the continents. To achieve these conditions requires catastrophic, global changes. Lamb also noted these extraordinary wind and rainfall patterns for the far north during the hipsithermal.

". . . [N]orth in Europe and Asia the history of moisture variation was different [from that of the present] and seems related to the variation of strength and zonality of the general atmospheric circulation. . . . [W]ind flow seems to have become increasingly w[ester]ly and stronger, bringing more rainfall from the Atlantic, particularly in the winters, across all northern Europe and on into Asia north of the great mountains."<sup>985</sup>

Again the winds, instead of strongly blowing north and south as they do today, during the optimal warm period, blew west or zonally, carrying the moisture-laden air off the warm Atlantic "particularly in the winter" across all northern Europe and on into Asia, which is just what one would expect to find if the temperature difference between the poles and the equator was greatly reduced because the tilt of the Earth's axis was much more perpendicular.

When did these northern forests cease their existence? According to Lamb "The farthest northern extensions of the forests in the continental sectors, in both North

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<sup>983</sup>Robert E. Ricklefs, *Ecology*, 2 ed. (New York, 1984), pp. 47-48.

<sup>984</sup>Schultz, *Ice Age Lost*, *op. cit.*, p. 72.

<sup>985</sup>Lamb, *Climate, History and the Future*, *op. cit.*, pp. 389-399.

America and Eurasia, are dated . . . between about 3,000 and 1,500 B.C. . . . Nichols (1970) deduced from pollen diagrams for the Northwest Territories that the onset of cooler summer in northern Canada may be dated about 1,500 B.C., in good agreement with the time of change indicated in Greenland and elsewhere."<sup>986</sup>

Before leaving this topic, I should like to say a few words about vegetation in Antarctica. The same problem regarding trees pertains to that continent, as well. According to Corliss,

"Something is wrong with our recent history of Antarctica. Conventional wisdom insists that the continent has been ice covered for over 15 million years. But now Peter Webb and his co-workers have found pollen and the remains of roots and stems of plants in an area stretching some 1,300 kilometers [800 miles] along the Transantarctic Mountains. The Antarctic wood is so recent that it floats and burns with ease [just as in the Arctic].

"Webb's group postulates that a shrub-like forest grew in Antarctica as recently as 3 million years ago. The dating, of course, is critical, and is certain to be subjected to careful scientific scrutiny. Nevertheless, these deposits of fresh-looking wood do suggest that trees recently grew only 400 miles from the South Pole. Also of interest is the fact that the sedimentary layers containing the wood have been displaced by as much as 3,000 meters [3,300 yards] by faults, indicating recent large-scale geological changes."<sup>987</sup>

Naturally, the estimate of the age of the Antarctic scrub forest has been pushed back in time. The bottom of a continental glacier is made up of very soft, snowy material which makes the ground beneath it moist. Glaciers actually maintain the soil beneath them at a relatively warm temperature, as opposed to permafrost. Wet ground would cause the wood material to become extremely soft and water logged in a relatively short time. Yet in spite of these conditions, the Antarctic wood is burnable and floats just as it does in the tundra of Siberia. Something is out of order in terms of uniformity regarding the assumed three million year age of this wood. Again, I suggest that to have this condition of wood in Antarctica requires that the poles were placed elsewhere recently. Three million years ago Antarctica was almost exactly where it is today, based on plate tectonics.

If this is indeed the case, as the evidence suggests, one must ultimately ask: What will change the orientation of the polar axis or cause the Earth's crust to suddenly slide over the mantle? Neither comets, as observed today, nor their streams of debris, have the mass and energy necessary to affect such monumental changes. Asteroids are also

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<sup>986</sup>Lamb, *Climatic History and the Future*, *op.cit.*, p. 417.

<sup>987</sup>William R. Corliss, *Science Frontiers*, Glen Arm, Md, 1994), p. 220; see also, S. Weisbud, "A Forest Grows in Antarctica," *Science News*, Vol. 129, (1986), p. 148.

generally too small. But if the cause was that of a gigantic comet or asteroid, where is the tremendous crater it recently excavated?

The decisive dilemma for the impact theory of extinction was delineated by Raup.

"Crater size is also a problem [for mass extinction theory] because insufficient attention has been given to two large craters that lack associated extinctions. They are the Montagnais Crater on the continental shelf off Nova Scotia, and the Tookoonooka Crater, in Queensland, Australia. Montagnais is 45 kilometers (21 miles) in diameter and dated at 51 ma [million years ago] BP and Tookoonooka is 55 kilometers [33 miles] and dated at 128 ma BP. Both are considerably above the 32-kilometer [19 mile] cut-off that has been used as the lower limit of significant biological effects. Yet neither has any distinctive extinction associated with it—unless one were to claim a near-match of Tookoonooka with the end Jurassic extinction . . . by going back to the 1982 Harland time scale.

"Even one large crater [such as the Montagnais Crater] without an associated extinction is a decisive contradiction. If, as is argued, energy release from a large impact is bound to devastate large numbers of species, then extinctions should be associated with *all* large impacts, not just most or some. This is one instance where conventional, statistical reasoning has no place."<sup>988</sup>

None of the modern uniformitarian or catastrophist theories based on comets or asteroids will generate large enough forces that would account for the energy requirements of such an immense reorientation of the globe. That proposed by Velikovsky does.

All in all, there are numerous factors that indicate that the position of the axis of rotation of Earth has changed. The factors significantly corroborate poleshifts and each other. Expansion of the temperate zone is indicated by temperate vegetation migrating both north and south. Photoperiodism is required to explain not only tall trees and black crowberry bushes growing well north of the Arctic Circle, but for badgers, ferrets, and deer to carry on photoperiodic driven behaviors. Weather patterns after 8,000 years before the present should have ushered in a climate similar to that found today, but it did not. The evidence suggests quite unambiguously that there were poleshifts in historical times. The evidence is there, but uniformitarian researchers have been unable to accept that evidence because such a concept is so completely antithetical to everything they believe, and everything they have learned at the knees of mentors, who learned uniformity from their teachers. The possibility that they have been indoctrinated into their gradualist system, rather than educated into it, will never occur to them. Thus, they must reject this evidence that so clearly and comprehensively overthrows their paradigm.

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<sup>988</sup>Raup, *Extinction, Bad Genes or Bad Luck?*, *op. cit.*, pp. 177-178.

## ICE AGE THEORY - UNIFORMITARIAN OR CATASTROPHIST?

The cause of the Ice Age is yet another unexplained dilemma that has not been resolved over the past century. As Schultz expresses it,

"... with a wealth of scientific tools and the ability to explore anywhere on Earth . . . , still we have not been able to explain *why* the Ice Age occurred. There must be a hundred theories but they all have 'holes' or lack substantiation, and none can be proved. Not one commands anything like general acceptance."<sup>989</sup>

In fact, Louis Agassiz, the main developer of the concept, (others had preceded him) was himself at a loss to explain its cause: "We have as yet no clew [sic] to the source of this great change of climate."<sup>990</sup> In 1929, A. P. Coleman wrote,

"Scores of methods of accounting for ice ages have been proposed and probably no other geological problem has been so seriously discussed by glaciologists, by meteorologists and biologists; yet no theory is generally accepted. The opinions of those who have written on the subject are hopelessly in contradiction with one another, and good authorities are arrayed on opposite sides."<sup>991</sup>

In 1953 Charlesworth also admitted:

"The cause of these [Ice Age] changes, one of the greatest riddles in geological history, remains unsolved, despite the endeavors of generations of

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<sup>989</sup>Schultz, *Ice Age Lost*, *op. cit.*, p. 67.

<sup>990</sup>Louis Agassiz, *Geological Sketches*, Vol. I, (Boston 1866), p. 21.

<sup>991</sup>A. P. Coleman, *Ice Ages Recent and Ancient*, (New York, 1929), p. 246.

astronomers, biologists, geologists, meteorologists, and physicists, it still eludes us."<sup>992</sup>

Schneider and Londer suggest, "There are many parallels between the theories explaining recent ice ages and those explaining the great dying [extinction]. The possible causes offered for glacial/interglacial episodes of the Pleistocene have been as numerous as the biblical plagues."<sup>993</sup>

Like the question of the extinction of the megafauna at the end of Pleistocene, this problem of the cause or causes of the Ice Age is also unsolved and enmeshed in scientific and scholarly conflict. For anyone who reads a good sampling of these theories in Velikovsky's *Earth in Upheaval*, Schultz's *Ice Age Lost* or Silverberg's *The Challenge of Climate*, or elsewhere, one learns of highly implausible and often impossible theories. But scientists, being unable to admit their uniformitarian explanations have all failed, have created yet another modern theory to explain how to bring on an Ice Age. One researcher puts the explanation thus:

"An ice age is not related to a general cooling of Earth. The key to the beginning of an ice age is the amount of sunlight reaching high latitudes in summer, not winter, because snow accumulates even during a mild winter while cool summers are needed to preserve snow."<sup>994</sup>

This interpretation is based on the Milankovitch theory which is assumed to explain the onset and ending of Ice Ages. In 1842 in Paris, Joseph Alphonse Adhemar understood that the Earth's orbit, was an ellipse, realized it passed through points closest and most distant from the Sun—closest in early January, farthest in early July. This would cause solar warmth to either heat or cool one hemisphere of the Earth alternately when the planet was closest or farthest to this source. But these points shifted gradually over thousands of years to eventually exchange their position with relationship of Earth to the Sun.

Thereafter, in 1843, Urbain LeVerrier, the French discoverer of the planet Neptune, further understood that the shape of the Earth's orbit also varied over a period of about 100,000 years. Its orbit gradually becomes highly circular due to the influence of its surrounding celestial bodies and then slowly forms a more elliptical one. This change would also influence the amount of sunlight that reaches the Earth.

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<sup>992</sup>J. B. Charlesworth, "The Ice Age and the Future of Man," *Science Progress*, Vol. XLI (Jan., 1953), p. 3.

<sup>993</sup>Schneider, Londer, *The Coevolution of Climate and Life*, *op. cit.*, pp. 252-253.

<sup>994</sup>C. Leroy Ellenberger, "Still Facing Many Problems," *KRONOS*, Vol. X, No. 3, (Summer 1985), p. 2.

In 1872, James Croll of Scotland, added a third component of the Earth's celestial orientation which affects how much solar energy it receives from space. In his book, *Climate and Time*, he showed that the angle of tilt of the terrestrial axis varies from an angle of 21.8 to 24.4 degrees.

In the early part of the 19th century, Milutin Milankovitch incorporated all these cycles and was able to propose that these motions of the Earth in its orbit acting in concert clearly explained the onset and end of Ice Ages.

The sea cores have suggested that Milankovitch was correct and many scientists have jumped onto this bandwagon. However, as we will see, the Milankovitch theory, which posits that cool summers which would permit winter snows to survive through summer and collect additional snow to gradually build up continental-sized ice caps at or near the polar regions, simply fails.

The first reason for this failure is fairly obvious. According to Schneider and Londer, the time elapsed since the onset of "the Quaternary [is] . . . 2-million-to-3-million year[s]. . . ." <sup>995</sup> Therefore, the great continental ice caps formed only over the past two to three million years in North America and Europe. But, based on plate tectonic theory, these continents were in their present positions for at least the past ten to twenty million years; they were at most 300 to 450 kilometers or 180 to 240 miles south by southwest of their present locations. If the great ice sheets were formed by uniformitarian processes, based on Milankovitch cycles, then there had to have been Ice Ages for the past fifteen to twenty million years. Plate tectonics and Milankovitch cycles require this with the continents in nearly the same positions as they are currently and with the three astronomical Milankovitch cycles operating regularly, based on uniformitarian theory Ice Ages should go back beyond two to three million years. As Paul A. LaViolette remarks, plate tectonic theory does ". . . not explain why the Earth was relatively free of glacial cycles as recently as [even] four or five million years ago when land masses were not far from their present positions. If the continents' positions [with Milankovitch cycles] were the cause [of Ice Ages] why didn't the present ice epoch begin much earlier?" <sup>996</sup>

This is corroborated by I. Winograd and J. M. Landwehr who showed that in the distant past, no Ice Ages occurred related to Milankovitch cycles, especially in the Pliocene. Instead of exceptionally cold climates due to Milankovitch, it was "a period of exceptional global warmth." <sup>997</sup>

With respect to plate tectonic theory and Milankovitch cycles, as opposed to Velikovsky's theory, we can see that the former theory cannot explain why the earlier

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<sup>995</sup>Schneider, Londer, *The Coevolution of Climate and Life*, *op. cit.*, p. 32.

<sup>996</sup>Paul A. LaViolette, *Earth Under Fire*, (Schenectady, N.Y., 1997), p. 132.

<sup>997</sup>I. Winograd, J. M. Landwehr, "A Response to 'Milankovitch Theory viewed from Devil's Hole' by J. Imbrey, A. C. Mix and D. G. Martinson," *U.S. Geological Survey Open-File Report 93-357*, (Reston, VA., 1993), p. 5.

period had no Ice Ages. Velikovsky's theory suggests that Ice Ages are brought about by catastrophes and therefore, he does not demand Ice Ages except when certain types of cataclysms occur.

Therefore, the argument that the causes of the Ice Age are understood as a disproof of Velikovsky's theory is not only specious, but entirely ignorant. Modern research over the past thirty years shows that what Velikovsky's critics presented to support their uniformitarian model of the Ice Ages is obsolete because it was based on a lack of knowledge and understanding of the scientific evidence.

Louis Agassiz, who proposed the theory of Ice Ages in the last century, had concluded that their onset must have been sudden and catastrophic:

"A sudden intense winter was to last for ages, fell upon our globe; it spread over the very countries where these tropical animals had their homes, and so suddenly did it come upon them that they were embalmed beneath masses of snow and ice without time even for decay which follows death."<sup>998</sup>

In fact, certain modern scientists were forced to suggest that snow literally fell in great blizzards to cover immense regions of the north at one fell swoop in catastrophic fashion to start an Ice Age. Nigel Calder describes this snowblitz concept:

"In the snowblitz the ice sheet comes out of the sky and grows, not sideways, but from the bottom upwards. Like airborne troops, invading snowflakes seize whole countries in a single winter. The fact that they have come to stay does not become apparent though until the following summer. Then the snow that piled up on the meadows fails to melt completely. Instead, it lies through the summer and autumn, reflecting the sunshine. It chills the air and guarantees more snow next winter. Therefore, as fast as snow can fall, the ice sheet gradually grows thicker over a huge area. . . . The cold comes instantly, but then the snow piles up for 5,000 years at perhaps 18 inches a year. 'Instantly' may mean a hundred years or a single bad summer. So ice ages can start very suddenly. . . ."<sup>999</sup>

Of course, no mention is made of the fact that this whiteout will inhibit further snowfall and will melt the second summer. One can see the catastrophic concepts scientists have been forced to employ to explain the onset of an Ice Age. But all that has been presented thus far are concepts unsupported by physical evidence to uphold these Ice Age suppositions. If, on the other hand, Velikovsky's catastrophic concept of a recent

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<sup>998</sup>Edward Lurie, *Agassiz: A Life in Science*, (Chicago, 1960), p. 98.

<sup>999</sup>Nigel Calder, *The Weather Machine*, (New York, 1974), pp. 118-121.

Ice Age is correct, then there should exist unambiguous, observed evidence to buttress his case.

Velikovsky claimed that the Ice Age ended catastrophically about 8,500 years ago by a poleshift and probably a sudden plate tectonic movement.

The question is, how does one prove the Ice Age ended 8,500 years ago and not as presented, 12,000 or 13,000 years ago? At the German Annual Scientific Meeting held in 1998, a scientific paper was presented by a forest botanist, Menting. The problem he tried to explain was the long period between the accepted end of the Ice Age and the reforestation of Europe. If the ice melted away, say 12,000 years ago, based on the present nature of carbon 14 dating, which this author has shown earlier would actually date much closer to the present, then Europe should have been reforested around the same time. Based on ecological studies, it is well-known that it takes from about 60 to 100 years for various plant communities to prepare a bare landscape for the climax community, the permanent forest to dominate the region. But, what Menting was attempting to do is explain why, instead of taking about 100 years for forests to regrow over Europe, it took instead 1,000 to 2,000 years for this ecological process to occur. This is ten to twenty times longer than nature would allow, based on basic ecology. Although this does not fully prove the date presented by Velikovsky, it does, however, show that the Ice Age ended 1,000 to 2,000 years closer to the present than is presented in the literature. I thank Professor Gunnar Heinsohn, who attended this meeting, for passing along this well-known evidence to me.

Modern science presents the view that the end of the Ice Age was controlled by gradual processes which took thousands of years to complete. Nevertheless, Pielou admits that change from the Ice Age climate to that of the Holocene was an "abrupt change" and, "At some sites it happened in less than a human lifetime. . . ." <sup>1000</sup> Therefore, what would one expect to find based on Velikovsky's theory as opposed to that of the uniformitarians? If there was a sudden global tilting of the Earth's axis accompanied by massive, sudden crustal motions, then the ice caps would have been shaken and broken loose from their moorings to slide into the seas from the adjacent lands. Based on the center of the ice cap location during the last Ice Age, the north pole was situated somewhere to the northeast of Hudson Bay and the south pole was located well into the Indian Ocean. Hence, Antarctica would not have had much of an ice cap, if any at all. Therefore, the evidence of sudden sliding of the ice cap from the continents should only be found in the Atlantic Ocean in the northern hemisphere. And that, in fact, is precisely the case. While great layers of continental debris are found all over the North Atlantic, (as will be discussed below), there are no such layers found in the sediments of the south Pacific, south Atlantic, or south Indian Oceans. If, indeed, there is undeniable evidence of massive layers of continental detritus caused by the sliding of the north hemispheric Ice Age ice cap in the Atlantic, why are there no such layers in the oceans in the southern hemisphere closer to Antarctica? The implication is quite clear. The ancient ice cap in Antarctica did not exist at that time.

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<sup>1000</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 229.

Evidence that the great ice sheet of the northern hemisphere suddenly broke up and slid into the oceans is found all across the North Atlantic Oceans as far south as Spain. The evidence is found in the form of enormous amounts of detritus gouged from continents and dropped by a stupendous flotilla of ice bergs onto the ocean floor. This material has indeed been discovered as distinct layers of heavy continental rock covering the sea bed of much of the North Atlantic called Heinrich layers, and about six or seven such layers are presently known.

In order to explain this continental material by uniformitarian processes, scientists suggest that the base of the ice sheet contained soft, muddy material which acted as a lubricant to permit a sudden catastrophic slide. This process may have occurred in small isolated regions, but the evidence makes it clear that the entire ice sheet moved, as explained by Mark Maslin who pointed out that "sediment deposited by icebergs in the Labrador Sea . . . [contained] rocks of the type found in the middle of the North American continent, as well as at its edge."<sup>1001</sup>

Douglas MacAyeal, a researcher, suggested that the buildup of the ice sheet and subsequent surges between Heinrich events take 7,000 years.<sup>1002</sup> However, there is also evidence from Iceland and South America that, during the last Heinrich event, the great glaciers in these regions broke up and moved violently, as did the glaciers of North America.<sup>1003</sup> But if these immense catastrophes occurred to the North American ice cap and those great glaciers of Iceland and South America, then the same had to happen to the ice cap over Greenland. One does not break up at the same time the continental glaciers of North America and the great glaciers of Iceland and South America without doing the same to Greenland's glaciers. Therefore, if the Heinrich events occurred in the Atlantic Ocean, as clear evidence for them exists, then this evidence should also be corroborated by evidence on the continents. Such a catastrophic slide of the ice cap should leave clear impressions on the ground over which it moved with such violent rapidity. This is now considered a valid possibility, based on the work of John Shaw, of the Department of Geography at Queen's University, Kingston, Ontario.

Shaw claims that the drumlin fields, whole regions in the northern hemisphere, covered by many long hills a few hundred feet high, with their long slopes facing the ice sheet and the short slopes facing away from the ice sheets, were suddenly created by immense subglacial floods, so that entire sections of the ice sheet were literally lifted and moved southward, carving innumerable drumlin fields across the northern hemisphere.<sup>1004</sup> Isaac and Janet Asimov describe the research thus:

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<sup>1001</sup>Mark Maslin, "Waiting for the Polar Meltdown," *New Scientists*, (Sept. 4, 1993), p. 39.

<sup>1002</sup>*Ibid.*, p. 40.

<sup>1003</sup>Richard Monastersky, "Staggering Through the Ice Ages: What Made the Planet Caren Between Climate Extremes?" *Science News*, Vol. 146, (July 30, 1994), pp. 74-76.

<sup>1004</sup>John Shaw, "Drumlins, Sub-glacial Melt Water Floods and Ocean Responses," *Geology*, Vol. 17, (Sept. 1989), pp. 853-856.

". . . [I]n 1975, Casare Emiliani of the University of Miami studied the fossil remnants of microscopic organisms under the sediments of the floor of the Gulf of Mexico. From his studies, he concluded that . . . [11,000] years ago . . . the Gulf of Mexico contained water that was much less salty than it is today. He suggests that the ice sheets had undergone sudden melting and that a vast flood of water had entered the Gulf of Mexico and raised the sea level markedly.

"The suggestion was largely ignored because it was difficult to imagine the ice melting that fast, but in 1989, John Shaw . . . made a suggestion as to just how such floods might come about.

"The region where once the ice sheets were found have a scattering of low hills called 'drumlins.' These are usually supposed to have been formed by [the] grinding action of glaciers as they came and went. Shaw, however, feels [that] they may, more easily, have been formed by a rush of water.

"He suggests that the ice sheets did indeed melt very slowly, but that the water did not necessarily run off, soak into the ground, pour into rivers and reach the seas as rapidly as it formed.

"Instead, water might have slowly settled down to the bottom of the ice sheet, soaked into the ground till it reached the bedrock and slowly accumulated there. There would thus form what was essentially, a lake of water under the ice sheet, and this would be prevented by ice dams from spreading outward.

"Eventually, though, as the glaciers continued very slowly to melt, sections of the ice dam would weaken and then break. The lake of ice water that had been pent up would then pour out seaward in a vast flood that beggars anything we can imagine.

"Shaw has calculated that something like [20,000] cubic miles of water may have poured out of the ice at once to form the drumlin fields of northern Saskatchewan. The Amazon River, the largest on Earth, takes ten years to discharge [20,000]cubic miles of water into the Atlantic Ocean, but the ice lake may have discharged it in a matter of days only. . . .

"Human beings retreating inland before the inflowing water may have reminisced and exaggerated afterward giving rise to talks of drowned continents and universal flood."<sup>1005</sup>

In this case, Isaac Asimov, who castigated Velikovsky for using mythic evidence, has stated,

"The entire corpus of humanity's myths and legends yields sentences on every side of every question and sometimes one of them must be hammered a bit to make it fit. . . . Velikovsky talks about [these myths]. . . .

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<sup>1005</sup>Isaac and Janet Asimov, *Frontiers II*, (New York, 1993), pp. 110-111.

"Gentle Reader, place all the myths and legends of the human race at my disposal; give me leave to choose those which I want to use and allow me to make changes where necessary; and I will undertake to prove anything you wish proven."<sup>1006</sup>

But in this case, when an establishment scientist uses ancient myths and legends to indicate there was an immense flood in the past, this idea is not vilified by Asimov. Asimov's statements sadly exhibit hypocrisy and duplicity.

Scott Fields further explains that

"... a series of catastrophic floods thousands of years ago may have produced the vast drumlin fields of southeastern Canada and the steplike patterns found in dead coral reefs off the Grand Cayman Islands. . . .

"Although drumlins are usually thought to be chiseled by glacial ice, these drumlins must have been formed by floods, Shaw says. *The reason: other ice-related forms, such as moraines, are missing in the area. . . .* (Emphasis added)

"As the oceans swelled, colonies of the coral *Acropora palmata* started to die, says geologist Paul Blanchon, also at the University of Alberta. Because this coral can grow only when it receives plenty of light, it 'drowns' in water deeper than 33 feet. . . . the reefs Blanchon studies drowned so quickly that they formed three distinct steps, one for each flooding peak.

"If the sea levels had risen slowly, Blanchon says, the reefs would have crept toward shallower water as corals built homes at depths they like best. Instead, entire colonies of *A. palmata* suddenly perished and were replaced by other species. Using previously established radioisotopic dates, Blanchon found that the events causing corals to drown coincide with the floods that produced Shaw's drumlins.

"Blanchon then estimated how quickly the sea would have to rise to overtake the coral's growth rate. 'We worked out that it would have to be at least a five meter . . . rise to drown them,' he says. But Shaw [believed] the extra rise was caused by huge pieces of ice that slid into the sea from eastern Canada and then melted."<sup>1007</sup>

However, drumlin fields are found all across North America and Europe, not just in eastern Canada and Saskatchewan, and this again suggests they were created by immense ice sheet slides accompanied by immense flooding. This evidence is in perfect agreement with the theory proposed by Velikovsky. Let us also remember that J. A.

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<sup>1006</sup>Isaac Asimov, *The Stars in Their Courses*, (New York, 1971), pp. 40-41.

<sup>1007</sup>Scott Fields, "Megafloods at Ice Ages End," *Earth: The Science of Our Planet*, (May 1994), pp. 12-13.

Steers pointed out that the submerged forests, found all over the Earth off the continents, could only have been buried suddenly, since gradual submergence would destroy all evidence of them.

Furthermore, if, as Velikovsky claimed, the ice caps of Greenland and Antarctica were built up suddenly and catastrophically during the retilting of the Earth's axis 3,500 years ago, then clear physical evidence should also exist that demonstrates this. The evidence should indicate a sudden change, and not a gradual one. There are a few fundamental pieces of evidence that lead just to that conclusion.

The first phenomenon is that of dust found in the ice caps of Greenland and Antarctica. What Velikovsky suggested is that dust in the Earth's atmosphere over the arctic regions cooled these areas so rapidly that the temperature there fell dramatically to freeze the mammoths. This is similar to the theory of Nuclear Winter proposed by Carl Sagan, *et al*, of Cornell University. Velikovsky maintains that all or nearly all the Earth's volcanos erupted spewing millions of tons of ash and smoke which blocked sunlight from reaching the surface. In addition, dust from the comet-planet Venus and its train of debris would have also been introduced into the atmosphere to block out sunlight.

The concept of a volcanic dust veil affecting the climate quite dramatically goes back to Benjamin Franklin, living in Paris as the United States diplomat who wrote in May 1784:

"During several of the summer months of 1783, when the effects of the sun's rays to heat the Earth in these northern regions should have been the greatest, there existed a constant fog over all Europe and a great part of North America. This fog was of a permanent nature; it was dry and the rays of the sun seemed to have little effect towards dissipating it. . . . They were indeed rendered so faint in passing through it that when collected in the focus of a burning [magnifying] glass, they would scarce kindle brown paper. Of course, their summer effect in heating the Earth was exceedingly diminished.

"Hence, the surface was early frozen.

"Hence, the first snows remained on it unmelted.

"Hence, perhaps, the winter of 1783-84 was more severe than any that had happened for many years.

"The cause of this universal fog is not yet ascertained . . . whether it was the vast quantity of smoke long continuing to issue during the summer from Helka [volcano], in Iceland, and from that other volcano which arose out of the sea near the island, which smoke might be spread by various winds over the northern part of the world. . . .

"It seems, however, worthy of inquiry whether other hard winters recorded in history, were preceded by similar permanent and widely extended summer fogs."<sup>1008</sup>

A brief description of the eruption of one volcano that occurred in the last century is presented by Sagan and Turco, which explains this phenomenon.

"Perhaps the best-known recent case is the volcanic explosion on the island of Tambora, in what is now Indonesia, in April 1815. This event, one of the most violent in historical times, was heard in New Guinea and in Sumatra 2,000 kilometers [1,325 miles] away. . . . Soon after, it was noon dark as a moonless night hundreds of kilometers away, in Java. Two weeks later temperatures were below freezing in Madras, India (late April 1815). *Months later snowfalls in Europe were described as 'brown or flesh-colored,' because of the volcanic ash in every snowflake.* After the fine stratospheric debris from the explosion had spread worldwide, incoming solar radiation at the Earth's surface fell by an average of some 10% and the average global temperature declined by about 1°C [1.8F]. The next year brought local temperatures that were the lowest in American meteorological history—but on average, only about 3°C (5F) below normal. The fluctuations were more severe. That summer of 1816 was afterwards known in the folklore of New England as 'eighteen-hundred-and-froze-to-death.' There was snow in June, frost in July and August."<sup>1009</sup>  
(Emphasis added)

The authors go on to describe what followed in the wake of the eruption. Numbers of dead birds fell from the sky in New York. The corn crop failed in New England. In North Carolina, the hay and corn crops were meager, as was the sugar crop of the British West Indies, and food had to be imported to the island of St. Kitts, in the Caribbean, to stop famine. Certain regions forbade the export of basic foods and the grain crops of Western Europe failed where 1816 was called "the year without summer."

All this is quite similar to the climate catastrophe described above that occurred in Akkad and all across the world in ancient times which led to great migrations of peoples and the collapse of many ancient civilizations. But the Tambora volcanic climatic change was not permanent.

The conditions around the world were horrendous and thousands of people starved or nearly starved to death. But of most significance, dust in the atmosphere will cool the climate especially in the high arctic and antarctic latitudes. Thus, according to Reid Bryson,

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<sup>1008</sup>Hubert H. Lamb, *Weather, Climate and Human Affairs*, (London, 1988), pp. 306-307.

<sup>1009</sup>Carl Sagan, Richard Turco, *A Path Where No Man Thought*, (New York, 1990), p. 99.

"Dust in the atmosphere tends to cool the high latitudes more than it does the tropical regions, no matter where it enters the atmosphere. Some dust is carried poleward, over a period of weeks or months, by the high altitude flow of air from the tropics. More important, even if dust were distributed evenly throughout the atmosphere, the poleward regions would be more shaded by it than the tropics. Sunlight takes a nearly vertical path through the atmosphere in the tropics, but away from them comes in at an angle and therefore has a longer path through the atmosphere. If the atmosphere is dusty, the sunlight has a longer path through the dust—and it diminishes all along the way."<sup>1010</sup>

Therefore, during an immense catastrophe, as that delineated by Velikovsky, the arctic and Antarctic regions would be greatly shaded and hence would be tremendously cold and this cold would come suddenly and catastrophically.

In 1978, Sir Fred Hoyle also offered that the onset of an Ice Age can be catastrophic and induced by a global dust veil in the atmosphere. In his 1981 book, *Ice*, he presents just this analysis, as summed up by John Gribbin, who informs us that Hoyle

"... prefers the idea that the impact of giant meteorites with the Earth can cause both the sudden onset of full Ice Age conditions and the sudden arrival of interglacial conditions.

"... Very simply, ... he argues that the impact of a large stone meteorite on the Earth can cause a cooling by spreading dust through the atmosphere, like a mighty volcanic eruption, and blocking out the heat from the Sun. He correctly points out that the oceans of the world store great quantities of heat energy, and reasons that an Ice Age will only begin if the dust layer persists long enough for this heat to be dissipated as the Earth cools below. At a critical temperature, the atmosphere itself would become so cold that tiny water droplets suspended in the stratosphere would be frozen into ice particles, highly reflective 'diamond dust,' and this would then take over the task of reflecting away the solar heat after the meteoritic dust settled."<sup>1011</sup>

But what none of the advocates of this process ever mention is that this concept of a sudden Ice Age onset was originally proposed by Ignatius Donnelly, from whom Velikovsky presented this very scenario, so far as I know, before Hoyle, Sagan, and Velikovsky. For example, Carl Sagan, who has been a very vocal critic of Velikovsky, claims Hoyle and Wickramasinghe "clearly anticipate" the concept of nuclear winter. On this matter, Sagan and Turco remark,

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<sup>1010</sup>Reid Bryson, T. Murray, *Climate of Hunger*, (Madison, Wis., 1977), p. 148.

<sup>1011</sup>John Gribbin, *Future Weather*, (New York, 1982), p. 109.

" . . . *It is the first mention in the scientific literature*, so far as we know, of the anti-greenhouse effect. . . . They proposed that such a near collision could—through falling temperatures and diminished sunlight for photosynthesis—have produced mass extinctions even if the particles took no more than a year to fall out of the atmosphere."<sup>1012</sup> (Emphasis added)

Victor Clube and Bill Napier, in several books and papers, present the same concept. For example, in their book, *The Cosmic Winter*, they write,

" . . . it seems that a significant cosmic [cometary] encounter, [is] enough to reduce sunlight to a few per cent of its normal value, would precipitate a rapid plunge to subfreezing temperatures (say -30°C or colder) in continental regions. . . . With the extreme cold would come storms of unprecedented intensity, especially near continental edges. It would be difficult to see even by day, and photosynthesis would come to a halt. The dust . . . even if initially confined to one hemisphere, would within a few months, spread to the other, and so the effects would be global."<sup>1013</sup>

While Sagan claims Hoyle and Wickramasinghe were the first to offer the concept of an Ice Age starting from the encounter with a comet causing dust in the atmosphere, they never mention the fact or give credit to Donnelly, who first introduced this scenario. Velikovsky, in his 1955 book, *Earth in Upheaval*, also employed Donnelly's theory, but at least credited his work.

"Water evaporated from the oceans would rise in clouds and fall again in torrential rains and snowfalls. Clouds of dust, ejected by numerous volcanos and swept by hurricanes from the ground, and possibly dust clouds of extraneous origin—if a cometary train of meteorites was the foreign body causing the upheaval—all this dust would keep the rays of the sun from penetrating to the earth. The temperature under the clouds would be reduced, but close to the ground it would be higher than normal because the heated earth would, by convection, dissipate its heat into the atmosphere. . . . In higher and in temperate latitudes, the falling snow would turn to water or even vapor before reaching the ground or soon thereafter. For many months and probably years, the snow falling on the ground would melt. . . .

"Falling again and again in a sunless world, the snow, shielded from the sun's rays by thick clouds enveloping the earth, would finally cool the ground where it would turn, not into water, but into ice. At first, this ice would lie firmly on the ground; from inclines and slopes it would slide down to the deep valleys

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<sup>1012</sup>Carl Sagan, Richard Turco, *A Path Where No Man Thought*, (New York, 1990), p. 66.

<sup>1013</sup>Victor Clube, Bill Napier, *The Cosmic Winter* (Cambridge, Eng., 1990), p. 267.

and then toward the sea. Large icebergs would fill the sea and, tossing about, melt and drop a load of stones or other detrital material to the bottom; other icebergs, floating over valleys filled with water, would deposit their loads there. In the course of years, the incessant action of the snow would cool the ground in the higher latitudes to such an extent that a permanent cover would be built."<sup>1014</sup>

Here, finally, is Donnelly's description of an Ice Age brought on by a comet's interaction with the Earth. He claims the Earth's oceans, because they were warmed by this interaction, placed an immense amount of water vapor in the atmosphere and then

"Condensation commences. Never has the air held such incalculable masses of moisture, . . . Condensation means clouds . . . The veil thickens. The sun's rays are shut out. It grows colder, [hence] more condensation follows. The heavens darken. . . . The heat has carried up perhaps one fourth of all the water of the world into the air. Now it is condensed into clouds. We know how an ordinary storm darkens the heavens. In this case, it is dark night. A pall of dense cloud, many miles in thickness, enfolds the earth. No sun, no moon, no stars, can be seen. . . . The overloaded atmosphere begins to discharge itself. The great work of restoring the waters of the ocean begins. It grows colder-colder-colder. The pouring rain turns into snow and settles on all the uplands and north countries; snow falls on snow; gigantic snow-beds are formed, which gradually solidify into ice. While no mile-thick ice sheet descends to the Mediterranean or the Gulf of Mexico, glaciers intrude into all the valleys, . . . the temperate regions become arctic; that is to say, only those varieties of plants and animals survive in those regions that are able to stand the cold. . . ." <sup>1015</sup>

On the basis of Velikovsky's theory, the continental ice sheets covering Greenland and Antarctica were created quite recently. Ice experts suggest these great sheets are much older; Greenland's perhaps 120,000 years. How did they arrive at this? There are two methods: one is counting ice layers and the other modeling ice flow. On the basis of their ice flow model, it was concluded that ice from the center of Greenland would take some 20,000 years to reach the coast.<sup>1016</sup> Since ice is calving off into the ocean at a rate of 100 feet (30 meters) a day, or as slow in some places as 9 feet (3 meters), the analysis was made to support the conclusion that the ice cap of Greenland was 120,000 years old. However, if the ice moved away from the center of the island faster and reached the coast in a shorter time, then the cap would have to be younger. And that was just what was discovered. According to Emberton and King, the ice made the trip from central

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<sup>1014</sup>Immanuel Velikovsky, *Earth in Upheaval*, *op. cit.*, pp. 137-138.

<sup>1015</sup>Ignatius Donnelly, *Ragnarok*, (1883) (reprint 1970, New York), pp. 109-110.

<sup>1016</sup>C. Emberton, C. M. King, *Glacial Geomorphology*, 2ed., (London 1975), p. 16.

Greenland to the coast in only 3,100 years.<sup>1017</sup> The uniformitarians' ice cap model requires a 20,000 year transit time, and the measurements indicate a 3,100 year transit time, requiring that the Greenland ice cap must be far younger than 120,000 years. The only way to salvage the model is to reconfigure every aspect of it from top to bottom.

I have spent this inordinate amount of time on these catastrophic descriptions because the evidence for them as a reality does exist. Velikovsky has added to Donnelly's thesis the addition of volcanic and Venusian dust to veil the Sun. Sagan and Clube, and Napier, and Hoyle, have all failed to give credit to the earlier work of Donnelly. Brooks describes the end of the hipsithermal thus:

"Then came an unusually quite, cold winter, the ice-cap obtained a footing and, perhaps in the course of a single season, covered the greater part of the Arctic Ocean. The result was a sudden, great change in the climate of Europe; the conditions of to-day came in 'with the appearance of a catastrophe.' The ice-cap, once formed, kept the winter temperature below the critical point by its own power of persistence."<sup>1018</sup>

Kenneth J. Hsü claims, "The effect from an early snowfall lingers only through that winter, but the heat loss from a very large snow-covered area of the globe, melting only slowly in the cooled climate, could linger for several hundred years. . . ."<sup>1019</sup> This, as we will shortly see, is extremely important for cooling the Arctic Ocean to the point at which it will freeze after the hipsithermal warmth made it extremely difficult to refreeze by addition of only a small temperature change. One researcher claims: "The onset of the ice age was rapid perhaps occurring over a century or two or even within a few decades."<sup>1020</sup> Of course, he is thinking in terms of the accepted chronology for the Ice Age; but in fact he is willing to submit the idea that "a few decades" of cold will allow for the conditions of an Ice Age."

In agreement with this evidence, Lamb has also suggested:

". . . that the memory of these icy centuries may have formed the basis of the Norse legend of the end of the world—Ragnarok, the twilight of the gods. The Ragnarok story tells of the coming of the Fimbulvinter, a run of three severe winters in succession with no summer in between, associated with a great fire. Lamb has

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<sup>1017</sup>*Ibid.*, p. 49.

<sup>1018</sup>Brooks, *Climate Through the Ages*, *op. cit.*, p. 143.

<sup>1019</sup>Kenneth J. Hsü, *The Great Dying*, (New York, 1986), p. 252.

<sup>1020</sup>Flannery, *The Future Eaters*, *op. cit.*, p. 182.

suggested that the great fire, like the severe weather that occurred when forests that were killed and dried out during the long winter burned."<sup>1021</sup>

However, one of the most significant pieces of information regarding the sudden buildup of the ice caps at the end of the hipsithermal was presented by John and Mary Gribbin which deals with freezing the Arctic Ocean once it has lost all its ice say, during the hipsithermal.

"Although these [Milankovitch] cycles are very good at producing ripples and warming and cooling within the Ice Epoch, they cannot on their own explain exactly how the world got into its present state, and in particular they cannot explain what caused the Arctic Ocean to freeze.

"The point is that the Arctic Ocean today—given the present arrangement of the continents and pattern of solar heating—could quite happily exist either with an ice cap as it has now, or without [one]. . . . If the Arctic region warmed by a few degrees Celsius, the ice cover would melt, exposing the dark ocean water below. Because the dark water absorbs heat that ice reflects away, it would then get warmer still, . . . Because dark ocean water is so good at absorbing solar heat, the surface of the sea would stay warm enough to prevent ice from forming. You would have to cool the globe by several degrees more before ice suddenly began to spread across the Arctic Ocean again."<sup>1022</sup>

The reason for this is that, "It's harder to change the temperature of the oceans than of continents, which is why ocean temperatures are much more steadfast over the diurnal and seasonal cycles"<sup>1023</sup> An immense body of water will take an extremely long time to cool and then freeze.

However, earlier evidence presented above proves that the Arctic Ocean, all during the hipsithermal, was ice free. Under this circumstance the necessary requirement for ice to form is extremely severe cooling and not just the few degrees that occurred at the end of this period of greater warmth. What is needed is a sudden broad ice cover over a major portion of the Arctic Ocean. A small ice covered area will not cool the environment enough to permit ice to continue to form because the warm ocean waters surrounding this limited region will produce sufficient heat to overwhelm the limited cooling. Every summer, twenty-four hours of sunlight would be absorbed by the Arctic Ocean and it would be reheated because it had no ice. The heat from the Gulf Stream would enhance this effect throughout the rest of the year. What *is* necessary is extreme cold over most of the Arctic Ocean for a relatively long time—a few years—to greatly

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<sup>1021</sup>John and Mary Gribbin, *Fire On Earth*, (New York, 1996), pp. 199-200.

<sup>1022</sup>John and Mary Gribbin, *Fire on Earth*, (New York, 1966), p. 149-150.

<sup>1023</sup>Carl Sagan, Richard Turco, *A Path Where No Man Thought*, *op. cit.*, p. 22.

chill the warm water and cause it to freeze and form ice over a very broad region that will survive through the summer. This cannot occur with a small temperature drop which occurred gradually. Lamb came to the same conclusion, namely, ". . . in the extreme case of the pole lying in the middle of a great ocean, it may reasonably be assumed that ice and snow could not accumulate."<sup>1024</sup> What this means is that ocean water temperature is well above freezing, hence any air masses over an ocean will be heated by it to above freezing temperatures. Therefore, snow-falls would be rare compared to snow over cold land masses. Any snow that did fall would alight on warm ocean water which would melt it. In order for snow to build upon ice on an ocean, that body of water must be at or very near to the freezing point. But since dark oceanic water is a great light and heat absorber, it will not become cold enough for ice to form. Whatever caused the Arctic Ocean to become cold, it was not a gradual change of a few degrees of air temperature. It had to be sudden and of extremely low temperatures to do just this, as it did to freeze the mammoths.

What is also extremely interesting, Lamb suggests a similar occurrence was necessary to establish the Antarctic ice sheet.

"Rocks of Eocene, Oligocene and in some places, Miocene age, however, contain fossil leaves and wood fragments, as well as pollen, indicating a rich flora with deciduous and coniferous trees in both the Antarctic peninsula . . . and Ross Sea regions. This biological evidence and the available evidence of world sea level suggests that no ice sheet of continental extent was present in Antarctica earlier than 40 million years ago and possibly not until long after that. Hence, the position of Antarctica over the South Pole—though doubtless a necessary condition—[to form a continental size ice cap] was not sufficient to cause extensive glaciation until some tens of millions of years had passed. The additional factors that were needed may have included the migration of the South Pole to near the centre of the continent, the entry of the North Pole into the nearly land-ringed Arctic Ocean, uplift of the Transarctic Mountains, and A WAVE OF VOLCANIC ACTIVITY CREATING GREAT DUST VEILS IN THE ATMOSPHERE, OR SOME EXTRATERRESTRIAL EVENT SUCH AS A LONG-TERM 'FLICKE' OF THE SUN [intrusion of great masses of dust from a passing cometary body].<sup>1025</sup> (Capitalization added)

The reason for this is essentially the problem discussed above about getting sufficient water vapor to the highest latitudes when the climate is cold. Cold air carries much less moisture than warm air and to carry sufficient water vapor into the heart of Antarctica to create an ice sheet is a self-defeating concept in an ice age climate. The reason for this is that cold air is more dense than warm air. This creates high atmospheric pressure where the cold air forms and this region of cold air at high pressure pushes

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<sup>1024</sup>Hubert H. Lamb, *Earth, Climate and Human Affairs*, (London, 1988), p. 221.

<sup>1025</sup>*Ibid.*, pp. 308-309.

outward into regions of warm air at lower pressure. Therefore, once the Antarctic becomes extremely cold, warm, moist air will have a very difficult time to move against this pressure gradient. The cold air in Antarctica will push northward and inhibit any of the moist warm air at low pressure from moving southward. But even if warm moisture laden air somehow does begin to blanket the hinterlands of Antarctica and produces snow, this new whiter snow layer will reflect sunlight more strongly and thus make the air temperature colder, more dense and with an even higher pressure which pushes warm moist air away from this continent even more vigorously. All this Oard pointed out above. Lamb, who well understood this feedback mechanism, in essence knew this process would defeat a gradual buildup of ice over Antarctica. He, therefore, called upon immense amounts of dust in the atmosphere to allow the warm oceans to put immense water vapor into the atmosphere which would fall as immense blizzards in all cold regions.

In essence, all the elements coincide as they are related to a sudden catastrophic climate change around 1,500 B.C. In fact, Velikovsky goes on to show that of the giant Sequoia trees, "the most ancient started life after the year 1,300 before the present era."<sup>1026</sup> Only a handful of bristlecone pine trees in a few regions of North America, managed to survive through this catastrophe, which should not be surprising, since during a catastrophe, some individuals do survive here and there. Unfortunately, bristlecone pine trees during years of stress do not produce tree rings to indicate that stresses occurred.<sup>1027</sup>

The point that must be emphasized is that the varve record categorically shows that the climate changed catastrophically not only in Scandinavia, but as described earlier all across the Earth leading to the collapse of several ancient civilizations. The only objection to this evidence is that the tree ring chronologies built up over the past several decades do not show narrow rings, indicative of cold weather in Irish bogs and elsewhere and on the continent of Europe for this precise time, but somewhat earlier. It has always been assumed that tree ring climate dating is superbly accurate. However, this is now in question because there is another method of dating past weather similar to that of tree rings, and by chemical analysis can give climatic conditions of the past. Since the more recent centuries are the ones best documented for tree rings and climate, these centuries should be the ones best corroborated by coral growth bands. Both are based on comparison of carbon-14 to carbon-12 ratios. Nevertheless, pre-1950 to the 1700's coral growth bands from Bermuda and the Florida Keys are in stark contradiction to those of tree rings for the same period.<sup>1028</sup> That is, we now have another climate chronology that contradicts that of dendrochronology! Therefore, the period assigned to frost rings of Irish bog oaks and European trees as well as to bristlecone pines may be off by a few

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<sup>1026</sup>I. Velikovsky, *Earth in Upheaval*, *op. cit.*, p. 175.

<sup>1027</sup>E. Schulman, *National Geographic Magazine*, (March 1958), pp. 356, 368.

<sup>1028</sup>"Carbon-14 Variations in Corals," *Open Earth*, No. 3, (1979), p. 30.

hundred years. In view of this evidence, this is not an unreasonable probability. Thus, the narrow ring timeline would then be in agreement with Velikovsky's chronology.

The varve record undeniably shows that there was a climate catastrophe in Scandinavia dated to historical times in the Bronze Age. Varve records from ancient lake beds from the Sahara to Iran, to India, to China, to America also show sudden climate change which Harvey Weiss also claims was catastrophic, meaning sudden. It would appear all these sudden climate changes do come close enough together to indicate that they all reflect the same global event.

However, to those uniformitarians who believe that dendrochronology is correct, I would ask them to explain how the 16,000 year old wood found at Meadowcroft rock shelter in Pennsylvania could reflect trees that did not grow there during the Ice Age. And how do they explain the tall trees in the tundra found with mammoths dated to the Ice Age when the palynologists proved no trees grew there at that time?

After all, dendrochronology essentially confirms its findings by utilization of radiocarbon. As has been shown above, radiocarbon dating is fraught with problems and outright manipulations that indicate it is not as reliable as assumed. Not to admit this possibility of error in tree ring dating based on radiocarbon confirmation is simply unscientific. As was pointed out by T. Pecora and Meyer Rubin of the U. S. Geological Survey in discussing dating methods, "the possibility that all methods used today [including dendrochronology] are wrong must be acknowledged."<sup>1029</sup> That is, all the evidence related to carbon-14 dating, and its abuse outlined above, are applicable to tree ring dating, as well. To deny this is to deny the possibility of some error.

Nevertheless, tree rings of the bristlecone pines in the American Southwest, Irish oaks from bogs and other areas, indicate a sudden and, therefore, catastrophic climate change quite close in time to that proposed by Velikovsky. According to B. Bower, dated wood from a Juniper log in Turkey which "contained a slight margin of error [gave]

"... confirmation with the observation of another Turkish site of exceptional growth in tree rings that correspond to comparably enlarged European and North American tree rings dated at 1628 B.C. . . .

"Some kind of environmental disturbance produced dramatically cooler, wetter climate throughout much of the world, resulting in these alterations in tree growth. . . ."<sup>1030</sup>

Of course, the date does not precisely match Velikovsky's. A variation by about a hundred years in such a long chronology as this, I contend, is to be expected, in spite of the claim that such tree ring chronologies are precise markers of time.

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<sup>1029</sup>Gwen Schultz, *Ice Age Lost*, *op. cit.*, p. 29.

<sup>1030</sup>B. Bower, "Ancient World Gets Precise Chronology," *Science News*, (June 29, 1996), pp. 405-406. (Credit for this goes to C. J. Ransom).

Nevertheless, if Velikovsky's scenario is correct the ice cores taken from Greenland and Antarctica will reflect this especially in the amount and types of dust found in these ice sheets. There is a crucial difference between Velikovsky's catastrophic model for the buildup of the ice caps and that of the uniformitarians. Velikovsky's theory requires that the snow that fell over Greenland and Antarctica was loaded with dust; as Sagan and Turco claimed, "snowfalls in Europe were described as 'brown or flesh-colored,' because of volcanic ash." However, the uniformitarians have proved that the Ice Age was a pluvial period, a period of great rainfall. According to Robert Silverberg,

"During the glacial epochs, such regions as Africa, South America, central Asia, and the southern United States experienced 'pluvial' periods of greatly increased rainfall. A series of pluvial and interpluvial periods, almost exactly corresponding to the glacials and interglacials of colder latitudes, has been determined. During these prolonged rainy spells lakes and rivers grew, basins now dry filled with water and deserts bloomed. Nevada contained more water than Minnesota does today; a vanished pluvial lake we call Lake Lahontan, covered the northwestern part of the state. California's Death Valley had a pluvial lake more than a hundred miles long. The biggest of the American pluvial lakes was Bonneville, of which only the shrunken remnant we call Great Salt Lake, remains. In the wettest periods, Lake Bonneville was nearly a thousand feet deep—Great Salt Lake is 30 feet deep at most—and reached into Nevada and Idaho. There were lakes in the Sahara; rainfall was heavy in Africa's Kalahari Desert and Asia's Gobi."<sup>1031</sup>

Rainfall is well-known to cleanse the atmosphere of dust and, therefore, based on this evidence, the snow that fell to form the Ice Age ice caps would have very little dust of any kind in it.

Conversely, the period after the Ice Age was drier and much dustier. Charlesworth explained that the hipsithermal exhibits "much evidence not only of a warmer but of a drier 'xeric' or 'xerothermic period'."<sup>1032</sup>

Pielou adds this remarkable comment, that after the Ice Age:

"Where newly ice-free land was suddenly exposed to warmth and dryness, conditions were probably harsh, though not in the sense of being cold. The proximity of warm land to cold ice produced a steep temperature gradient and, consequently, strong winds. Continual gales must have swept across the country before vegetation had developed to act as a brake. As long as there were no plants to diminish its force at ground level, the wind picked up quantities of

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<sup>1031</sup>Robert Silverberg, *Clocks for the Ages*, (New York, 1971), pp. 94-95.

<sup>1032</sup>Charlesworth, *The Quaternary Era*, *op. cit.*, p. 1490.

loose dust, sand and grit from the quickly drying till, producing dust storms that darkened the sky for weeks at a time."<sup>1033</sup>

Thus, as the ice gradually retreated, according to the uniformitarian scenario, bare ground would have constantly been exposed and dust storms raged throughout much of this period. All the ice formed during this time would be a great deal dustier than that which formed during the Ice Age. Hence, if the uniformitarian analysis of gradual ice cap formation is correct, the ice formed during the Ice Age would contain very little dust. On the other hand, if Velikovsky's catastrophic analysis of ice cap formation is correct, the deeper ice where Velikovsky's dust evidence should begin—working downward—must show exorbitant amounts of a whole variety of sources of dust. This is the crucial difference and key to determining this dust evidence. Velikovsky's catastrophic theory is diametrically opposed to that of the uniformitarian theory. While the uniformitarian analysis demands little dust in the deep Ice Age layers and more dust in the post Ice Age ice, Velikovsky's concept requires tremendous amounts of dust in the deeper layers, and very little dust, by comparison, in the ice above this material. What, then, does the evidence show?

Hammer, *et al.*, state that the dust particles in the ice of the Greenland glacier were "up to 100 times as great in the last Ice Age as at present,"<sup>1034</sup> and with respect to Antarctica compared to Greenland, the dust was "an order of magnitude higher."<sup>1035</sup> That is, the dust in Greenland was up to 100 times the amounts found in post-Ice-Age ice, while for Antarctica, it was up to 1,000 times greater. If Velikovsky is correct, as this evidence clearly confirms, then the boundary between the dusty ice and that above it should be clear and distinct while, according to the uniformitarian theory, the change in the dust layers should be gradual. In this respect, Willi Dansgaard, *et al.*, report that the boundary between the Ice Age and the Holocene coincides with a sharp decline in the concentration of dust in glacial ice!<sup>1036</sup>

Furthermore, if Velikovsky is correct, the amount of cosmic dust in these layers in places will be found in inordinate amounts. According to Paul A. La Violette, the amount of cosmic dust in 20,000 year deep Greenland ice of "submicron sized particles must have increased by a factor of  $10^5$  [100,000 times] or more. . . ."<sup>1037</sup>

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<sup>1033</sup>Pielou, *After the Ice Age, op. cit.*, p. 271.

<sup>1034</sup>Hammer, *et al.*, "Continuous Impurity Analysis Along the Dye 3 Deep Core," *American Geophysical Union Monograph*, 33 (1985); 90.

<sup>1035</sup>*Ibid.*

<sup>1036</sup>Dansgaard, *et al.*, "The Abrupt Termination of the Younger Dryas Climate Event," *Nature*, Vol. 339, (1989), p. 532.

<sup>1037</sup>Paul A. La Violette, "Evidence of High Cosmic Dust Concentration in Late Pleistocene Polar Ice (20,000-14,000 years B.P.)," *Meteoritics*, Vol. 20, (1985), p. 545.

According to Clube and Napier, the amount of dust found in this deeper ice was so great they claimed

" . . . so much dust was laid down . . . that if indeed it entered through the high stratosphere, the sky would have been densely veiled, polar sunlight being reduced to a fraction of its present-day level."<sup>1038</sup>

This is just what Velikovsky's theory requires and what the evidence suggests. They then add that "samples of ice from Camp Century ice core . . . [contain] high iridium levels . . . in all samples examined."<sup>1039</sup> The "deposition rates [were] 10 to 60 times greater than those of the present day."<sup>1040</sup>

Iridium is a rare element in the Earth and somewhat less rare in meteorites. Therefore, it is important that the source of this material be analyzed. Now, where would 10 to 60 times the amount of iridium normally expected to be found in the ice come from? La Violette ruled out a terrestrial source via volcanism because volcanism will not produce this large amount of iridium over a 6,000 year stretch of time. He also dismissed the view that the iridium could have been derived from asteroids, and cometary tails. Dust from such sources could only remain in the atmosphere for a year, but not for 6,000 years, as the evidence from the ice cores indicates. In essence, the scientific community has an enigma on its hands. In terms of gradualism, iridium was falling on the Greenland ice cap regularly for about 6,000 years and settled in ice layers which contain 10 to 60 times the present influx of this material. The view of Velikovsky that the ice cap built up suddenly in a dust-filled environment mixed with cosmic dust is in complete agreement with this finding. The uniformitarian interpretation of this much iridium, even falling intermittently in such large amounts over so long a period, is simply implausible.

Iridium could not remain in the atmosphere over so long a time. Yet that is what La Violette found, "high iridium levels . . . in all samples examined."

Furthermore, C. Koeberl also found high iridium levels in dust bands in Antarctic ice cores. The extraordinary aspect of these findings was surprising in that there were four to eight parts per billion of iridium which is similar to that found at some K/T boundary sections.<sup>1041</sup> On the other hand, eruptions of ash from volcanos in Kamchatka

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<sup>1038</sup>Victor Clube, Bill Napier, *The Cosmic Winter*, *op. cit.*, p. 268.

<sup>1039</sup>*Ibid.*, p. 269.

<sup>1040</sup>*Ibid.*, p. 270.

<sup>1041</sup>C. Koeberl, "Iridium enrichment in volcanic dust from blue icefields, Antarctica, and possible relevance to the K/T boundary event," *Earth & Planetary Science Letters*, Vol. 92, (1989), pp. 317-322.

contain iridium at levels between one to four parts per billion.<sup>1042</sup> Thus, there are extremely high amounts of iridium in both the Greenland and Antarctic ice caps. If there never was a sudden global catastrophe and sudden buildup of the ice caps, why is this material there? Iridium from comets is highly questionable, as are other metals. Clube and Napier go on to show that

"La Violette found also that the dust had a very unusual chemical composition; and at particular levels in the ice, the overabundance of several elements jumped by large amounts. At one level the concentration of tin jumped by over 27,000 times and silver by over 200 times. It is very unlikely that this is ordinary meteoritic material since there appeared to be particles hundreds of times richer in tin, antimony, silver, and gold than ordinary meteorites. It is very unlikely, too, that this material came from Earth: for example, the tin is over 100,000 times more concentrated than the ordinary material of the Earth's crust. La Violette pointed out that 'If this material is of extraterrestrial origin, its source must be different from that of the majority of meteoritic material'."<sup>1043</sup>

Why would this dust be so different from ordinary meteorites or Earth based mineral sources if this material came from asteroids, meteorites, comets, the Earth, etc.? The measurements are not in any way indicative of these origins. But, of course, this material could well have come from a giant, super-hot planet such as Venus, as Velikovsky suggests, as it neared the Earth with its immense tail laden with plasma, gases, and particles. At such extraordinarily high temperatures that Venus experienced, as would be expected from a body derived from the silicate-iron core of Jupiter, hotter than nine times the surface of the sun, its atmosphere and molten-gaseous core would expand tremendously to permit it to form an immense tail of gas, plasma, and particulate matter.

Furthermore, if, as Velikovsky claims, much of the large particulate matter came from volcanic activity on Venus and Earth, the deeper ice, which contains 100 to 1,000 times more of this material, should also contain these large particles. According to Lamb, "The large particles [in the ice cores] must be overwhelmingly attributable to volcanic eruption products in the atmosphere owing to other extensive sources of dust."<sup>1044</sup>

Although extremely small particles can be lifted high into the atmosphere and then transported to the poles, larger particles cannot unless a powerful, extraordinary mechanism places them high above the Earth. There are a few mechanisms that could accomplish this. Volcanism, of course, as stated by Lamb, can do this; hurricanes of

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<sup>1042</sup>S. B. Felitsyn, P. A. Vaganov, "Iridium in the ash of Kamchatkan volcanoes," *International Geology Review*, Vol. 30, (1988), pp. 1288-1291.

<sup>1043</sup>Clube, Napier, *Cosmic Winter*, *loc. cit.*

<sup>1044</sup>Lamb, *Weather Climate and Human Affairs*, *op. cit.*, p. 320.

immense force may also accomplish this, and sources from space can produce much of this material.

It must be remembered that Venus, as delineated by Velikovsky, was a planet on a cometary orbit; it never was an ordinary comet. Therefore, most of the materials it left in the Earth's atmosphere would be of a planetary nature, and it would be difficult for large particles to fall on the ice caps in large numbers rather than the fewer expected from Earthly sources. The evidence of this dust, and that of cosmic dust in the deep ice, is in complete rapport with Velikovsky's model.

I have previously shown that the ice cores lacked validity in terms of climate data.<sup>1045</sup> For those interested in a thorough debunking of the climate interpretations of the ice cores, I cannot recommend too highly the work of Zbigniew Jaworowski. In a paper in *21st Century* for Spring 1997, pages 42-52, he completely discredits the validity of the ice cores as reliable measurements of anything. He states (page 42) that the forms of evidence derived from "glacial ice samples, are based on fudged data and ignorance of the physical processes of glacial ice formation." With respect to dendrochronology dating and that of the Greenland ice cores, he states (page 43) "Dating of such important climatic events as the termination of the Younger Dryas period based on dendrochronology . . . and lake sediments, differs from recent ice-core data from Greenland by up to about 900 years." (See G. Landmann, *et al.*, *Paleogeogr. Paleoclimat. Paleoecol.* Vol. 122 (1996), p. 107.) On Page 45 he shows that U.S. warplanes in Greenland that had been buried in 1942 and were expected to have been buried not very deeply beneath the ice, based on the concept of ice layers, were recovered 47 years later actually buried "at a depth of 78 m[eters], and not the 12 m[eters] that had been estimated using oxygen isotope dating." (G. Heinsohn, 1994, *Vorzeit-Fruhzeit-Gegenwart*, Vol. 4, p. 76). In dealing with the validity of the ice cores, Jaworowski, a multidisciplinary scientist, and a professor at the Central Laboratory for Radiological Protection, Warsaw, Poland, who has served as the Chairman of the United Nations Scientific Committee on Effects of Atomic Radiation, and who has studied glacial ice samples from around the world, states that the evidence derived from ice core data is "Fraud" (page 42).

If the ice cores taken from Greenland were truly accurate, they would agree with one another, especially those drilled fairly close and parallel to each other. Nevertheless, Mike G. L. Baillie admits this is not always the case.

"The failure of Hammer, *et al.*, to duplicate either the  $1390 \pm 50$  B.C. event or the  $1645 \pm 20$  B.C. [signal] event in parallel [ice] cores radically dents the credibility. . . ."<sup>1046</sup>

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<sup>1045</sup>Charles Ginenthal, "Ice Core Evidence," *The Velikovskian*, Vol. 2, No. 4, (1994), pp. 53-90 *ff.*

<sup>1046</sup>Mike G. L. Baillie, "Dendrochronology and Thera: The Scientific Case," *Journal of the Ancient Chronology Forum*, Vol. 4, (1990-1991), p. 24.

In essence, the cores in one instance exhibit evidence of volcanic eruptions but are lacking in the parallel core. The contradictions are simply too great to suggest that the evidence from them flows from gradual build-up of the ice. But let us return to the other materials found in the ice caps.

As Oard pointed out earlier, the source of moisture to generate continental ice caps is lacking in practically all theories of Ice Ages. That is, the colder the air temperature, the less effective is the process of evaporation of water vapor. Not only can little warm, moisture-laden air penetrate against the pressure gradient into the hinterlands of Antarctica or the frozen arctic, but if the air surrounding these areas is extremely cold, little evaporation will occur to create the moisture necessary for an Ice Age. C. Leroy Ellenberger, unaware of this process, has attacked Velikovsky for suggesting that not only does one need cold temperatures over the arctic and Antarctica, but immense amounts of water are also needed to evaporate from a water source to supply the snow that falls to start an Ice Age. He states that

"... specious reasoning in Velikovsky's presentation needs to be clarified. This involves his reliance upon Tyndall's 19th century discussion of the heat required to make glaciers (*Earth in Upheaval*, pp. 131-134) which Velikovsky used to support the idea that high temperatures were needed to evaporate the oceans to form snow. By comparing a pound of ice with five pounds [actually it should be 3.4 pounds] of cast iron at the melting point to illustrate the large amount of heat required to evaporate water, Tyndall confounded heat with temperature.

"According to Velikovsky: 'Tyndall argued that the geologists should substitute the hot iron for the cold ice, and they would get an idea of the high temperature immediately preceding the Ice Age and the formation of the glacial cover' (p. 131). However, this is incorrect because the ice accumulating today in Greenland and elsewhere does not originate from water that has literally boiled. It is not to Velikovsky's ... credit that he perpetuated Tyndall's fallacious reasoning. Both Tyndall and Velikovsky failed to understand the fact that water's large, latent heat of vaporization can be extracted at room temperature as well as at the boiling point. The melting point of cast iron is irrelevant to the formation of clouds over oceans."<sup>1047</sup>

What Ellenberger has failed to understand is not that the question regarding latent heat of vaporization is important, but that great heat over long periods of time is important for the formation of sufficient water vapor *via* evaporation to form continental ice caps. What Tyndall and Velikovsky were suggesting was that for clouds to derive sufficient water vapor at the beginning of an Ice Age, heat must be added to water for it to evaporate. The point is not irrelevant. At the onset of an Ice Age, the air temperature becomes cold, particularly around the poles. This cold air "supposedly" allows snow to

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<sup>1047</sup>C. Leroy Ellenberger, Still Facing Many Problems (Part II)," *KRONOS*, Vol. X, No. 3, (Summer 1985), pp. 3-4.

build up and the snow reflects sunlight creating even colder polar regions. But cooling also leads ineluctably to the freezing over of the polar oceans all year round, and also the extension of the frozen sea ice much farther from the poles than it is today. Thus, not only was the source of water vapor pushed much farther from the poles, but the air surrounding the polar sea ice was also much colder, as well. There cannot be very much water vapor extracted from these ocean regions adjacent to the sea ice and then be transported against the pressure gradient to fall as snow. In fact, under these conditions, there is even less water vapor with which to form continental sized ice caps than exists today, as Oard clearly demonstrated. What Velikovsky and Tyndall understood was that great heat had to be applied to the ocean, and that amount of heat was necessary to evaporate sufficient water vapor (for an Ice Age) from a large body of water was not insignificant. That is, much of the entire body of water must be heated. But if the air temperature above the ocean is generally below freezing, created by air coming off the ice pack, then there is practically no significant evaporation. That is one of the reasons great heat must be added to the oceans to form polar glaciers. Ordinary heat would not be sufficient to form an ice cap or start an Ice Age, as pointed out by Donnelly.

"What caused the [great] ice [cap to form]? Great rains and snows, they say, falling on the face of the land. Granted. What is rain in the first instance? Vapor clouds. Whence are the clouds derived? From the waters of the earth, principally from the oceans. How is the water in the clouds transferred to the clouds from the sea? By evaporation. What is necessary to evaporation? *Heat*.

"If there is no heat, there is no evaporation [on a great scale]; no rain [on a great scale] no rain no ice [on a great scale].

"But as the Glacial age meant ice on a stupendous scale, then it must have been preceded by heat on a stupendous scale."<sup>1048</sup>

The second mistake Ellenberger made has to do with atmospheric circulation. As was pointed out above, the arctic basin and the Antarctic continent are polar deserts. Air masses originating in the temperate zone must carry water vapor to the poles via Hadley cells. But almost all of this moisture falls out of the atmosphere before it reaches the polar regions and the descending air masses are cold and dry and remove what little atmospheric moisture exists in these icy climes. In order to get these Hadley cells to transport sufficient amounts of water vapor to the frigid zones, the ocean must be heated significantly. This is just the opposite of what is believed occurred during the Ice Age. But to heat the ocean enough and then to transport lots of water vapor to the poles demands heat. This is what Tyndall and Velikovsky were addressing. They were suggesting that, for the onset of an Ice Age, immense amounts of heat would have to be present for years in order for continental-sized glaciers to be created. So where did the heat come from to carry out both processes—melt the sea ice back toward the poles so Hadley cells will deliver cloud moisture for snowfall, and evaporate water vapor with an

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<sup>1048</sup>I. Donnelly, *The Destruction of Atlantis*, (New York, 1983-19 ), p. 59.

air temperature below freezing? It requires, as Velikovsky suggested, heating of the oceans significantly and suddenly while cooling the atmosphere at the same time. These do not occur under uniformitarian conditions.

Emiliani's explanation in the following shows

" . . . as the northern ice sheets expand, the ocean surface cools, less moisture evaporates, and less precipitation falls on the ice sheet. This leads to thermal equilibrium between ice and ocean. Equilibrium is soon broken, however, when the northern areas of the North Atlantic become covered with pack ice. At present pack ice covers the Arctic [Ocean] to an average thickness of 3 m[eters]. Evaporation from an ice surface is negligible, compared with that from an open water surface. When pack ice forms over the North Pacific and North Atlantic, evaporation from the ocean, which fed the ice sheets stops, and the ice sheets are starved."<sup>1049</sup>

During the Ice Age, the sea ice, as Schneider told us, reached as far south as Spain in the Atlantic and to the northern Pacific, as well. Thus, how did the continental ice caps receive moisture for the many thousands of years of the last Ice Age? Shortly after an Ice Age begins, the seas around the northern regions freeze permanently and the ice caps starve and must melt away. While the continental ice sheet is melting, the sea ice can still survive because the land is still covered by white ice which reflects light. The pack ice on the oceans is still adjacent to open water and will receive snow so that it would melt only after much of the lands covered by ice melted, enabling the dark land to absorb light. The problems attendant to the Ice Ages are still unresolved.

What Velikovsky claimed is that during a celestial catastrophe, areas of the ocean boiled which produced immense amounts of atmospheric moisture which fell as immense rain showers in some regions, but as snow near the poles. His suggestion is eminently scientific because, under uniformitarian conditions, the great ice caps would never form. And this is fully corroborated by what is actually found in the ice caps, in terms of temperature swings, which will now be examined.

There is yet another fundamental contradiction to uniformitarianism found in the deeper Ice Age ice compared to that of the upper ice in Greenland and Antarctica. Since the ice is supposedly a direct reflection of temperature changes based on oxygen 18 to oxygen 16 isotopes in the layers, it should show predominantly only gradual temperature departures from the mean, as expected, based on uniformitarian theory. All such temperature changes would occur gradually over thousands of years. On the basis of Velikovsky's hypothesis, the amount of snow that fell during this period of darkness would not be in anyway related to gradual temperature change. Snow would have been derived from cold and warm water sources. Not only would the oceans boil in some regions, but meteors would have fallen into the oceans in cool regions, as well, throwing immense amounts of water and water vapor into the atmosphere.

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<sup>1049</sup>Emiliani, *Planet Earth*, *op. cit.*, p. 542.

Hurricanes sweeping over the entire Earth would then have carried this water vapor in the atmosphere from vastly different oceanic temperature regimes to the polar regions to fall, under normal conditions, as snow. Present-day amounts of snow which would have taken decades to fall, would have done so in a few days or weeks. This snow, derived from warm, cool, or cold oceanic regions, would contain totally different amounts of oxygen-18 or oxygen-16 mixtures. Two hundred or more feet of snow may have fallen at a time from either a warm or a cool oceanic area. This snow, under the burden of snow falling above, would be quickly compressed to form firn [ice crystals] and would create many layers via the rapid diffusion of oxygen-16 and oxygen-18 into the ice. But the overall property of the layers would be to create the appearance of decades of ice with either a very warm, cool or cold climatic temperature regime. Based on Velikovsky's catastrophic scenario, the ice, in which the great amounts of dust are found, should also show sudden, great temperature swings over, perhaps, years, decades, or centuries. Based on the uniformitarian concept, any temperature swings based on the Milankovitch theory, should be gradual and fairly long-term in duration.

This, then, is the second, crucial form of evidence with which we may determine whether or not Velikovsky's catastrophic hypothesis fits the data, or if that of the Uniformitarians does. What does the evidence show? According to Scott Lehman:

"[In September 1992,] came the first report from one of two teams drilling on Greenland, confirming that much of the period 8,000 [to] 40,000 years was marked by SUDDEN five to ten degree C [9 to 18F] switches in temperature over the ice sheet. In February came news from other teams that the switches were, in fact, jittery, embracing *large oscillations* in climate dating, in some cases less than five years. And then, in July came the further discovery that the past 8,000 years of relatively stable climate have been an oddity—the last time there was as little ice on Earth as today (the last Interglacial period), temperatures over Greenland varied even more wildly than during the glacial period, shifting as much as ten to twelve degrees C [18 to 21.6F] in just decades and remaining in place for as little as 70 years. Although climate modelers and geologists are racing to understand and test the implication of the new ice core data, one thing *seems certain*—the heat carrying capacity of the Atlantic Ocean must somehow be involved in producing the sudden climate change around Greenland."<sup>1050</sup> (Capitalization and emphasis added)

The very same great swings in temperature have also been found from examination of ice cores taken from the Antarctic continent. John Lewis reports, "The Greenland and Antarctic ice cores show . . . violent brief temperature drops of 20 degrees Celsius (about 36 Fahrenheit degrees) were common."<sup>1051</sup> What would cause the

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<sup>1050</sup>Scott Lehman, "Ice Sheets, Wayward Winds, and Sea Change," *Nature*, Vol. 365, (Sept. 9, 1993), p. 108.

<sup>1051</sup>John S. Lewis, *Rain of Iron and Fire*, (Reading, Mass., 1996), p. 114.

southern oceans surrounding Antarctica to become colder and warmer over periods of perhaps as long as 100 years? Comets would not be expected to create such frequent, long-lasting, climatic temperature changes, nor would volcanic eruptions create such wild swings of temperature lasting for decades. There are no Heinrich layers in these circum-Antarctic waters, and one cannot suggest the ice cap surged into the oceans to cool them for extended periods. Yet in Greenland and Antarctica the ice core shows extraordinary temperature swings that should have a scientific explanation but which presently have none.

Ward describes the climatic conditions that must accompany these great temperature swings.

"Dr. J. White of the Institute of Arctic and Alpine Research at the University of Colorado noted in a recent summary . . . that between 200,000 years ago and 10,000 years ago, average global temperature changed as much as 18F in a few decades. The current *average* global temperature is 59F. Imagine that it suddenly shot up to 75F in a century or less. Another of the researchers working on this problem, Dr. Minze Stuiver of the University of Washington, has told me that such dramatic changes could have taken place in as little as five *years*. We have no experience of such a world; such sudden perturbations in temperature would enormously affect the atmospheric circulation patterns, the great gyres that redistribute Earth's heat. At a minimum, these sudden changes would create catastrophic storms of unbelievable magnitude and fury. Yet such changes were common. . . . Imagine a world where storms that dwarf Hurricane Andrew lash the continents not once a century but several times each year, every year. Imagine a world where tropical belts are suddenly assaulted by snow each year. This was our world until 10,000 years ago when according to the new studies from Greenland, a miracle happened: The sudden shifts in the weather stopped."<sup>1052</sup>

According to Velikovsky, Venus, on a cometary orbit, created this sequence of disasters described and examined in this book.

What the researchers are scrambling to do is create ad hoc theories to warm up and cool down the Atlantic, Pacific, and Indian Oceans suddenly and drastically again and again over the past 100,000 or more years that represent the last Ice Age. They have been forced to suggest immense, recurrent floods, continental ice cap breakups over North America and Europe, but not for Greenland or Antarctica, and wild, spasmodic oceanic current swings every so often—none of which has ever been observed for such short time spans or was ever conceived to have occurred. The most disturbing problem for all these ad hoc theories is that, for the last interglacial period, these great climate swings were found in one Greenland core, but were absent in another, a monumental contradiction to the accuracy of the cores.

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<sup>1052</sup>Ward, *The Call of Distant Mammoths*, *op. cit.*, pp. 199-201.

In order to explain away the temperature swings, a three-day conference was held by the European and American ice core teams to present papers stating that these temperature swings may not have existed during the last Interglacial. This, of course, could not be proven definitively, but the enigma of such broad, sudden temperature variations is a major contradiction to the uniformitarian model. Which core, the one reflecting climate swings, or the one without them, is to be accepted as correct?

If the Atlantic, Pacific, and Indian Ocean cooled the atmosphere and then heated it up again, greatly and suddenly, every few years, decades or centuries, then the land masses—the continents adjacent to them—should have climate regimes that reflect the ocean temperature's same pattern. Land masses reflect climate change rapidly, because land does not hold heat as well as water. Therefore, if the oceans cooled and heated the atmosphere causing the temperatures found in the ice cores to swing so suddenly for these various periods, it should most definitely also be reflected and correlated with the temperature data found on the land. However, if the snow, was deposited catastrophically over a very short time period, as Velikovsky's theory suggests, then there would be no indication that these temperature swings occurred in land-based measurements. Again, what does the evidence show?

Regarding ice cores and varves from lake sediments, the latter, which were corrected to correlate with the Ice Age chronology, according to Hans Oeschger, "Such pronounced correlations are not found in climatic records from the North American continent."<sup>1053</sup> Although he had found these temperature shifts in the Dye 3 ice core, he admitted they failed to exist in the varve record for North America.

However, there is another land-based core for most of the past half million years which is also found in North America. This is the Devil's Hole core from the Nevada Desert. If the Milankovitch theory for gradual changes in temperature had any validity at all, the gradual swings required by this theory should also be reflected in this core. However, according to Richard Monastersky, "the Devil's Hole record with its superior chronology, shows that the timing of specific events in the last 500,000 years does not match the predictions of the Milankovitch theory. . . ." <sup>1054</sup>

What this core conclusively proved is that some of the allegedly coldest and warmest periods required by Milankovitch were not only not in place in the Devil's Hole core, but were in some cases shown to be warm when it was expected to be coldest, and vice versa.<sup>1055</sup> Therefore, the Milankovitch theory is in fundamental contradiction to these temperature measurements.

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<sup>1053</sup>Hans Oeschger, "Long-Term Climate Stability: Environmental System Studies," *The Ocean in Human Affairs*, S. Fred Singer, ed., (New York, 1990), p. 64.

<sup>1054</sup>R. Monastersky, "Devil's Hole Heats Up Debate Over Ice Ages," *Science News*, Vol. 142, (Oct. 10, 1992), pp. 142-143.

<sup>1055</sup>J. M. Landwehr, Isaac J. Winograd, T. B. Coplen, "No Verification of Milankovitch," *Nature*, Vol. 368 (April 14, 1994), p. 594.

Monastersky called the Devil's Hole core a "superior chronology" of the temperature of the northern hemisphere over the past half million years. According to Wallace S. Broecker of the Lamont-Doherty Oceanographic Observatory at Palisades, New York:

"In my estimation, the New Devil's Hole chronology is more firm than any other available isotopic age in this [time] range. Nowhere else has a high degree of concordance between  $^{234}\text{U}$ - $^{238}\text{U}$  and  $^{230}\text{Th}$ - $^{234}\text{U}$  ages been achieved. No other archive is better preserved. No other record has so many stratigraphically ordered radiometric ages. . . .

"Climatic modelers should start preparing themselves for a world without Milankovitch."<sup>1056</sup>

But the most important question with respect to our discussion is whether or not these sudden, large, ice core temperature swings were found in the Devil's Hole core? And here again Velikovsky's theory is fully supported by this research. Not a single sudden switch in temperature was found to exist, just as with the evidence found in the varve chronology.

According to Isaac J. Winograd, who has been deeply involved with Devil's Hole research of the U. S. Geological Survey in Reston, Virginia, specimens of a core were sampled every five millimeters or so down the length of the core. Because Devil's Hole receives its water from aquifers, it would take several years for a temperature change to register. Therefore, very short-term oscillations in the surface water temperature would not be recorded. However, longer periods of continually averaged temperatures would show themselves. Although even with this five millimeter space sampling, it was estimated that 25 to 35 percent of the climate swings should be evident. Under no reasonable consideration would it, therefore, be probably that not a single temperature oscillation would be found. Nevertheless, after a full examination of every one of the samples, not a single one of these oscillation events *was* found!<sup>1057</sup>

R. L. Edwards, *et al.*, wedded to Milankovitch and ice core dates have attempted to discredit the findings of the Devil's Hole core based on Protactinium-231 dating of coral reefs in the Caribbean. What they found were certain agreements with the Devil's Hole core while other data points did not. Thus, they argued the Devil's Hole climate chronology was only an indication of the local climate in that area and did not reflect the global variations.<sup>1058</sup> However, Winograd and his Devil's Hole core research associates in their response in Quaternary Research were fully able to demonstrate that Devil's Hole

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<sup>1056</sup>Walter S. Broecker, "Upset for Milankovitch Theory," *Nature*, Vol. 359, (1992), p. 780.

<sup>1057</sup>Isaac J. Winograd, "Abstract", *EOS*, Vol. 77, No. 17 (April 23, 1996), *Supp.* p. F169.

<sup>1058</sup>R. L. Edwards, *et al.*, "Protactinium-231 dating of carbonates by thermal ionization mass spectrometry: Implications for Quaternary climate change," *Science*, Vol. 276, (1997), p. 782.

core data had a high linear correlation in terms of the Oxygen 18 isotope used to determine temperatures in cores with Specmap and Vostok records. It was in phase with these other cores by 0.86 and 0.92 and thus could not reflect only the local climate of the American southwest.<sup>1059</sup>

Walter Broecker, in examining the numerous temperature swings found in the Greenland ice cores, has proposed these were caused by ocean-current swings as a possible solution, but admits "we don't know how it [the ocean current swings] could happen. . . ." <sup>1060</sup>

But this does not explain away the overwhelming contradiction from the Devil's Hole core nor from the North American varve record which showed no such temperature swings as those found in the Greenland and Antarctic ice cores.

Thus, the entire gamut of temperature swings found in the Greenland ice cap are not found in the varve chronology record nor in the Devil's Hole core record. The contradiction is of enormous proportions. In essence, we are being asked to believe and accept an ice core temperature record that suggests that the Atlantic Ocean suddenly became extremely cold and then became suddenly quite warm repeatedly, so that the water in it, which fell on Greenland as snow, would reflect these oceanic coolings and heatings. At the same time, we are also asked to accept that these great oceanic temperature swings somehow never once affected the temperatures over North America at all.

Now, why would neither the varve chronology nor the Devil's Hole core chronology indicate any of these ice core temperature swings if they indeed occurred? The fact that they do not occur indicates that the temperature swings have nothing to do with the uniformitarian theory proposed. Since, according to Velikovsky, most of the ice caps were formed in a year or so, there could not have been multiple sudden temperature swings during the Ice Age. The temperature changes, in the present—post-glacial era—tend to be long-term and gradual, and the sizes of the rises and falls in temperature are never anywhere as great as what was found in the deeper ice where the variations were as great as 20F. Why would the present era, compared to all the past millennia of Ice Age and even interglacial climate, appear to be the only one with a steady temperature regime?

According to the latest leading theory, it is assumed that "the Canadian ice sheet, . . . alternately stored and released huge quantities of fresh water into the North Atlantic . . . [which] would have diluted the salt water that drives the deep Atlantic current significantly altering global ocean circulation."<sup>1061</sup> This is supposed to have left

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<sup>1059</sup>Isaac Winograd, *et al.*, "Duration and Structure of the Past Four Interglacials," *Quaternary Research*, Vol. 48, (1997), pp. 141-154, see fig. 7, p. 147 and fig. 8, p. 148.

<sup>1060</sup>Walter Broecker, "Will Our Ride Into the Greenhouse Future be a Smooth One?" *GSA Today*, Vol. 7, No. 5, (May 1997), p. 5.

<sup>1061</sup>Wallace S. Broecker "The Once and Future Climate," *Natural History*, Vol. 105, (September 1996), p. 34.

imprints in desert varnish in rocks from the Great Basin which have recently been found by Tanzhuo Kiu and Ron Dorn. These bands of yellow followed by orange are suspected of being evidence of these great floods. Nevertheless, it is admitted that "no method exists to directly date individual varnish layers."<sup>1062</sup> What is not admitted or discussed is the fact that if for scores or thousands of years the Atlantic Ocean's temperature supposedly varied by up to 23F, this oscillation should be found on the land from varves and Devil's Hole, which denies the hypothesis presented to support these as actual variations in temperature.

What is also overlooked is that these temperature swings are greater than anything related to the formation of the Ice Age ice caps. It was formerly expressed that only a small change in temperature brought on an Ice Age. But let us assume that all the above-mentioned temperature records were made to agree with each other so as to substantiate the ice core record of temperature oscillations in the Earth's climate. Sudden climate swings of about 23F would be devastating to all life on the continents and oceans, as well. The climate theorists, after all, suggest that small, gradual thermal changes devastated and drove to extinction the mammoths and other Ice Age mammals. Oscillations of the type envisaged by the ice core theorists would have been even more devastating than any temperature swing related to creating Ice Ages. Life in the oceans would have had several extinctions as well. But none of this is found in the record.

Sagan and Turco point out: "A prolonged global temperature drop of a few degrees C would be a disaster for agriculture; by 10C [18F] whole ecosystems would be imperiled. . . ." <sup>1063</sup> If an 18F temperature shift would imperil whole ecosystems, an additional 5F would create numerous Ice Age extinctions. These, of course, as pointed out by Haynes, did not happen. Certain trees thrive in cold weather during part of the year while others only thrive in moderate temperate climates. These thermal conditions are crucial for their life cycles. How can trees demanding cold winters survive the up to hundred-or-more-year spells of very warm winters, or vice versa? In either sudden, long cold spells, or long warm spells, both the trees and other vegetation and the animals dependent upon them for food would become extinct. How did mollusks, insects, and other cold-blooded animals adapted to warm winters survive such sudden cold snaps? The food chains during these sudden alterations in climate would have been so badly disrupted that extinctions would have been more the rule than the exception (which exception they are) during the Ice Age. I suggest that most of the organisms subjected to such sudden gross temperature oscillations over relatively long time periods of decades to centuries would never have come through this era, but would have become extinct. The entire rubric of these oscillations is contradicted at too many levels of evidence by too many phenomena.

This evidence fully supports the view that only the oceans were heated in places for a very short time so that the water vapor that fell as snow reflected these high oceanic

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<sup>1062</sup>*Ibid.*, p. 36.

<sup>1063</sup>Sagan, Turco, *A Path Where No Man Thought*, *op. cit.*, p. 22.

temperature conditions in the ice cap layers, and that this all occurred suddenly and, therefore, catastrophically.

The cause or causes of the Ice Age have defied explanation from the very beginning. Uniformitarianism, rather than leading to understanding of this phenomenon, has led to chaos, just as with the cause of the Pleistocene extinction. In May of 1997 Walter Broecker, the world's leading climate authority, after analyzing the data related to climate change during and after the Ice Age, was driven to comment:

"What [the above data] . . . tells us is that somehow Earth was in a much colder condition during glacial periods. To my way of thinking, no one has adequately explained how this could have happened. We now have new evidence from glacial age corals . . . and from glacial age ground water . . . that the tropics may have been as much as 5 degrees C [9 degrees F] colder during glacial times. How could the climate of Earth have changed so much in the absence of any strong external forcing?"<sup>1064</sup>

Broecker fully admits we do not understand the nature and causes of Ice Ages and suggests something "external" to all processes we now know "forced" these momentous climate changes. But he will not consider the possibility of a pole shift which will do just that. Ultimately, Broecker was forced to the following admission of failure:

"My lifetime study of Earth's climate system has humbled me. I'm convinced that we have greatly underestimated the complexity of the system."<sup>1065</sup>

After 150 years of research, uniformitarianism has led several generations of sincere researchers to dead ends and conflicting and/or contradictory evidence. Instead of reaching convergence, the data has led to confusion and divergence. The evidence does not coincide with nor fit uniformity either in its timetable or in its processes, while the data clearly is a natural outcome of a series of catastrophes. Little or no evidence correlates and corroborates the concept of uniformity, but it does so uniquely with Velikovsky's catastrophic scenario. The tool of mythology which Velikovsky employed along with the geophysical evidence, clearly explains these phenomena in clear and rather coherent terms. His approach surely deserves a better appraisal than that furnished by hostile groups unalterably opposed to his thesis, groups that have been shown in books such as *Carl Sagan and Immanuel Velikovsky* and *Stephen J. Gould and Immanuel Velikovsky*, to have misrepresented his evidence and theory relentlessly.

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<sup>1064</sup>Broecker, *GSA Today*, *op.cit.*, p. 5.

<sup>1065</sup>*Ibid.*, p. 7.

## POLESHIFTS, CATASTROPHES, AND MYTHS

". . . [S]ome of the moderns have indulged this folly [of explaining natural endeavoured to build a system of natural philosophy on the first chapter of Genesis, on the Book of Job, and other parts of scripture. . . . And this folly is the more to be prevented and restrained, because . . . fantastical philosophy . . . spring[s] from the absurd mixture."

Francis Bacon  
*Collected Works*, Vol. 3  
(Phila., Penna., 1857), p. 351

- "Athenian: Do you consider that there is any truth in the ancient tales?
- Clinias: What tales?
- Athenian: That the world of men has often been destroyed by floods and plagues, and many other things, in such a way that only a small portion of the human race survived.
- Clinias: Everyone would regard such accounts as perfectly credible.

Plato, *Laws*, Vol. 1, Book III  
transl. R. G. Bury  
(Cambridge, Mass., 1926), pp. 167-173

"A significant legend recounted by [Ignatius] Donnelly was that of the Chinese astronomers were said to have reported that following the deluge, the moon, sun, and stars were seen to rise and set in new locations, on the horizon. Only a change in the Earth's axis would have produced this effect, and it is very unlikely that a primitive people would have dreamed up this legend if it had not actually happened. Too often, men of science have sneered at legends as unscientific, while themselves, postulating speculations not much more than legends."

Allan O Kelly  
*Impact Geology*,

The process of citing legends from oral and written ancient history was employed by many of the early catastrophists. For example, Cuvier,

" . . . cites references from ancient Chaldean, Hindu, Persian, and Chinese records to prove his point, [of recent global catastrophe], and mentions [Alexander von] Humboldt's suggestion that references to a deluge may also be found in the 'barbarous hieroglyphics' of the American Indians."<sup>1066</sup>

Louis Agassiz stated:

"We have as yet no clue to the source of this great [Ice Age] change of climate. Various suggestions have been made—among others, that formerly the inclination of the earth's axis was greater."<sup>1067</sup>

As was pointed out earlier, even Benjamin Franklin was driven to suggest "the Earth had anciently been in another position."

The concept of catastrophism was fought tenaciously by the scientific and academic communities for over 150 years. Lyell attacked Whiston who claimed that, in ancient times, the Earth was struck by a comet which brought devastation to the planet. Lyell further wrote that Whiston had "retarded the progress of truth, diverting men from the investigation of the laws of sublunary nature, and inducing them to waste time in speculations on the power of comets to drag the waters of the ocean over the land . . . ." <sup>1068</sup> Edwin H. Colbert, of the American Museum of Natural History echoed this anticatastrophist sentiment as have many others before him. "Catastrophes are the mainstay of people who have little knowledge of the natural world, for them the invocation of a catastrophe is an easy way to explain great events."<sup>1069</sup> Even *The New York Times*, in an editorial, "Miscasting the Dinosaur's Horoscope" for April 2, 1985, p. A26 attacked the idea of catastrophism with "terrestrial events like volcanic activity, or change in climate or sea level, are the most immediate cause of mass extinctions. Astronomers should leave to the astrologers the task of seeking the causes of earthly

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<sup>1066</sup>Albritton, *The Abyss of Time*, *op. cit.*, p. 136.

<sup>1067</sup>Louis Agassiz, *Geological Sketches, Vol. I*, (Boston, 1866), p. 21.

<sup>1068</sup>Stephen Jay Gould, *Times Arrow, Times Cycle*, (Cambridge, Mass., 1987), p. 139.

<sup>1069</sup>E. H. Colbert, *Dinosaurs: Their Discovery and Their World*, (New York, 1961), p. 252.

events in the stars." Anthony Hallem called catastrophism "the *deus ex machina* of strange happenings in outer space."<sup>1070</sup> These are damning condemnations.

The theory presented in this book is that the Ice Age ended not 10,000 years ago, as uniformitarians and some catastrophists propose, but that it ended with the onset of the hipsithermal, as Velikovsky claims, about 8,500 years ago, when a catastrophe caused the polar axis to move perpendicularly to the Earth's orbital plane. Up until about 3,500 years ago, the Earth experienced a Golden Age described in the mythology of the human race. That is, the hipsithermal was the Golden Age, but ended, according to Velikovsky, about 3,500 years ago during a catastrophe created by the near collision of the Earth with proto-planet Venus that reoriented the axis to a greater obliquity, which ushered in a new cold Ice Age that we live in today. This book further submits that these changes in the climate were due not only to poleshifts, but also to sudden plate tectonic motions.

The concept that Velikovsky posed in 1950, that the solution for the cause of the Ice Age is of an extraterrestrial catastrophic nature, is just the direction that the scientific community is belatedly groping toward. The various disciplines have arrived at a watershed with respect to the Pleistocene extinction, and scientists involved in this research are beginning to wonder if some global or near global catastrophe has occurred.

For example, Haynes wonders:

"The question . . . [of the Pleistocene extinction] is this: Were they killed off or did they die off? It is tempting to explain mass extinctions by finding unique and irresistible agents that clearly are not part of the ordinary ebb and flow of biotic change on earth. For example, in the case of the Cretaceous-boundary [the dinosaur] extinctions, the possibility of extraterrestrial bodies catastrophically impacting the earth has been eagerly accepted by some scholars as a robust explanation for the sudden disappearance of so many dinosaur species."<sup>1071</sup>

Pielou states:

"The numerous 'environmental' [or climate] theories put forward to account for the extinctions—. . . all fail (in my opinion) in being too farfetched or too 'particular'. . . . Moreover, they all seem to overlook the fact that tremendous environmental changes occurred during the Wisconsin glaciation as well as at the end of it. The overkill theory has fatal objections too.

"Could it be that some short-lived catastrophe killed off vast numbers of all large mammals (or all large herbivores) and that species now extant are those few that managed to build up their numbers again after the catastrophe was over? If so, what was the catastrophe? It would have been one that left no evidence

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<sup>1070</sup>A. Hallem, "The End—Triassic Bivalve Extinction Event," *Paleogeography, Paleoclimatology, Paleoecology*, Vol. 35, (1981), p. 36.

<sup>1071</sup>Haynes, *Mammoths, Mastodonts, & Elephants*, *op. cit.*, p. 316

[such as a huge crater] of its occurrence and was short lived enough to leave no perceptible gap in the fossil record. All that can now be said is that the cause of the great mammal extinction is still an unsolved puzzle."<sup>1072</sup>

Schultz remarks with regard to the cause of the end of the Ice Age, "One can't help suspecting that something has been moving. Maybe the poles. Maybe the continents. Maybe both,"<sup>1073</sup> Elsewhere she states:

"The susceptibility of various sites to glaciation would have been determined not by just a few simple conditions but by a whole interrelated set of them—latitude, elevation, clarity of atmosphere, position in relation to storm tracks, water bodies, ocean currents, prevailing wind direction, and other factors, *including the possibility that the poles may have had different positions or that the continents may have moved.*"<sup>1074</sup> (Emphasis added)

Or as Sanderson states:

"At this point, we are forced to consider something that has been anathema to scientific orthodoxy for a century, now—namely, the idea of cataclysms. . . . But the real question is, can a whole 'ice age' come on in an hour . . . This is a distressing thought, perhaps, but frankly, it would seem to be the only feasible explanation of some of the observed facts. . . ." <sup>1075</sup>

Some astronomers and geologists have not been timid and have now begun to say unabashedly that these megafauna were destroyed by cosmic catastrophes. Sir Fred Hoyle of England, a Nobel laureate, now claims, "Whole herds of mammoths perished all in a moment. They did so by a sudden melting of the permafrost on which they spent their lives, causing them to become immersed in icy water, which then refroze within a matter of hours. Only a blast of heat from the sky could have had such an effect, a blast such as occurred at the Tunguska river." Hoyle claims that these events are contained in ancient myth and the Bible.<sup>1076</sup> Otto Muck, a distinguished German physicist, engineer, and inventor, states:

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<sup>1072</sup>Pielou, *After the Ice Age*, *op. cit.*, p. 265.

<sup>1073</sup>Gwen Schultz, *Ice Age Lost*, *op. cit.*, p. 79-80.

<sup>1074</sup>*Ibid.*, p. 73.

<sup>1075</sup>Sanderson, *ABU*, *op. cit.*, pp. 90-91.

<sup>1076</sup>Hoyle, *The Origin of the Universe and the Origin of Religion*, *op. cit.*, p. 40.

"Yet they [the mammoths] were preserved, and remained preserved to this day in the arctic climate of modern Siberia. So the mammoths must have entered the cold storage conditions very soon after their death. This means that the critical transition from one pattern of climate to another took place within a very short period.

"This cannot be explained by the theory of continental drift. The giant Siberian platform could not conceivably have drifted 2,100 miles (3,500km) within four days. It could only have been the North Pole that shifted so suddenly. . . .

"This inescapable conclusion will become more intelligible if we . . . use the analogy of the Earth as a spinning top. External influences will cause the spinning top to wobble, and the giant spinning top of Earth instantly reacts to the impact of Asteroid A and the eruption of huge quantities of material . . . the mammoth carcasses in northeast Siberia show how quickly this took place."<sup>1077</sup>

Muck claims that myths recall this kind of catastrophic event.

"This is a result that can be scientifically verified. Linking it again with the myths, we can now understand the story of Helios-Phaethon who lost control of the Sun's chariot and careened across the sky. And we can see how Hercules, who visited the giant Atlas on his way to obtain the apples of the Hesperides, ripped open the Strait of Gibraltar and stopped the sun's chariot in its tracks; also the brief verse in the Edda which states that the sun lost his place among the stars."<sup>1078</sup>

American Physicist Louise F. Young states:

"While the Milankovitch theory provides a very promising explanation for the rise and fall of glaciations within an ice epoch, it does not explain the large-scale pattern. The temperature changes set up by deviations in the planet's movement around the sun occur much too frequently to account for the timing of the major ice epochs. And they are too small to trigger a glacial age except when some other factors also reduce the earth's temperature. For example, an abrupt shift of earth mass [Charles Hapgood's theory] could alter the angle of tilt as a spinning gyroscope can be made to precess by giving it a nudge. Perhaps relatively rapid movements of plates caused such imbalances. Other possibilities include THE IMPACT OF GIANT METEORITES *that gave the planet a nudge*

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<sup>1077</sup>Otto Muck, *The Secret of Atlantis*, transl. Fred Bradley, (New York, 1976), pp. 217-218.

<sup>1078</sup>*Ibid.*, p. 219.

*large enough to change the wobble and the tilt of the axis.*<sup>1079</sup> (Capitalization and emphasis added) [Young does not mention the myths.]

The Italian astronomer Emilio Spedicato, on the basis of his analysis of ancient literary texts, has suggested that the Pleistocene ended when a large comet struck the Earth<sup>1080</sup> Austrian geologists E. Kristian-Tollmann and Alexander Tollmann, through their analysis of the geological evidence, propose a major comet stream impact 9,500 years ago in the ocean that ended the Pleistocene and ushered in the Holocene.<sup>1081</sup> Like the theory of Clube and Napier,<sup>1082</sup> their comet breaks up into many pieces, some of which then strike the Earth in the ocean creating the deluge. Also, like others, they propose that all the world's ancient myths and cosmologies, both in oral and written traditions, have in great measure originated from this catastrophic event.

Gerrit L. Verschuur cites their work thus:

"The impact triggered global earthquakes of unimaginable magnitude which deformed large landscapes totally swallowed up islands in the sea, raised or broke down major mountain chains, moved the earth's crust like a storm-swept sea, crushed rocks, flung up trees into the air, shot fountains of water into the sky, all of it reported [in myth and legends] by eye witnesses."<sup>1083</sup>

John and Mary Gribbin describe the mythic evidence for recent celestial catastrophism thus:

"Yet, the random nature of these [celestial] acts of terrorism can be seen as an argument in favor of the idea that the gods were comets. One of the key features of Greek and Roman mythology is the capriciousness of the gods, often acting on whim, rather than logical reason. Using the account of the story of the origin of the Universe and the history of the gods given by the Greek poet Hesiod . . . in his *Theogony*, Clube and Napier offer a deliciously persuasive interpretation of the way religion itself developed and changed as events in the

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<sup>1079</sup>Louise F. Young, *The Blue Planet*, (Boston, 1983), pp. 149-150.

<sup>1080</sup>Emilio Spedicato, "Apollo Objects, Atlantis, and The Deluge," *New England Antiquities Research Association Journal*, Vol. XXVI, 1 & 2, (1991), pp. 1-14.

<sup>1081</sup>Alexander Tollmann, E. Kristian-Tollmann, "The Flood Impact," *Mitteilungen der oesterreichischen geologischen gesellschaft*, Vol. 84 (1991), pp. 1-63.

<sup>1082</sup>Clube, Napier, *The Cosmic Serpent*, (New York, 1982); *The Cosmic Winter*, (Oxford, 1990).

<sup>1083</sup>Gerrit L. Verschuur, *Impact The Threat of Comets and Asteroids*, (New York, 1996), p. 103.

heavens unfolded. Olympus, the home of the gods, is seen as a great comet, moving across the sky where Zeus reigns hurling his thunderbolts earthward from time to time."<sup>1084</sup>

All this, of course, comes straight out of Velikovsky and new theories based on the myths are now very much in vogue as the evidence of a kind of bandwagon effect seems to have come late on the heels of Velikovsky's work.

Researchers D. S. Allen and J. B. Delair in another "me-too" Velikovskian type scenario, *When the Earth Nearly Died*, using gobs and gobs of Velikovsky's materials from *Earth in Upheaval* and *Worlds in Collision* make the claim that a supernova of a nearby star sent a massive part of itself through the solar system seen by ancient man as Typhon, etc., which wrecked havoc in the solar system and ended the Pleistocene by a pole shift. To Velikovsky's geological and mythic material they add a great deal of other evidence to support their theory. Their mythological evidence, in large part, like so many others lifted directly from Velikovsky's work, is presented to corroborate their thesis.

Lewis fully admits, "Mythology fairly drips with frightening allusions to cometary omens, celestial serpents, fiery dragons, mass disasters inflicted from above, entire cities destroyed by 'lightning bolts' . . ." <sup>1085</sup>

Speaking of the interpretations of Clube and Napier, John and Mary Gribbin write that the literature of the ancient world depicts a great comet that destroyed the Earth and these legends come from such diverse regions as Mesopotamia, Egypt, Greece and the ancient Norse:

"A circumstantial piece of evidence in support of cometary impacts in ancient times is that all cultures seem to perceive comets as harbingers of doom. . . . Why would people who were every bit as intelligent as us, even though less advanced technologically, imagine comets brought death and destruction, if that death and destruction had not been seen, if not with their own eyes then with the eyes of recent ancestors."

"All this is conventionally interpreted as a work of fiction; but it reads like an accurate description of a series of . . . [catastrophic] events. Even if it were fiction, what put the idea in to the writers' heads? All fiction, after all, is based on fact." <sup>1086</sup>

James W. Mavor, Jr., in discussing the concepts of cometary streams striking the Earth and causing the eruption of the Thera volcano at Santorini concludes,

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<sup>1084</sup>John and Mary Gribbin, *Fire on Earth*, (New York, 1966), pp. 206-207.

<sup>1085</sup>Lewis, *Rains of Iron and Fire*, (Reading, Mass., 1996), p. 2.

<sup>1086</sup>John and Mary Gribbin, *Fire on Earth*, *op.cit.*, p. 205 and p. 207.

"Scholars of comparative religion today generally agree that myths are not essentially imaginary, but rather, the means and the mode of expression of ancient peoples, archetypes of which governed their concepts of the past, present, and the future. With the acceptance of the idea that myth may be history, the interpretation of myth has changed into the determination of what an observer thousands of years ago actually sensed as distinct from the scientific record that has come down to us. The [ancient] observer's interpretation of what he senses is colored by his preconceived notion of what he expects to sense based on experience. Catastrophe theory, as a tool to explain biological and cultural discontinuities of the past, has blossomed among scientists who accept that extrapolation. . . . Out of the marriage of scientific discipline and the creative interpretation of myth come the theories of earth history, stretching as far back as myths go, [that celestial catastrophes happened in ancient times] has played a major role in the growing acceptance of both mythology as history and of catastrophe theory itself."<sup>1087</sup>

To some extent, if Velikovsky is correct, one may, in large measure, agree with William Irvin Thompson who wrote "What if the history of the world is 'a myth,' but myth in the remains of the real history of earth."<sup>1088</sup>

To be sure, the flood gates of recent catastrophism based on myths are opening and we can expect to be deluged by recent cosmic catastrophist theories from the scientific establishment. As astronomer Duncan Steele now charges, American astronomers went too far when they rejected Velikovsky and his theory. He claims that the ancient myths do, indeed, describe cosmic catastrophes:

"The real problem for science is astronomers, in America in particular, became so entrenched and vehement in their criticisms of Velikovsky's astronomical nonsense that their minds also became instilled with not only a rejection of, but also a nonconsideration of the possibility that the myths and records of past civilizations might contain important information about what was happening in the sky in pre-modern times. In fact, the similarity between the legends of disparate human cultures are startlingly similar. In scientific publications I have pointed out that Australian Aborigines and New Zealand Maoris have oral traditions of strong rocks falling from the sky causing awful fires and many deaths, and this scenario is common in the myths of other peoples. On one hand astronomers have prided themselves in instructing geologists that impact catastrophes were responsible in part for shaping of the planet, but on the other hand, they have been blind to the fact that they have

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<sup>1087</sup>James W. Mavor, "Atlantis and Catastrophe Theory," *Oceanus*, Vol. 28, No. 1, (Spring 1985), p. 51.

<sup>1088</sup>W. I. Thompson, *At the Edge of History*, (New York, 1979), p. 175.

made a uniformitarian assumption when it comes to their own science. That the sky now is as it ever was, at least while humans walked the Earth. There is ample evidence not only from historical records of various forms, but also from analysis of this century . . . that around 5,000 years ago, the sky did not appear as quiescent as it does now, and that since that time there have been other disturbances of the heavens producing conflagration below."<sup>1089</sup>

Clube and Napier describe the conditions which led to the dismissal of Velikovsky's theory by the vast majority of scientists and academics:

"It is interesting to note that the Biblical catastrophists were all outsiders of one sort or another. Radlof [in Germany] was at first regarded by his contemporaries as a brilliant linguist, but as his ideas departed more and more from the mainstream, so he became more and more isolated, and died in obscurity; even the date of his death being unknown. Donnelly was regarded as a talented orator and statesman, but he seemed unable to tow the party line for long and his increasingly maverick opinions ensured that his political career was ultimately a failure. Velikovsky was a psychiatrist who had studied under Freud [his pupil] but whose incursion into the domain of astronomy was to prove an intellectual disaster.

"What is significant in the Velikovsky affair is not so much his scientific proposition, which is an easy target, as the vitriolic reaction of the American astronomical community to it. Little attempt was made by the critics to evaluate the historical information; that there might be more things in heaven and Earth than were apparent in the astronomy of 1950 that Velikovsky and his predecessors might have been detecting the signal of real events in the noise of ancient myths, does not seem to have occurred to them: celestial portents had been more than just tamed, they had become unthinkable.

"We have now . . . the labyrinth story of mankind's reactions to the events in the sky. We have seen how preoccupation with the sky, and fear of it, was an integral part of the earliest civilizations. There was a clear perception that catastrophe might from time to time be visited on the Earth from above."<sup>1090</sup>

At a major scientific conference on catastrophism, E. H. Levy, the co-discoverer of Comet Shoemaker-Levy, whose pieces struck Jupiter, emphasized in the opening paper that new research is required to deal with recent cosmic catastrophes:

"It is conceivable that other impact events have occurred within or near historical times. I have occasionally mused that one or two such events may be

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<sup>1089</sup>Duncan Steele, *Rogue Asteroids and Doomsday Comets*, (New York, 1995), pp. 155-156.

<sup>1090</sup>V. Clube, B. Napier, *The Cosmic Winter*, (Cambridge, Mass., 1990), p. 125.

recorded vaguely in our cultural memory, perhaps meandering and evolving through generations of myth and legend, ending up as religious stories of miraculous events. We have no evidence one way or the other; but it is at least conceivable."<sup>1091</sup>

On the other hand, Martin Gardner and his associates at the *Skeptical Inquirer*, while all this foment is unfolding regarding the mythic interpretation of historical celestial catastrophism, in their usual dogmatic fashion, dismiss myth as only "bizarre speculation."

"To support his conviction that the Old Testament is accurate history, Newton worked out an elaborate chronology of Earth's history, drawing on astronomical data such as eclipses and star motions, and legend . . . which he took as genuine events. With incredible ingenuity he tried to harmonize Biblical history with secular histories of the ancient world. It is sad to envision the discoveries in mathematics and physics Newton might have made if his great intellect had not been diverted by such bizarre speculation."<sup>1092</sup>

But time is passing by Gardner and his ilk, gradually leaving him and those at the *Skeptical Inquirer* to fight a rear guard battle against the trend that is now growing in the heart of science.

Ralph Abraham, Professor Emeritus at the University of California, however, applauds this mythic approach employed by Velikovsky and castigates those like Gardner, Sagan, Asimov, and Gould, who criticized him for using myths as evidence.

"Velikovsky saw what other scholars were unable to see, because he relied on evidence that they had chosen to neglect: the accumulated records of human experience. Natural scientists who scorned these records put themselves in the position of the early astronomers who held that no truly respectable scholar should resort to the telescope. They denied a creative new idea on the ground of [their] dogma which they held to be truth."<sup>1093</sup>

But the concept that myth does indeed contain historical evidence was recognized by various authorities. Giorgio de Santillana fully acknowledges this concept.

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<sup>1091</sup>E. H. Levy, "Early impacts: Earth emergent from its cosmic environment," *Hazards Due to Comets and Asteroids*, Tom Gehrels ed., (Tucson, Ariz., 1994), p. 6.

<sup>1092</sup>Martin Gardner, "Isaac Newton: Alchemist and Fundamentalist," *Skeptical Inquirer*, (Sept/Oct 1996), p. 15.

<sup>1093</sup>Ralph Abraham, *Chaos, Gaia. Eros*, (San Francisco, 1994), p. 194.

"We can then see how so many myths, fantastic and arbitrary in semblance . . . may provide a terminology of image motifs, a kind of code which is beginning to be broken. It was meant to allow those who knew how to determine unequivocally the position of the planets in respect to the Earth, to the firmament, and to one another; to present what knowledge there was of the fabric of the world in the form of tales about 'how the world began.' There are two reasons why this code was not discovered earlier. One is the firm conviction of historians of science that science did not start before Greece and that scientific results can only be obtained with the scientific method as it is practiced today (and as it was foreshadowed by Greek scientists). The other reason is the astronomical, geological, etc., ignorance of most Assyriologists, Aegyptologists, Old Testament scholars, and so on: the apparent primitivism of many myths is just the reflection of the primitive, astronomical, biological, etc., etc., knowledge of their collectors and translators. Since the discoveries of Hawkins, Marshack, Seidenberg, van der Waerden (*Geometry and Algebra in Ancient Civilization*, New York, 1983) and others, we have to admit the existence of an international paleolithic astronomy that gave rise to schools, observatories, scientific traditions, and most interesting theories. These theories which were expressed in sociological, not in mathematical terms, have left their traces in sagas, myths, legends, and may be reconstructed in a twofold way, by going *forward* into the present from the material remains of Stone Age astronomy, such as marked stones, stone observatories [such as Stonehenge and stone circles aligned to celestial points] etc., and by going *back* into the past from the literary remains which we find in sagas, legends, and myths."<sup>1094</sup>

Modern scientists are perfectly willing to admit the possibility that stone age men around the world could build astronomical observatories such as Stonehenge and stone circles that appear to be calendars and give data of the heavens from them. Yet, these same modern scientists, knowing of these astronomical structures, suggest that the myths, sagas, and legends about the celestial bodies cannot be evidence of any value by these same people.

Philologist and historian Cyrus H. Gordon, in his chapter which deals with astral religion, admits that there is value to be derived from ancient legends.

"The question arises: are all these legends [of ancient people] the inevitable and universal products of the human mind from one end of the earth to the other, wherever men may be? I doubt it, nor do we have to go farther than ourselves to find the exact opposite. Western man is geared to the proposition that what is ancient is primitive and what is truly scientific must be modern. . . . Modern man has been tacitly assuming that having risen from the depths of

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<sup>1094</sup>Giorgio de Santillana, *The Origin of Scientific Thought* (New York, 1961), Prologue, cited in Paul Feyerabend, *Against Method*, (London, 1992), p. 36.

barbarism, we are moving onward and upward to a paradise on earth through technological achievement, as though wisdom were born with us. I am inclined to see in the bygone Golden Ages of legends in the Old and New World, the modified memories of . . . [the] past whose scattered traces provide us with sufficient clues for restoring it to the outline of history. . . ."1095

The contrast between what is myth and what is history was clearly outlined by Patrick Pender-Cudlip who shows:

"Most historians . . . share certain ideas about possibility and probability and it is these ideas, more than anything else, that determine how they distinguish between myth and history . . . no story has an inherent quality which makes it historical; it becomes historical not by being true but by being accepted as true. Conversely an unhistorical story 'myth' . . . is not necessarily an untrue story, but simply a story which is regarded as untrue. Neither myth nor history has any 'objective' existence from society. . . . Historians in different societies reconstruct the past in different ways for different reasons, using different criteria to distinguish between fact and fiction . . . which are a product of their cultural environment."1096

What each of these statements indicate is that presuppositions by scientists and historians act to determine what is unacceptable as myth and what is acceptable as history. While Velikovsky suggested the ancient collective memories of the human race are testament to what early peoples actually witnessed had occurred to the Earth via celestial catastrophes, modern scientists and historians often reject this repository as worthless, as did Gardner. But this approach can be restrictive and inimical to a possible discovery of ancient past catastrophic celestial events.

Even Stephen Jay Gould argues:

"Presuppositions become more serious when they restrict the range of hypotheses that scientists are willing to entertain in explaining phenomena. The restriction is particularly unfortunate when it rests upon a doctrine enshrined as unquestioned and obviously true and not recognized as only one possible bias among many . . . Hawkes, for example, rejected, as inadmissible *à priori*, the hypothesis of rapid polar wandering: 'The idea of polar wandering in a series of relatively short spurts from one stable position to another'—the 'random walk of the poles'—is heady wine to place before the paleographer! It constitutes 'a departure from the doctrine of uniformitarianism.' . . . But maybe the poles do

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<sup>1095</sup>Cyrus H. Gordon, *Before Columbus*, (New York, 1971), p. 78.

<sup>1096</sup>Richard Heinberg, *Memories and Visions of Paradise*, revised ed., (Wheaton, Ill., 1995), p. 183.

move rapidly. The claim should at least be investigated rather than being dismissed without a test."<sup>1097</sup>

In fact, Velikovsky cited K. A. Pauly who claimed in 1952, "We are fully justified in concluding that the lithosphere was displaced during the great Ice Ages, and that the displacements were the direct cause of the Alterations in climate during these periods."<sup>1098</sup> He goes on to cite W. B. Wright of the Geological Survey of Great Britain that

"The Earth's axis of rotation has not always had the same position; [and] . . . since it has now become obvious that geological history has witnessed many changes in the position of the climatic zones on the surface of the Earth and that at least one notable glaciation, that of the Permo-Carboniferous [preceding the time of the large reptiles], was due to a displacement of the pole from its present position, it becomes worthwhile to inquire whether the quaternary [recent] glaciation would not have a similar cause."<sup>1099</sup>

This book is yet another attempt to analyze, test, and present the geophysical and biological evidence as it is related to a poleshift catastrophe in historical times. The reason that this idea has not been tested is testament to the stranglehold uniformitarianism has had on the mind of science over the past century and a half. This book opens with an historically significant citation that the evidence of the Earth spoke eloquently of great recent catastrophes. Charles Lyell looking at the catastrophic thought of that time, chose to damn it and all such concepts to the unspeakable realm of pseudoscience and fantasy.

And I emphasize that Lyell set out directly to destroy the view of catastrophism from the very beginning. According to Henshaw Ward:

"What Lyell was plotting when he wrote his book [*Principles of Geology*] he revealed to his sister in [a letter dated] January, 1829: 'Longman has paid . . . for a popular work on geology just coming out. It is to prove the Hebrew cosmology . . . to be burnt . . . so much the better. I have a rod [to beat] . . . the [catastrophist] fanatics, from a quarter where they expect it not.

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<sup>1097</sup>Stephen Jay Gould, "Toward the Vindication of Punctual Change," *Catastrophes and Earth History*, (Princeton, N.J., 1984), pp. 15-16.

<sup>1098</sup>I. Velikovsky, *Earth in Upheaval*, *op. cit.*, p. 126.

<sup>1099</sup>*Ibid.*

*The Pope instituted lectures on the Mosaic cosmogony to set free astronomy and geology. . . .*<sup>1100</sup>

To accomplish this task Lyell, a lawyer, used every method of persuasion and argument at his disposal. And in the short-term he was successful. But presently it is becoming clear that what he did was of great harm to scientific thought.

Martin Rudwick and others now castigate the blinders Lyell placed upon the scientific mind.

"In the *Principles of Geology*, Lyell used all the tricks of the barrister's trade, to make easy mincemeat of his scientific opponents. He described the theories of the catastrophists in a way that made them sound deeply unscientific. 'We hear of sudden and violent revolution of the globe,' he thundered.

'. . . of the instantaneous elevation of mountain chains, of paroxysms of volcanic energy . . . We are also told of general catastrophes and a succession of deluges, of the alteration of periods of repose and disorder, of the refrigeration of the globe, of the sudden annihilation of whole races of animals and plants, and other hypotheses, in which we see the ancient spirit of speculation revived, and a desire manifested to cut, rather than patiently to untie the Gordian knot.'<sup>1101</sup>

Rather than untying the Gordian knot, Lyell's uniformitarianism has forced so many phenomena and pieces of evidence to be twisted out of shape and meshed together that his philosophy has tied the hands of all serious thinkers from even attempting to unravel the evidence that so clearly pointed to recent cataclysms. But it has done even greater damage than that by stifling investigations along these lines; it has blinded those who, looking at the clear evidence of catastrophism, as Darwin did in South America, could see nothing but the doctrine he had imbibed at the feet of Lyell. As an instrument of established science, uniformity has been responsible for long abuse not only of the way evidence has been handled, but for the abuse of workers in these areas of study who transgressed the dogma that Lyell established.

Richard Huggett well understood the depth of hostility toward catastrophism that Lyell engendered by his assault.

". . . Hooykaas . . . explains, the history of geology has often been expounded, in the fashion of a fairy tale, as a battle between good and evil:

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<sup>1100</sup>Henshaw Ward, *Charles Darwin and the Theory of Evolution*, (New York, 1943), p. 69.

<sup>1101</sup>Martin Rudwick, "Darwin and Catastrophism," *Understanding Catastrophe*, Janine Bourriau ed., (Cambridge, Eng., 1992), p. 69.

catastrophism is black; uniformitarianism is white. This view looks right over the very important points made by the old catastrophists, some of which, such as their explanations for the occurrence of quick-frozen mammoths in Arctic regions, even Lyell and Darwin found themselves at a loss to counter arguing [not from evidence but] from uniformitarian principles [just as is done today]. It is very narrow-minded . . . to claim that uniformitarian geology is good, catastrophist geology is bad, that hypotheses couched within uniformitarian terms are productive, whereas those couched in catastrophic terms are empty."<sup>1102</sup>

In the end, I think Cuvier and Velikovsky will be ultimately vindicated. Cuvier also believed the mammoth had been destroyed by the last cataclysm.

"These repeated eruptions and retreats of the sea have neither been slow nor gradual; most of the catastrophes which have occasioned them have been sudden; and this is easily proved, especially with regard to the last of them, the traces of which are most conspicuous. In the northern regions it has left the carcasses of some large quadrupeds which the ice had arrested and which are preserved even to the present day with their skin, their hair, and their flesh. If they had not been frozen as soon as killed, they must quickly have been decomposed by putrefaction. But this eternal frost could not have taken possession of the regions which these animals inhabited except by the same cause which destroyed them this cause, therefore, must have been as sudden as its effect."<sup>1103</sup>

In order to comprehend the vast implications of Velikovsky's planetary catastrophic theory not a revision but a poleshift in scientific thought is required. This concept is well described by historian of science, Alexander Koyre:

". . . what the founders of modern science among them Galileo had to do was not to criticize and to combat certain faulty theories, and to correct or to replace them by better ones. They had to destroy one world and to replace it by another. They had to reshape the framework of our intellect itself, to restate and to reform its concepts, to evolve a new approach to Being, a new concept of knowledge, a new concept of science—and even to replace a pretty natural approach, that of common sense by another which is not natural at all."<sup>1104</sup>

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<sup>1102</sup>Richard Huggett, *Catastrophism Systems of Earth History*, (London, 1990), p. 20.

<sup>1103</sup>Cuvier, *Essay on the Theory of the Earth*, in Albritton, *Catastrophic Episodes in Earth History*, (New York, 1989), p. 37.

<sup>1104</sup>Alexander Koyre, "Galileo and Plato," *Roots of Scientific Thought*, Phillip Weiner, Aaron Noland eds., (New York 1957), p. 152.

This is the daunting task that Velikovsky and those of us who support his approach and methods must face.

The idea of recent cosmic catastrophes seems to have arrived at long last. The evidence of Comet Shoemaker-Levy's impacts on Jupiter is stunning evidence that has catapulted the concept upon the consciousness of modern science. It may happen that in a few years hence there will arise a new major scientific debate between astronomers and geologists on one side against paleontologists, archeologists, and historians on the other quite similar to the debate fueled by the layer of iridium found at the KT boundary. Some astronomers now present the concept that the Ice Age and the extinction of the megafauna came about as the result of cosmic catastrophes, and that the ancient world's myths give corroborating support for this thesis, as well as evidence of other cosmic upheavals and conflagrations. The evidence that may come out of such a debate would be invaluable to those of us who have been investigating these concepts for some years. Of course, Velikovsky will probably still be shunned while his thesis is presented in other garbs. Velikovsky's numerous critics and others who will deny to their dying day the value of mythic evidence will be turning over in their graves if such a major debate over these events unfolds. But that is just what is beginning to happen.

Velikovsky's scientific revolution may take centuries to accomplish or it may simply fail to play any role whatsoever in the future of scientific discourse. As Jean Piaget, the great experimental psychologist understood,

"In the field of thinking, the whole history of science from geocentricism to the Copernican revolution, from false absolutes of Aristotle's physics to the relativity of Galileo's principle of inertia, and to Einstein's theory of relativity, shows that it has taken centuries to liberate us from systematic errors, from illusions caused by the immediate point of view as opposed to 'decentered' systematic thinking."<sup>1105</sup>

Philosopher of science Paul Feyerabend explicitly shows that Velikovsky's revolutionary concepts are really no different from an historical-philosophical point of view than that of Copernicus.

". . . the experts declared the doctrine [of the motion of the Earth that Galileo upheld] to be 'foolish and absurd in philosophy' or, to use the modern term, they declared it to be unscientific. This judgment was made without reference to the faith, or to church doctrine, but was based exclusively on the scientific situation of the time. It was shared by many outstanding scientists. Tycho Brahe having been one of them. . . . Compared with those facts, theories, and standards, the idea of the motion of the earth was absurd as were

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<sup>1105</sup>Jean Piaget, "Comments," [on L. S. Vygotsky's *Thought and Language*, (1962)], (Cambridge, Mass., 1962), p. 3.

Velikovsky's ideas when compared with the facts, theories, and standards of the fifties. A modern scientist . . . cannot cling to his own strict standard [of evidence] and at the same time praise Galileo for defending Copernicus."<sup>1106</sup>

The fundamental arguments raised against Velikovsky's catastrophic theory from the very beginning have always been based on the conceptual systems of the scientists that excluded global poleshifts in recent times. Digby J. McLaren, with respect to the concept of how theory blinds researchers, explains this as he discusses the way catastrophism has been denied.

"The forces ranged against [catastrophic] empiricism in the earth sciences are formidable. We tend to doubt the evidence of our senses unless it agrees with our ideas of how things work. . . .

"But hypotheses or their models are also dangerous, because it is abundantly clear that we have a tendency to fall in love with them, like all true lovers, we become blind to their faults and blemishes. . . .

"Many of the models used to attack the empiricists were so strongly entrenched that they had, in fact, already been assumed as principles, and thus formed the unquestioned base for deductive conclusions."<sup>1107</sup>

It is against this strongly entrenched set of "assumed uniformitarian principles" that is the basis of present-day scientific thought that must be overcome before serious and thoughtful consideration of Velikovskian catastrophism will ever be able to find its place in future science. As Piaget understood, the "illusions caused by the immediate point of view" are not given up easily, but only over long periods of time.

The Velikovsky revolution may take centuries to find a place within the body of science, or it may be completely ignored, in spite of the enormous collection of evidence presented in this book and others and journals elsewhere that appear to conform with and support his hypothesis extremely well. Nevertheless, Velikovskian catastrophism has come a very long way. It may still require a long protracted struggle for it to make its way, if ever, toward scientific acceptance. New generations of thinkers and scientists unfettered by the scientific dogmas of the present time may one day see the evidence that continues to accumulate in Velikovsky's favor with new eyes. It is perhaps to that generation one may hope for a just decision regarding these ideas and this evidence. The present generation cannot admit it may be deeply mistaken and that its behavior toward Velikovsky is no different than the generation that rejected Copernicus, Galileo, and Kepler, whether or not Velikovsky is right or wrong.

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<sup>1106</sup>Paul Feyerabend, *Against Method*, rev. ed. (London, 1988), pp. 132-133.

<sup>1107</sup>Digby J. McLaren, "Impacts and Extinctions: Science or Dogma?" *The Mass-Extinction Debate*, Williams Glenn, ed., (Stanford, Calif., 1994), pp. 121-122.

Cyrus H. Gordon discusses the nature of revolutionary scientific concepts, which I believe well summarizes the psychological and sociological stance that nearly all modern academics and scientists take with respect to the theory of Velikovsky which this book supports:

"If I have learned anything throughout nearly half a century of study, it is to keep an open mind and to avoid confusing majority opinion with truth. Many seemingly preposterous myths have turned out to be correct. While savants 'with both feet on the grounds' were agreed that Troy was a fiction of Homer's poetic fancy, Schlieman, with the childish faith of an amateur, unearthed it. Notable breakthroughs often require the kind of thinking that 'sound' people (i.e., who have the weight of consensus behind them) will brand as 'unscientific' or plain 'crazy.' . . .)

"The solid citizen of academia would not think of expressing a great thought, even if one should perchance cross his mind, for 'sensible' men who have achieved position and the emoluments of their profession are not tempted to jeopardize their reputations and security as crusaders in the cause of truth."<sup>1108</sup>

I believe that this psychological and sociological insight epitomizes the dilemma of having the concepts presented in this book being properly evaluated and that the same highly charged, highly emotional reaction by the establishment to Velikovsky's earlier research will be the response to this book, as well. Or it may be completely ignored and thus denied.

The forces of scientific orthodoxy are not small impediments to be overcome. Sociologist of science William Glen, when interviewing Stephen Jay Gould of Harvard University, posed the problem of orthodox thought and then Gould responded:

"Glen: To what extent do the institutions of science support orthodoxy or prevailing views by such devices as discouraging published dissemination of radically new ideas, especially by control of the editorial and referring processes, or by control of research through refereeing grant proposals, such as to exclude research that seeks to undermine rather than further articulate the discipline's paradigm(s)?"

"Gould: I think orthodoxy is enormously supported. In fact, I would make an argument—and I think that anyone who argues against this is not being quite honest—that institutions, universities in particular, are very conservative places. Their function is not—despite lip service—to generate radically new ideas. There's just too much operating in tenure systems and granting systems, in judgmental systems—usually older upon younger people [with] pretenure needs to conform. . . . I think more of the conformity comes from what you get grant money for, and from what universities press you do. But think about how many

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<sup>1108</sup>Cyrus H. Gordon, *Before Columbus*, *op. cit.*, p. 79.

really great thinkers from Darwin back and forward—Einstein for that matter—did their work outside of universities."<sup>1109</sup>

On the basis of these remarks, Velikovskian research has been freer because its researchers often do not depend on the Establishment to conduct work or publish. But on the basis of these remarks, this book will not and cannot be acknowledged as valid by the Establishment of the present day. Joseph Lister, who introduced antiseptic surgery, remarked on the difficulty of having new theoretical concepts honestly evaluated by establishment scientists:

"I remember at an early period of my own life showing to a man of high reputation as a teacher some matters which I happened to have observed. And I was very much struck and grieved to find that while all the facts lay equally clear before him, only those which squared with his previous theories seemed to affect his organs of vision."<sup>1110</sup>

There is, I contend, little difference between political bureaucratic warfare and that of scientific warfare. The difference is only of degree and of methods employed to maintain the *status quo*. Nicolo Machiavelli, in *Il Principe*, (1513), understood:

"There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success than to take the lead in the introduction of a new order of things, because the innovator has for enemies all those who have done well under the old condition, and lukewarm defenders in those who may do well under the new."<sup>1111</sup>

Nevertheless, with respect to Velikovsky, one wonders if there may not come a time when Establishment Science will find itself in the same position as the Church, with regard to Galileo, and be forced to the admission that it was blind to reason and evidence and have to apologize to the world for its actions against this heroic man. I do not know if such a state of affairs will ever come about. I hope it will. Only time will tell.

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<sup>1109</sup>"On the Mass-Extinction Debate: An Interview with Stephen Jay Gould," conducted and compiled by William Glenn, *The Mass-Extinction Debate*, William Glenn, ed., (Stanford, Calif., 1994), pp. 260-261.

<sup>1110</sup>Robert Youngson, *Scientific Blunders*, (New York, 1998), p. 163.

<sup>1111</sup>William Glenn, "How Science Works in the Debates," *The Mass-Extinction Debate*, (Stanford, Calif., 1994), p. 80.

Kenneth Hsü, who called Velikovsky's books "good science fiction" in his own book, *The Great Dying*, page 281, cites the *Bible*, "Ecclesiastes," 9:11 as support for catastrophism.

"I returned and saw under the sun that the race is not to the swift, nor the battle to the strong, neither yet bread to the wise, nor yet riches to men of understanding, nor yet favor to men of skill; but time and chance happeneth to them all."

With respect to Hsü's own conversion from uniformitarianism to catastrophism, he nevertheless writes:

"Blind faith in the dogma lies at the root of numerous controversies in modern geology. After years of tutoring by [Edmund] Spieker I, too, became a died-in-the-wool uniformitarian. I also tended to confuse ignorance with objectivity. I thought I was being objective when I indulged in simplistic speculations. . . . I was jolted out of my complacency, however, when I had to write a cruise report on the 1970 deep-sea drilling expedition to the Mediterranean Sea. That this inland sea had dried up during Late Miocene time was the only conclusion that is consistent with the implications of a wealth of data on Mediterranean geology. . . . The reactions of my colleagues were, however, negative. They said either 'I don't believe your story,' or 'You are way off base, because your conclusion contradicts Lyell's uniformitarianism, the fundamental principle of geology.

"To believe or not to believe is irrelevant; faith is a question of religion, not of science."<sup>1112</sup>

Hsü ends his paper with this ringing denunciation of uniformity thus: "Substantive uniformitarianism is the epitome of ignorance and arrogance of nineteenth-century scientists."<sup>1113</sup>

In the same regard, Hsü's arrogant dismissal of Velikovsky's hypothesis is also built on certain assumptions which is a form of faith that the recent history of the Earth did not experience global catastrophes. While Hsü lauds Georges Cuvier for suggesting catastrophes occurred during the recent history of the Earth,<sup>1114</sup> a certain blindness

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<sup>1112</sup>Kenneth Hsu, "Uniformitarianism vs. Catastrophism in the Extinction Debate," *The Mass Extinction Debate*, W. Glenn, ed., (Stanford, Calif., 1994), p. 218.

<sup>1113</sup>*Ibid.*, p. 228.

<sup>1114</sup>*Ibid.*, p. 219.

disconnects these recent catastrophes with those presented by Velikovsky. Cuvier is to be rehabilitated within the new catastrophist camp, but Velikovsky is to be relegated to the dark regions of non-identity.

Respecting how the Establishment has dealt with Velikovsky, I too, cite 'Ecclesiastes,' 13:16.

"I have also seen this example of wisdom under the sun, and it seemed great to me. There was a little city with few men in it; and a great king came against it and besieged it. But there was found in it a poor wise man, and he by his wisdom delivered the city. Yet no one remembered that poor man. But I say wisdom is better than might, though the poor man's wisdom is despised, and his words are not heeded."

Thus I end this book as does Huggett, the modern historian of geology, with an insight from one of the greatest painters of this century, Russian artist, Wassily Kandinsky:

"Here and there are people with eyes which can see, minds which can correlate. They say to themselves: 'If the science of the day before yesterday is rejected by the people of yesterday, and that of yesterday by us today, is it not possible that what we call science now will be rejected by the men [and women] of tomorrow? And the bravest of them answer. It is possible.'

"Then people appear who can distinguish those problems that the science of today has not yet explained. And they ask themselves: 'Will science, if it continues on the road it has followed for so long, ever attain the solution to these problems? And if it does so, will men [and women] be able to rely on its solution? In these segments are also professional men [and women] of learning who can remember the time when facts now recognized by the Academies as firmly established, were scorned by those same Academies.'<sup>1115</sup>

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<sup>1115</sup>Huggett, *Catastrophism Systems of Earth History*, *op. cit.*, p. 200.