Environmental Determinism: Broken Paradigm or Viable Perspective?

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Environmental Determinism: Broken Paradigm or Viable Perspective?

A dissertation presented to
The faculty of the Department of Educational Leadership and Policy Analysis
East Tennessee State University

In partial fulfillment
Of the requirements for the degree
Doctor of Education in Educational Leadership and Policy Analysis

by
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August 2009

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Keywords: Environment, Determinism, Possibilism
ABSTRACT

Environmental Determinism: Broken Paradigm or Viable Perspective?

by

Gerald L. Hardin

The research was to examine the issue of environmental determinism. It was an ideology that was prevalent throughout the early decades of the 20th century that held that the natural environment was responsible for virtually all human development. It helped bring the study of geography into the venue of postsecondary education, where it was viewed as a tool for study of human activities. It was a new science inspired by Darwinism that viewed human adaptation to the natural environment as critical to socialization.

Relying on historical sources, the purpose of the study was to reveal how environmental determinism became a controversial extension of an ancient belief system. It played a role in religious thought, philosophy, and the rise of the social sciences. It likely dates back to the Neolithic epoch in which cultures explained the mysteries of the natural world in terms of fearsome anthropomorphisized elements. Today, the gods and goddesses have fallen by the wayside, while environmental determinism has not.

Eventually, the ideology lost its major supporter and then became a topic of disapproval. However, it was never entirely disproven, but it did fall from grace. And, it is a belief that has persisted for centuries. It was central to Calvinism and some versions of Protestantism that were relocated to North America where it took root. In view of the evidence, it is proposed that
environmental determinism be reopened for reassessment and debate. It is manifest that future
generations be apprised of the potential problems that it may inspire. To paraphrase Ellen
Churchill Semple, the study of humans without consideration of the earth, would be like studying
cactus without consideration of the desert.
DEDICATION

Dr. Robert Peplies imbued his students with an appreciation of the geographic perspective – to see beyond the obvious, to discern underlying factors, and to piece together meaningful connections that make up the panorama of reality. He pointed out the patterns elements of material culture consisting of built-up areas, deteriorated areas, commercial strips, business districts, residential areas, vacant areas, recreational areas, and so on. Considering the world from a geographical perspective Peplies pointed out how cultural, economic, and political elements are reflected in spatial arrangements upon the landscape. Further, he challenged his protégés to discern spatial patterns that exist at virtually every scale of human operation from the most minute to immense levels. During the scores of expeditions that “Dr. Bob” led during his tenure at East Tennessee State University he revealed the less-known world and expanded the thinking of generations of students. It is to him that this project is dedicated.
ACKNOWLEDGMENTS

Teachers, mentors, friends, and family have all played a role in this study. It is impossible to adequately credit any one individual because so many provided so much. Every individual played a role that was unique, timely, and reflective of his or her character and wisdom.

A “thank you” alone, seems inadequate to convey the gratitude owed to Dr. Terry Tollefson, who went far beyond the requirements of committee chair giving counsel, guidance, encouragement, and more assistance than anyone could ever ask of another. Because of his endless patience and unyielding support the light at the end of the tunnel became attainable.

No recognition could be more deserved than that of Dr. Robert Peplies, Emeritus professor of geography at East Tennessee State University. He was a mentor and friend who introduced new ways to see the world as a whole of interconnected elements. Through a decade of lectures, discussions, and explorations in the field he enlivened the study of geography with his insight and humor. And, his peripatetic teachings shall be remembered among the most joyful learning opportunities ever experienced by this grateful student.

Dr. Glen Bettis and Dr. Louise MacKay, who patiently contended with a plethora of manuscripts that progressed by fits and starts, are owed my sincerest appreciation for their input that helped direct and tune the focus of the study.

My wife Teresa, who struggled and stressed tirelessly at my side; and, who inspired and provoked me toward completion, deserves an honorary degree to go with my love and deepest appreciation.
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Broadly speaking, environmental determinism was at the center of one of the longest debates in the history of the social science of geography (Beck, 1985). Yet, in spite of years of debate over the issue, there has yet to be any clearly defined disposition of the matter. Rather, it was an idea that stirred considerable debate in the emerging field of human geography, eventually dispatched by the majority that felt it unworthy of further discourse. In spite of that ruling, the theory has reemerged periodically to haunt scholars and the public alike. The fact that it continues to be revived among various writers, scholars, and others is cause for consideration.

**Toward a Definition of Environmental Determinism**

The simple definition of environmental determinism is that the natural environment is responsible for all human actions. However straight-forward that may appear was clouded by decades of critical review and debate. Among the issues that have skewed the definition is the fact that some major voices in the movement contended that idea was only proposed as another tool for geographers and not a universal concept as its critics seemed to assert. Then there were shades of meaning surrounding both environment and determinism with some in both camps declaring in favor of either broadening the definition or taking a narrow view. Additionally, the underlying beliefs from which the concept appears to have developed extend far into the dim past of human history that lends weight and a sense of legitimacy with threads connecting to ancient cultures as evidenced by relevant literature from long ago.

As a scientific theory, environmental determinism was founded in the latter 19th Century
by the German geography professor, Friedrich Ratzel. He was in turn greatly influenced by Herbert Spencer’s perspective on Charles Darwin’s theory of natural selection that provided a corollary to the role of breeders who selected specific genetic traits to produce different species of domestic animals. Soon, other geographers picked up the idea that seemed to promise a positivistic approach to the study of human geography in relationship to habitable space. Among those who led the American determinist movement were Ellsworth Huntington, William Morris Davis, Griffith Taylor, and most notably, Ellen Churchill Semple. Together, they contributed to the growth and spread of the ideology that hit at the heart of human geography in which the relationship between humans and the earth led geography into the curriculums of higher education across the country.

Early on, two perspectives gained precedence known as *environmentalism* and geographical determinism. These contributed to a widening interest in theoretical constructs that were thought could provide the means for scientific measurement of factors and strength of the relevant social impact (Hartshorne, 1966). While the challenges to actually develop such measurements proved daunting, American geography was boosted by an influx of scholars who sought to identify discreet features in human behaviors that could be tied to elements found in the natural world. Intriguing leads were presented in the geographic journals, sometimes exceeding credulity, but significantly hopeful in their suggestion that the social sciences may well study human behavior in terms of mechanistic relationships. Such cause and effect associations would have put human geography on par with the physical sciences in which determinism was axiomatic. Over time, efforts to link humans and environments attracted considerable criticism as contrary examples began to emerge. Nonetheless, environmental determinism played a role in making American geography an analytical science instead of that of
a descriptive gazetteer. The major contrary positions that opposed the deterministic perspective included *possibilism* and *probabilism* which also contributed the way geography is studied today as an analytical discipline because:

These two positions were not consistent extensions of the metaphysical concepts of free will and determinism…possibilism denied environmental control but not necessarily other determinants…But, since environmentalists never completely excluded cultural factors, they differed from possibilists and especially probabilists only in degree. Nor has any challenge to determinism eliminated deterministic systems…Alleging, that antithetical constructs may play complementary roles in objective geographical analysis (Lewthwaite, 1966, p.1).

In the early 20th Century, support for environmentalism and determinism was widespread but by relying on largely deductive methods scholars like Semple made the all too common error of failing to seek examples that were at odds to the theory. Instead, she tended to choose examples that supported her theory. Still, Semple never suggested that the physical environment alone was the origin of all human activities and avoided using the term “control” when ascribing human activities to environmental causes. Semple was careful to say that only under certain circumstances there was a tendency for people to behave in predictable ways – which is a verbal approach to probability theory” (as cited in James & Martin, 1981, p. 306). In *Influences of Geographic Environment*, Semple reported that:

Man can no more be scientifically studied apart from the ground which he tills, or the lands over which he travels, or the seas over which he trades, than polar bear or desert cactus can be understood apart from its habitat. Man’s relations to his environment are infinitely more numerous and complex than those of the most highly organized plant or animal. So complex are they that they constitute a legitimate and necessary object of special study…[However], man has been so noisy about the way he has conquered nature’ and Nature has been so silent in her persistent influence over man, that the geographic factor in the equation of human development has been overlooked. (Semple, 1911, p. 204)

The concept of environmental determinism begins with by conceptualizing the term
environment, which means in its broadest sense: the sum of one’s surroundings; the whole of all circumstances included in those environs and may include different shades of meaning depending upon the cultural understandings. According to a review of several dictionary definitions, the environment may also include both the natural panorama as well as the human built-up surroundings. Depending upon reference, geoscience may include ecosystems, biomes, landscapes of both known and unknown places, as well as any array of human activities that characterize such places. Terms like, “determinism,” “deterministic,” and “determine” all imply cause-effect relationships that are essential for positivistic analysis. Regardless of how these terms may be combined, the result fails to adequately clarify the confusion and misguided applications that have occasioned environmental determinism.

**Significance of the Study**

Defining the concept is perhaps the first significant issue that arises when attempting to analyze environmental determinism. While there is a fairly straight forward definition, it seems to lose something in translation, depending upon who did the defining, and for what purpose. Over time it has been defined and redefined by virtually every scholar in the geoscience disciplines since it was introduced in the United States at the turn of the 20th century. Still, it was a rather ambiguous concept that a variety of scholars attempted to make fit into one or another substantive structure as befit their needs or wants. Now, more than a century later, the world is still grappling with issues relevant to environmental determinism that can be either positive or problematic as the case may be.

In 1966 the Annals of the Association of American Geographers reported comments by Lewthwaite that:
Few among us have failed to sympathize with the not uncommon plea that geographers break off this fruitless debate and move on to fresher themes. Yet the debate seems irrepressible: even were geographers to ban the issue, it will continue to break surface throughout the whole range of the social sciences (Lewthwaite, 1966, p. 1).

Geographer, G. F. Carter, commented on environmentalism, an intellectual movement that represented a somewhat reactionary perspective that differed from the popular movement that marked the latter years of the century.

Although geographers have now turned from environmentalism to a more balanced view, allied fields of knowledge are all too often still following along in the deterministic paths marked out fifty years ago. When history, economics, and political science, even on the college level, refer to geographic factors, all too often they take a strongly physical environmental determinist view. In lower-level schools, one seldom meets anything but determinism (Carter, 1964, p. 2).

―Environmental determinism…was a major and influential theme in American geographical thought in the early twentieth century” (Beck, 1985, p. 7) that much is certain and many in the budding field of human geography considered it to be an authoritative way to explain cultural traits as reflections of adaptation to the natural environment (Beck, 1985). It was believed that it could provide a theoretical tool to analyze human behaviors relative to inhabited landscapes and within a few years of its introduction, it became the dominant school of thought in the budding field of geography. It also gained critics along the way who argued against its constraints and its teleological implications. Further, the idea that nature alone was ultimately responsible for the bulk of cultural adaptations was seen as too encompassing to be verifiable, and at odds with beliefs that “as cultures advance so do their control over the physical environment.” (Beck, p. 37)

Eventually, environmental determinism was disavowed by most geographers and scholarly debate in the academic journals largely came to an end. However, within the public arena the idea persisted and reappeared from time to time both in the lay literature and imbedded
in scholarly works under various headings. Generally, it no longer appears under its own label, instead surfaces under alternate guises. However, when it does emerge, it is typically as an adjunct to some less than legitimate research, or as a corollary to Calvinism or other fundamentalist religious beliefs, or even occasionally in blatant support of bigoted and racists ideologies.

The significance of this study is that by shedding light on this problematic concept – not only its nefarious side, but as well its positive attributes, educators should be made aware of this concept and the school of thought that promoted it. It was spread throughout the United States over a period of many years, which contributed to its widespread acceptance and application. Attempts that have been made to eliminate it, squash it, or simply drop the matter from further discussion have failed. Therefore, environmental determinism is begging renewed critical attention, or perhaps a new or different approach to its employment. In the end, awareness and understanding of the concept and its potential dangers may be the only reasonable way to deal with the dark side of environmental determinism.

**Statement of the Problem**

More than a century after its introduction, the term *environmental determinism* virtually disappeared from usage. However, the underlying ideology did not disappear; instead, the idea that natural causes were the genesis of human behavior periodically emerged in both popular literature and scholarly publications. The cause was scientific in nature: to establish that cause and effect relationships existed between various social phenomena and the natural world. Further, the fact that there was considerable evidence to support such arguments was a powerful impetus to keep picking the topic up for further study.
Although there were plenty of examples supporting environmental determinism, there were also examples to the contrary as well. Possibly the most negative indictment against environmental determinism was its perceived association with unsavory cultural expressions of xenophobia. In its extreme, there were aspects of chauvinism, prejudice, racism, bigotry, hypocrisy, and uncompromising fundamentalism, to name a few ideations that were twisted together into mere approximations of scientific ideas. These ideas fit the sordid agendas of a few, to whom, environmental determinism provided a pseudo intellectual approach to classifying people according to their environmental origins. Thus, a culture might be characterized as having impoverished or inferior intellectual capabilities because of the marginal landscape and the grueling climate associated with its origins.

Misappropriating science for unsavory uses has a sordid past. For example, social forces have applied a host of innocuous labels to less than savory social issues. Euphemisms such as Social Darwinism, Eugenics, Ethnic Cleansing, and Phrenology, to some degree, have all been misappropriated wildly divergent personal agendas that at times have confused the public as to what constitutes good science. Pseudo-sciences like Social Darwinism, spurious practices like the Eugenics Movement, and homicidal Ethnic Cleansing like the Holocaust all presumably found some support for their unethical or pathological beliefs in the theory that the environment is solely responsible for the whole of human development. As a result of those associations, environmental determinism gained notoriety as a less than beneficial scientific perspective. The result was that one by one, scholars turned their collective back on further discussion of the matter of environmental determinism.

Efforts to eliminate the label *environmental determinism* have been more successful than eliminating the underlying beliefs. Subsequently, the term is rarely used any more, yet ideas and
beliefs that humans are products of their environments persist. In fact, such beliefs run very deep and must be acknowledged or risk magnifying its power by attempting to keep it repressed. For example, Taylor defended environmental determinism in 1923 when he was quoted in the Geographic Review as saying that:

I still hold that the health…of the white race is, and will be, much more controlled by climatic factors than by individual, family and social action.’…Hence I think myself that [the critic] does not yet fully appreciate the importance of the physical environment, whereas I see no reason to doubt that it will continue to be the chief agent in determining the habitats of the human race (Taylor, 1923, p. 375).

Standard history books typically note that many Europeans fully expected Christopher Columbus to sail off the edge of what was believed to be a very flat earth. An even more widely held belief was that the earth was the center of the universe. The flat-earth and geocentric beliefs were derived from empirical and logical evidence. However, though they were axiomatic certainties, those two firmly-rooted principles were unable to withstand rigorous scientific testing that emerged in the 16th and 17th centuries. Today, geography textbooks give no serious attention to the flat-earth and geocentric beliefs that once dominated the group-think consciousness.

Environmental determinism was a belief that dominated the American geographic community during the first half of the 20th century. For many reasons that will be described in some detail it was eventually dropped from scholarly discussion. However, unlike a host of failed theories and pseudo-sciences that have been sprinkled throughout the historical annals, environmental determinism continues to garner considerable description in college-level geographic texts. Unfortunately, those texts generally give few details on the ideological debates that have characterized determinist theories and philosophies over the past decades and it continues to percolate through the popular media and likely contributes to social maladies like
bigotry and racism.

These latter issues may actually grow in an environment that has largely suppressed discussion of environmental determinism. Determinism has been associated with teleological viewpoints in which a cosmollogically planned universe may appear to be supported by a scientific theory. Further, such beliefs typically are inherently deeply buried in one's subconscious thinking and could unduly influence a research effort in which beliefs could inadvertently skew or contaminate findings. It is essential that only through education and awareness can such contamination be avoided. Such issues provide the purpose and drive the need to inform the public and scholars alike and thus an essential reason for this study.

**Research Design**

Ideas that are summed up by the concept of environmental determinism are inherently present in society; however, it is contended that few people are consciously aware of their beliefs related to this idea. It is the intent of this study to provide one more piece of information that may contribute to the overall understanding of the concept. Only with awareness can individuals begin to understand their own beliefs. If those beliefs are problematic, then awareness can be a great thing. It is with this in mind that the study was undertaken. That said, the approach is to again define, review, and analyze the subject by tapping into a range of comments that environmental determinism has elicited over the years. While it is unnecessary to consider every comment that has ever been published on the topic, it is important to review a considerable quantity of commentary to reveal the considerable influence the idea has inspired. Essentially, this is a specified sampling of commentary that used some primary sources, but many more secondary sources; therefore, that approach narrowed the review to the heart of the
matter that focused on the negatives, positives, and alternative ideas that emerged in response to environmental determinism. In this effort, it was deemed most important to review some of the most significant commentary espoused by the leading critics, proponents, and those who offered neutral or balanced perspectives that appeared to be relevant to the topic.

**Delimitations of the Study**

This study of environmental determinism is generally a historical review of an idea that stimulated decades of debate among scholars and speculation among the lay community. In addition to a review of the ideology that stirred up a controversy, there is also a concern that personal beliefs related to this issue could taint the best-intended research in which the only reasonable counter-measure is an educated awareness of the dangers. Sometimes, couched in the popular guise of “nature versus nurture” arguments, this topic has in the minds of many people, been relegated to the trash-heap of history. Today, the terminology of environmental determinism has been dropped from scholarly debate essentially because the critics saw no value to the concept and little chance of any acceptable resolution. Subsequently, it is a concept that is both unpopular and seemingly out-of-step with modern academics; therefore, the chances of eliciting any significant discussion among scholars represents an obstacle to efforts to resurrect the issue.

The issue of relevance leads to the second constraining issue – that of why study the topic of environmental determinism in the first place? This concern lies in the contention that the issue was never resolved but has instead submerged beneath a bewildering array of less contentious issues that have contributed to confusion and enlarged the dangers associated with environmental determinism. Sorting through these issues was and likely would continue to be problematic for
the uninformed researcher who might be unaware of some of their own deep-seated beliefs. Understanding of the issue is both an impediment and a danger to objective research.

The third obstacle to this research was failing to determine any reasonable or constructive parametric method that could have proven some relevant degrees of impact of environmental determinism. In fact, following considerable discussion and review of available information, no reasonable parametric strategy was deemed applicable. Therefore, the study was confined to a qualitative review of the relevant issues involving environmental determinism with the goal of expanding public and academic awareness of how the misapplication of ideas can at times stir people to bad behavior. As such, this study evolved into an extended review of literature as a way of detailing the relevant issues necessary to expand understanding and awareness. The task required that choices be made from among an enormous number of sources in order to find those representing the inherent development of a belief system and how it found its way into academic disciplines and perspective. Principally, secondary sources were determined to be the most cogent as they provided more directed commentary related to the topic. However, there was some concern that reliance of secondary sources could be problematic for some because of the perception among some scholars that primary sources offer the most legitimate information. However, in this case, the opposite view was deemed necessary with the understanding that secondary sources may be viewed by some as a delimiting factor.

The term environmental determinism has a relatively brief history of a bit more than a century. However, on closer inspection it became apparent that there were some long-held, deeply imbedded, culturally-relevant myths, beliefs, and ideologies that contributed to the emergence of environmental determinism as an academic school of thought. Further, that school of thought was associated with the emerging field of human geography that helped it gain
acceptance into the curriculums of higher education. The contention is that by investigating the deeply entrenched ideas provide a way of explaining the social-psychological attachments to place and environment may be so deep as to be inherently instinctual. This is just one example of what a powerful element the environment is in the lives of humans. Historically, territoriality can be said to have caused feuds, bloodshed, and even wars in the defense of an innate belief in that the environment underlies the sense of belonging that is common to most cultures. This study then necessarily recognizes and is limited by the assumption that the environment is an elementary part of the human condition.

Another issue is a matter of the literature reviewed for the study. Some sources were translations of ancient texts and much of the remainder was the product of commentary on the topic. The secondary materials used were considered more important than primary sources because the commentary either went directly to the heart of the matter or was deemed necessary to the understanding of the pertinent issues. The primary sources that were employed were principally from ancient writers who helped to establish the beliefs and ideologies that contributed to the role of nature in human and cultural development.

Further, it was recognized that Western Civilization inherited a massive legacy from early civilizations in Mesopotamia, the Near East, Greece, and Rome, hence sources were chosen that represented those places and times were deemed necessary to establish ideological their precedence. Meanwhile, more recent sources were drawn upon for their commentary and reviews of the writings of Alexander von Humboldt, Charles Darwin, Friedrich Ratzel, Ellen Churchill Semple, Carl Sauer, and others. The principal primary sources included those of Richard Hartshorne, Louis Mumford, Joanna Beck, Jared Diamond, David Keys, and Brian Fagan. Additionally, a mix of other materials, including popular journals and periodicals, as well as
interviews, videos, and televised media were used to demonstrate the depth and breadth of environmental determinism. The variety of source materials also help establish that environmental determinism was much more that a minor theory, and further, that it has a long history that appears in a variety of guises, times, and places.

Finally, a degree of bias was purposely introduced into the study simply because a central issue was whether or not environmental determinism was a defunct school of thought. It would make no sense whatsoever to research and write about an idea that was defunct and therefore of no practical value except as an historical footnote. As such, it would make as much sense to conduct a serious study of continuing importance of the belief that the earth is flat. However, the contention is that environmental determinism is relevant to contemporary geography; and, that beliefs and understandings that defined the theory are widespread and manifested in a variety of way in modern America. Therefore, without some bias it would be difficult or impossible to convincing establish the major contention(s) of the study. The admission of bias in this study is in itself a delimitating factor that must be considered by the reader who may then proceed with a clear understanding of the purpose, the methodology, and the findings. Notably, the reader may find the value and significance of environmental determinism expanded by virtue of their own experience relevant to the topic. The bias is imbedded in the research questions (Table 1) as well as various portions of the commentary to help establish some enhanced sense of design, purpose, and methodology for the study. Further, the conclusions presented in the final chapter assumes some agreement with the premise that environmental determinism has some validity and, therefore, deserving of continued research. The research questions listed in Table 1 lend structure to the study and establish certain expectations to be achieved by the research.
Table 1

Research Questions

1. What role has the natural environment played in the history of human evolution?
2. How does the natural environment limit or direct human activities?
3. What are natural laws and how do they relate to human behavior?
4. What, if any, human activities are subject to environmental conditions?
5. How and why was environmental determinism restricted to consideration of the relationship between the natural environment and human behavior?
6. How was environmental determinism relevant to determinist perspectives in history, philosophy, religion, etc.?
7. What role did environmental determinism play in the development of geography as a social science?
8. If environmental determinism had any acceptable applications, why was it rejected?

The teaching profession has always been sensitive to ideological movements that periodically sweep through American academic society that are, in turn, conveyed through students into the public sector. The single most important goal of this study was to simply add another voice to those who recognize that only by raising awareness can some issues ever hope to be resolved. Subsequently, it is believed that only through awareness can those issues related to environmental determinism be overcome. The labels and relevant terminology may be changed, but the underlying ideas that the environment has some degree of influence or control over some or all human adaptations to survival on the planet earth remain. Subsequently, the research questions provide some degree of focus for the study while also conveying the goal and
purpose that drove the investigation. Time will tell whether the rationale of expanding awareness of the issues inherent to environmental determinism was achieved.

The effort to expand awareness is by a review of human history relevant to the myths, beliefs, and attitudes that societies and cultures have expressed over the centuries. However, it has only been since the turn of the 20th century that the concept of environmental determinism was specifically identified and for a time gained the distinction of being a scholarly field of study within American geography. More specifically, it was both a theory and a perspective that had an enormous impact in the teaching of geography among educators in higher education where it seemed to corroborate the prevalent beliefs and prejudices of many Americans.

This study was warranted by the truth produced by hindsight. The rejuvenation of segregation proclaimed by the Jim Crow laws coincided with the rise of the sciences that were heralded by Darwin and Germ Theory. One result of Darwin was Darwinism, which was largely the result of Herbert Spencer's interpretation of natural selection as "survival of the fittest" in which there were implied linkages to the theory of environmental causation. It may have been useful to those with scruples to overlook some heinous behaviors in the name of racism by using science to support their agenda. The antecedents to environmental determinism were deemed to be the major focus of the study as a way of revealing the mythical origins and subsequent historical development and to provide a sense of context in which the beliefs gained its breadth and power.

Summary

Chapter 1 contains a general introduction to the idea of environmental determinism and offered some sense of the breadth of influence it exercised in the United States for more than a
century. Further, even though the ideology eventually lost support among mainstream geographers, it has shown a remarkable persistence through periodic resurrections either wholly or in remixed theoretical constructs that accomplish the same purpose as environmental determinism. Chapter 2 provides a historical review of the environmental determinism beginning with a considerable attention to the underlying concept or belief as expressed by humankind over the centuries. Additionally, Chapter 2 includes examples of the relevant destructive implications associated with environmental determinism in which racism and eugenics were deemed acceptable in certain academic circles based on the belief that inferior environments produce inferior humans. Chapter 3 is an examination of qualitative research specific to historical phenomena. The relevant methodology in the current endeavor consists of an extended review of the literature that supports the premise that environmental determinism has ancient roots in human history. Chapter 4 provides an alternative perspective to environmental determinism – one that was suggested by its proponents. It is a view that attempts to embrace the better side of environmental determinism through description of a number of real-life situations in which the environment plays a decidedly critical role in a variety of cultural adaptations. The scenarios presented are food for thought – is it environmental determinism or not?

It would be too easy to simply go along with the consensus of scholars who turned their collective back on environmental determinism and report on the alternative schools of thought. Instead the natural environment is certainly manifested in certain adaptive human behaviors that are expressed in culturally-significant ways. Chapter 5 addresses some of the major issues and elements of environmental determinism by way of true scenarios employing an expanded perspective on the meaning of environment along with a more lenient understanding of the term determinism. It is unlikely that this effort will rewrite history, but it is anticipated that some
greater understanding of how a movement like environmental determinism could impact society in ways that were likely far removed from that which those who initiated the idea may have expected. While environmental determinism is rarely heard of today, it continues to be manifested in society as beliefs that have ancient origins as well as historical momentum. The concluding remarks are essentially a call to understanding of this idea from a broader perspective than that which was typical of the critics of environmental determinism. It is believed that more good can only come by reopening the debate with the awareness that there are some aspects that can be problematic. If there is any positive aspects of the theory, then it should remain on the table where it can be used when appropriate and the inherent dangers can be understood. This view was drawn from the understanding that repression of ideas serves only to promote ignorance and misunderstanding.

In the history of ideas, like the attempt by the forces of dogmatism to bury the Copernican-Galileo heliocentric idea, there have often been contentious pressures to suppress ideas that were linked to psycho-social conflicts within a cultural milieu. Rather than trying to bury an idea of environmental determinism understanding the terminology is essential. The color and texture of meanings of words becomes critical at times. Taking ownership of the idea of environmental determinism and permitting it to be discussed openly could offer the opportunity to exercise some control over how and where it could be applied. But, as long as it is off limits it can be problematic as it can only be use by those who would twist the idea to support their hidden agendas such as prejudice, bigotry, and racism.

Important ideas generally have a life of their own. Environmental determinism is an example of an evolutionary story of cultural contact, syncretism, assimilation, and transmission of ideas and understandings that over time diffusion by migration, trade contacts, religious
missionary efforts. Ideas were preserved by word of mouth as stories and myths that eventually, and so on. The English language is simply the latest accumulation of words assimilated into a lexicon representing the accretions of traits throughout the millennia. Western Civilization includes many regional variations of dialects that together with shades and textures of meanings that have varied over time as individual words have been transferred into other languages.

A civilization is built upon layers of ideas that have had the creation and preservation of ideas. The culture hearths of Sumeria and Mesopotamia were among the earliest centers of civilizations. Central to that status is recognition of the importance of communication and understanding ideas transferred by writing and meanings which are complicated by textures and shadings of meanings that attend many words. The tools for transmitting ideas – words, may have a range, or shadings, even textures of meaning that have accreted over time. Issues over the meanings of certain words were a significant part of the story of environmental determinism, therefore, a short list of terms considered conceptually relevant to the topic are presented in Table 2. The list is kept small because in many ways, the study is explorations of terms and understandings that have characterized cultural evolution. Although the terms listed are relevant to the study they are also easily misunderstood; and, therein is found an important consideration for the study of environmental determinism.
### Table 2

**Definition of Terms**

<table>
<thead>
<tr>
<th>Terms</th>
<th>Definitions</th>
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<tr>
<td><strong>Axiomatic</strong></td>
<td>Self-evident conclusions arrived at by considering things in their proper context such as elements found in their proper settings just as history considers things in the context of time (Morris, 1981).</td>
</tr>
<tr>
<td><strong>Cultural ecology</strong></td>
<td>The study of human adaptation to and relationships with the natural environment and the study of culture as an adaptive system to environmental change (Jordan-Bychkov, 2006).</td>
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<tr>
<td><strong>The Gaia hypothesis</strong></td>
<td>A perspective in which it is believed that the earth is a large interacting ecosystem in which everything, both organic and inorganic, including the land, the water, and atmosphere, all play a role in which the planet is viewed as a single organism (Jordan-Bychkov, 2006).</td>
</tr>
<tr>
<td><strong>Possibilism</strong></td>
<td>The belief that humans are the active force that drives cultures in which the environment presents a variable range of possibilities for cultural development where choices may be guided by beliefs and experience (Jordan-Bychkov, 2006).</td>
</tr>
<tr>
<td><strong>Probabilism</strong></td>
<td>The mathematical understanding that in the absence of certainty questions about outcomes are best derived from the elimination of least likely outcomes and that the remaining outcome is the most probable answer (James &amp; Martin, 1981).</td>
</tr>
<tr>
<td><strong>Teleology</strong></td>
<td>The study of manifestations of design or purpose in the world, especially in regard to natural processes or occurrences (Morris, 1981).</td>
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CHAPTER 2
HISTORY OF ENVIRONMENTAL DETERMINISM

_Fructo cognoscitur arbor_ (Lat. A tree is known by its fruit)

Introduction

An essential goal of the so-called deterministic or “hard sciences,” is to reveal cause and effect relationships between phenomenon. When such effects have been discovered and when the processes that uncovered the connection could be duplicated, it is said to provide incontrovertible proof that a cause and effect relationship existed. More importantly, the potential to make inference from one set of circumstances to produce a particular outcome the possibility of predicting outcomes accurately suggested that the social sciences could achieve the recognition enjoyed by the physical sciences. This engendered the hope that cause and effect relationships could be established among and between various social phenomena thus raising the stature of the emerging social sciences.

In the era of its inception, environmental determinism was revolutionary. It rejected the dogmatic metaphysical beliefs that dominated Western civilization for more than a thousand years. In hindsight, it appeared that environmental determinism was an attempt to apply a positivistic methodology to the geography of human behavior. (Baumer, 1977). Accordingly,

In a positivist view of the world, science was seen as the way to get at truth, to understand the world well enough so that we might predict and control it. The world and the universe were deterministic—they operated by laws of cause and effect that we could discern if we applied the unique approach of scientific method. Science was largely a mechanistic or mechanical affair. We use deductive reasoning to postulate theories that we can test. The positivist believed in empiricism—the idea that observation and measurement was the core of the scientific endeavor … to discern natural laws through direct manipulation and observation. (Trochim, 2006, p. 1)
To understand environmental determinism and why it became an ideological pariah in human geography, it was imperative to consider its historical context. In 1886, John E. E. Dalberg-Acton (1834-1902), known to history simply as Lord Acton, the founder of the *English Historical Review*, noted that, in order truly to understand history, one had to *grasp ideas* rather than events. According to Baumer (1977),

Ideas have a radiation and development, an ancestry and [a] posterity of their own, in which men play the part of godfathers and godmothers… [And] cultures are the sum total of those developments of the mind … [that] are not the effect but the cause of public events [and are] responsible for commanding, preserving and transmitting ideas for the benefit of posterity. Acton further described ideas as the great impersonal forces which rule the world … that push things toward certain consequences without help from local or temporary or accidental motives. It has been ideas upon which the fate of the world hinges.’ (Baumer, 1977, pp. 2-3)

Lord Acton’s emphatic claim is hard to dispute because ideas have certainly been at the forefront of the action upon which the world swings. Modern Europe spawned determinism in geography prior to the 20th century during a time in which science was becoming wildly popular. At that time, geography was in the sphere of the natural sciences and Europeans were more interested in exploration of the natural world for purposes of colonialism. Medieval Europe was a time and place characterized by ideas of constraint and insularity that was so rigid that when new ideas dared venture into the public sector, they were generally viewed as deviations from the norm and were feared, castigated, or exterminated with great prejudice. The iconic eras in European history including the Renaissance, the Age of Discovery, The Reformation, and the Age of Reason represented periods in which divergent ideas managed to surface, breaking the strict conventions of their time. Positivism and determinism represented the ideological change that made science vastly popular in the mass market of the 18th and 19th centuries (Baumer, 1977, pp. 300-302).
The source of constraint on new ideas that endured for so many centuries, at times ebbing but always present, was due to the singular theological influence that dominated the social fabric of Western cultures. During the middle Ages, the accepted science was that of Aristotle and Ptolemy and the ideas of individuals like Copernicus and Galileo were subjected to hostile treatment if they dared reveal themselves. Seeking knowledge through empiricism, experimentation, and objective research was anathema that could mean charges of heresy, prison, and torture. Ironically, serious discussions freely took place over such concerns as how many angels could stand on the head of a pin or calculations on the age of the earth based solely on biblical scriptures. The theological canon also limited ideas on human nature and behavior, holding to such concepts as original sin through which humans were thrust into the real world and forced to contend with a hostile environment.

Nonetheless, there were bright spots in the history of ideas. In the 19th century, concepts, such as adaptation, modification, and evolution were thrust into the public venue where they were received with less than friendly acceptance. Ideas such as adaptation could be innocently used to describe how humans acclimated to different climates or how selective breeding was used to obtain desirable traits in dogs or cattle. However, when the discussion crossed the line into the arena of “natural” selection and human evolution it managed to upset the whole ideological apple cart. It begs the question of how such a simple idea could cause a whole sector of society to convolute in anger.

Environmental determinism was once viewed as a purposeful way of studying human development in relationship to environmental conditions. It was an idea that questioned the consistency of an environment, what was meant by determinism, what was nature, what was human nature, and what environmental conditions were relevant to human behavior? These
questions engendered others, such as, was the human environment predominantly of a natural sort (as in Mother Nature), or was it largely the result of human machinations? Did the environment result in culture, or did culture form human behavior independent of the natural environment? In short, were environment and culture related? Could human actions and behaviors ever be completely free from the influence of the natural world? This was where this research began.

Human history was filled with wonder at the awesome power of natural events that only began to be questioned with the Enlightenment of the 18th Century, which Voltaire described as the triumph of reason over superstition. Throughout the ages phenomena such as lightening, floods, and winds were typically ascribed to pantheons of cosmic characters who became actors in mythical tales many of which included universal themes. Anthropomorphic expressions of nature that were imbued with culturally significant personifications derived from a time when virtually all cultures assumed their lives to be under the power and control of supernatural forces.

In the modern era, personifications of nature were considered the residue of ancient beliefs. They included such quaint embodiments of nature as in “Old Man Winter,” “Mother Nature,” “The Grim Reaper.” Human personality traits were more commonly described with nature metaphors such as whispering forest, an angry sea or brooding sea, and moon madness or lunacy. Personifications of nature were commonplace and suggested a self-conscious attempt to connect human traits to the awesome forces of nature. Similarly, through myths and fables, humans attributed human qualities to the natural world that seemed to exert an overarching power over human events. Environmental determinism has its roots in history long before science ever began to deconstruct the fearsome mysteries of nature that awed humankind’s spirit.
The Sumerians

Evidence of humankind’s primeval fear and awe of the natural world played a poignant part in one of the earliest known literary texts in human history, *The Epic of Gilgamesh*. This story was first recorded some time in the middle of the fourth millennium B.C.E. in Sumeria (Sumer), Mesopotamia, present day Iraq. The story long predated the invention of writing and was likely passed down from one generation to the next by oral folklorists over many decades or even millennia. Although versions of the story have been found inscribed in various formats such as wooden tablets and sun-dried clay, the best copies have been found on fired-clay tablets. Additionally, it has been found written in a variety of different languages found in the ancient Middle Eastern region that included Sumerian, Akkadian, Hittite, Assyrian, and Hurrian (Kluger, 1991).

Although written in a variety of languages, Gilgamesh was recorded using the cuneiform script that was first invented by the Sumerians and subsequently used by an array of cultures and languages that in each case, when found in its entirety, consisted of twelve tablets. However, the few examples that have been found typically were damaged with only portions and pieces remaining from archeological sites in Palestine, Anatolia, Syria, Jordan, Iraq, and Iran. The world first learned about Gilgamesh in 1872, when George Smith, an Assyrianologist uncovered and published his translation titled “The Chaldean Account of the Deluge” (Kluger, 1991, p. 22), that was later identified as a version of the eleventh tablet in the series.

George Smith’s tablet was also significant because it marked the first of many connections between the ancient world of Mesopotamia and that of contemporary Western Civilization by way of common references found in the Old Testament Bible. Scholars generally agree that Gilgamesh was the king of Uruk sometime in the early 4th millennium B.C.E., who
described as “a typical mythological hero… [Who] is virtually always partly divine and partly human” (Kluger, 1991, p. 23). Gilgamesh may well have been the archetype hero who inspired later mythical heroes such as Samson and Heracles. In an ancient Sumerian list of kings, Gilgamesh was listed as the fifth king of Uruk after the flood” (Kluger, p. 25) which attests to the fact that he was undoubtedly a historical person around whom the legend developed.

The story opens with Tablet 1 in which Gilgamesh was described as suspended between the ordered world of civilization and the chaos of nature” (Kluger, 1991). Further, the citizens of his great City of Uruk complained that Gilgamesh was an oppressive ruler who was no longer supported by his people. Worse, Gilgamesh was at odds with nature itself. In desperation, the people of Uruk:

Called out [for help] to the sky-god Anu, the chief god of the city. In response, Anu created a wild man, Enkidu, out in the harsh and wild forests surrounding Gilgamesh's lands. This brute, Enkidu, had the strength of dozens of wild animals; [and became a] subhuman rival to the superhuman Gilgamesh. (Tablet 1)

As a manifestation of nature Enkidu avoided contact with civilization until a young trapper spotted him in the forest setting the animals free that had been caught in his traps. Upon hearing about this encounter his father told him that:

My son, there lives in Uruk a certain Gilgamesh.
There is no one stronger than he is;
he is as strong as the meteorite of Anu.
Go, set off to Uruk,
tell Gilgamesh of this Man of Might.
He will give you the harlot Shamhat, take her with you.
The woman will overcome the fellow…as if she were strong.
When the animals are drinking at the watering place
have her take off her robe and expose her sex.
When he sees her he will draw near to her,
and his animals that grew up in his wilderness
will be as alien to him
(Carnahan, Tablet 1)
The alienation from nature is a powerful imagery and an essential element of civilization. Civilized man has adopted an alternate physical environment that rings a similar theme to that found in *Genesis* gaining knowledge from the forbidden fruit becomes an estrangement that is followed by eviction. That mythical separation from nature has been a conflict with his true self that has dogged civilizations since the concept emerged. Is human nature at odds with the natural world? According to members of the encyclopedia movement of the 18th century, it seemed curious that philosophers had spent so much effort trying to understand the world of nature…; and that they should have neglected the study of the world of nations or civil world, which since men had made it, men could hope to know” (Giambattista Vico, 1725, cited in Baumer, 1977, p. 149).

The common themes found in Gilgamesh continue after the young trapper takes the harlot Shamhat into the forest as instructed because his father told him that if Enkidu submits to the woman, he will lose his strength and wildness. Like Adam’s weakness before Eve, Enkidu submitted to Shamba and lost Eden. Further, like Samson after falling to Delilah, Enkidu lost all his great strength and became a foreigner in the wilds of his beloved world of nature (Carnahan, 1998). In another obstacle of nature, Gilgamesh became obsessed with the secret of immortality that he learned is known only to Untapishtim the man who was given the secret after, like Biblical Noah, saved the chosen humans and animals from the Great Flood. As Gilgamesh seeks his answers he has many adventures like Herakles in Greek and Hercules in Roman mythologies. The parallels are so strikingly similar that it may well been that *Gilgamesh* was an antecedent to and an influence for those later mythic folk heroes. If that is the case, then the Sumerian tale pushes back the history of Western thought to a far more distant historical genesis (Gardner & Maier, 1984).
Another important element in the Gilgamesh epic occurred when he and his friend Enkidu made a journey to a great cedar forest that was guarded by the terrifying monster, Humbaba who’s “shout is the storm-flood, his mouth, fire, his breath is death” (Gardner & Maier, 1984, p. 105)); in order to cut down the forest to make additions to the city of Uruk. However, this version is more poignant because the cedar forest was a beloved to the gods that had only been preserved because of the guardian placed there by the god Enlil. Deep, dark forests are yet a mysterious force in the collective subconscious of Western Civilization as the home of scary witches, goblins, trolls, and a host of other fairy tale characters (Gardner & Maier).

In the story of Gilgamesh, the bravery of Enkidu and Gilgamesh was mightily tested by the sight of the monster Humbaba who blew fire like a medieval dragon, spewing death with his breath. The heroes overcome the power of nature in the form of a fierce protector of the forest placed there by a god of nature. In some versions the god is the deforestation takes place when “[they] slew the…cedars…and Enkidu said to Gilgamesh, the cedars are felled…” (Gardner & Maier, 1984, p.146). The cedars are clearly a precious commodity pointing to the value of wood in the world’s first paradigm for what is understood as civilization – the hallmark of the modern world (Gardner & Maier).

The exploits of Gilgamesh eventually attracted the attention of the notorious moon goddess, Ishtar. She was a harsh mistress who decided to seduce Gilgamesh and thus control him – a theme that may not seem so strange to readers of romance novels. As William Congreve noted, “heaven has no rage, like love to hatred turned, nor hell a fury, like a woman scorned” (from the Mourning Bride, 1697), cited in Knowles, 2001, p. 232). But, Gilgamesh rejected Ishtar and managed to anger her with insults in the process, thus, prompting a violent response.
Ishtar begged the Sky-God Anu, her father, for vengeance against the hero, saying:

Father, let me have the Bull of Heaven
[to] kill Gilgamesh and [destroy] his city.
For if you do not grant me the Bull of Heaven,
I will pull down the Gates of Hell itself,
Crush the doorposts and flatten the door,
And I will let the dead leave
[to] roam the earth [where]
they shall eat the living.
And the Bull of Heaven [was]
sent down into Uruk.
Each time the bull breathe[d],
it[s breath was] so powerful
that enormous abysses [were] opened up
in the earth and hundreds of people
[fell] …to their deaths (Kovac, 1990, p. 104).

No doubt, this story helped the Sumerians make sense of the natural disasters they had experienced. Without science, such stories provided rationale for natural events because otherwise arbitrary disasters were incomprehensible. Again, the similarities between elements of ancient Sumeria and that of Western civilization that were introduced into the Epic of Gilgamesh have made it an intriguing topic of study and debate. In particular, folk cultures exhibited their deepest understandings and perspectives on the mysteries of nature through myths and stories. Horror movies, for example, in which tales of the living dead, or zombies, wander the earth eating the living, has elements that quite similar to the kinds of threats made by Ishtar in her demand for vengeance against Gilgamesh (Gardner & Maier, 1984). While modern consumption of such horror tales requires the suspension of disbelief to get a thrill, ancient people literally took for granted that such bizarre creatures of nature existed – especially in the shadowy worlds of forests and fen. The mythic stories helped the ancients make sense of the natural world.

Another linkage between social phenomena and that of nature has a long connection with
human mortality. Once again, the earliest writings in human history, the *Epic of Gilgamesh*, have revealed an example of the thinking of an early civilization. Gilgamesh destroyed the bull of heaven which angered the gods and subsequently his friend Enkidu, an anthropomorphic expression of nature that was chosen for death by the gods. It was because of the sins of Gilgamesh, the builder and emissary of civilization, that nature representative was punished by destruction.

The death of Enkidu and the immortality of mankind were expression of the dark reality of nature in which life and death, as the primal forces at work in the world, and what may lie beyond belonged to those who specialized in the cosmological aspect of life. The yin-yang like the polarity between nature and civilization, Innocents are always the victims in the psychic contests between various forces in the psycho-social issue in a society. Drugs, gangs, and a host of other social pathologies spread stress and psychic pain that is a price of life in the cities that mark life in a civilized world. In a parallel to the history of Easter Island, a society can destroy their own environment before they are barely aware of the problem when focused on purely cultural issues, like carving stone heads. So too, did the people of Uruk recognized too late that the loss of the cedar forest was a critical loss to their way of life. It sustained them for millennia, but one gone, is forever lost. Ecocide has continued throughout human history with far-flung examples that have been easily forgotten by succeeding generations. A few iconic examples exist, such as the destruction of trees that were associated with both the Easter Islanders and the Anasazi (Gardner & Maier, 1984).

Among the analogies between Gilgamesh and Adam and Eve the ultimate “fall from grace” and seeming injustice of the cosmological forces that punished all mankind for the errors of first citizens should not be overlooked. Further women are blamed for the fall, in Gilgamesh,
the harlot Shamhat is responsible for the fall of man when she seduced Enkidu and introduced him to the immoralities of civilization that plays like a parallel to Eve who implored Adam to partake of evil in the guise of the forbidden fruit of a tree. Significantly, Enkidu also committed a Christ-like act when he expressed a change of heart shortly before his death and forgave those whom he had cursed. Enkidu even thanked Shamhat for showing him the gifts of knowledge and civilization (Gardner & Maier, 1984).

In response to Enkidu’s forgiveness, the gods sent him a dream designed to prepare him for death. Perhaps more important, the dream story became a vehicle for the Sumerians to come to grips with their own mortality while revealing how they viewed death. In the dream, a demon took Enkidu to the —..house of ashes…the house where one goes in never comes out again…where they see no light, living in blackness… where they live on dust, their food is mud” (Gardner & Maier, 1984, p. 178). The raw nature images emerge throughout the text of this most ancient of human folk tales. These mythologies, suggest a kind of life after death, quite different from that of the world of the living. This suggested a sense of optimism that was not available to the ordinary Greek. The hero chose to spend eternity in the Elysium Fields. Death represented a kind of life that was completely integrated with nature and the earth (Gardner & Maier).

The great flood described by the Sumerians in many ways was identical to that described in the Book of Genesis. However, there was one important difference, instead of the decision of a single god, the flood described in the Gilgamesh epic followed a secret conference of the gods held in the city of Shuruppak on the banks of the Euphrates River. At that gathering, the gods swore an oath that, after the destruction of the world, they would never again reveal the secret of immortality to any human” (Gardner & Maier, 1984). Ea, the god responsible for creating humans, however owed a favor to Utnapishtim and told the secret to the walls of Utnapishtim's
house, thus, technically not violating the oath of secrecy. In startling similarity to one of Western civilization’s most famous creation myths, the god Ea advised the walls of Utnapishtim’s house to build a great boat with its length as great as its breadth and to bring samples of all living creatures into the boat. Utnapishtim built the great boat and loaded it as instructed by Ea. Subsequently, Adad, the god of storms, brought forth the dark clouds accompanied by endless rain, thunder, and lightening that continued until the boat floated freely and the south wind blew; it gathered speed, stormed, submerged the mountains, …[and] like a war it swept over everything” (Gardner & Maier, p. 235).

The Gilgamesh epic provides many insights into a worldview that predates our own time by as much as forty centuries. Similar to modern America, the Sumerians were a people who believed that they had been singled out by the grace of the gods for the blessings of civilization. Like modern civilization, the Sumerians saw themselves as having risen above the savagery that characterized the lower animals and the uncivilized barbarians. This theme continued down through the ages as one civilized society after another viewed its special position as far above that of the primitive world of nature.

The Ancient Greeks

Ancient cultures imagined the world to be full of fearful and mysterious phenomena that, in the absence of scientific reasoning, were described by complex systems of mythologies. In those times, people tended to perceive their existence as suspended between the heavens and earth and as mere playthings of the gods. Everyday life included innumerable activities aimed at maintaining a favorable equilibrium with the gods who represented mysterious elements such as winds, storms, and planetary objects including the sun, Mercury, and Saturn. Ancient Greek mythology included numerous creation myths that, in turn, had numerous variations. Most of
these contained some kind of miraculous birth story in which humans were the inevitable result of a dynamic mix of two natural elements, for example, Earth and Sky Urana (Uranus). The following Olympian creation myth is an example.

Mother Earth emerged from Chaos,
And bore her son Uranus as she slept.
Gazing down fondly at her from the mountains,
He showered fertile rain upon her secret clefts,
And she bore grass, flowers, and trees,
With the beasts and birds proper to each. (Graves, 2003, p. 35).

Another Mother Earth variation offered the first human, Pelasgus, “ancestor of the Pelasgians; who sprang from the soil of Arcadia” (Graves, 2003, p. 35). The implication of these ancient Greek creation myths was that humans were tied to the environment and subject to natural law. This connection between the natural world and humankind continues in the Judeo-Christian literature. A parallel linkage to knowledge is intriguing by being similar to that of the Sumerian’s Gilgamesh. The story of creation found in Genesis expresses the primordial linkage of man and nature, in which:

God formed the man from the dust of the ground and breathed into his nostrils the breath of life, and man became a living being. Now the LORD God had planted a garden in the east, in Eden; and there he put the man he had formed. And the LORD God made all kinds of trees grow out of the ground – trees that were pleasing to the eye and good for food. In the middle of the garden were the tree of life and the tree of the knowledge of good and evil. (Genesis 2:6-7)

This Old Testament statement has played a role in the beliefs held by much of Western civilization that mankind is a direct product of the natural environment by way of divine action. Modern explanations and understandings of the natural world were, in part, a product of ancient beliefs and explanations that connected the natural world to cosmological phenomena that permeated the collective consciousness. Although, modern culture no longer thinks of weather,
such as the North Wind, as an anthropomorphic being with a long beard who blew on a conch shell, references to such personifications are a common element cultural mythology. While tendencies to see life in the dynamism of nature, there is contrary lack of such personifications of civilization as characterized by cities.

In the Greek world of the distant past, the city-states were essentially manifestations of culture that reflected beliefs about the special position of civilized man as a modifier of nature. Largely consisting of rugged, mountainous terrain, their cultural world was mostly found in small, isolated communities and singular lifestyles that were well-adapted to fit the local conditions. Though loosely amalgamated as one culture, they developed unique customs, constitutions, and religious rites in relative isolation. With the exception of the various associations or leagues of city-states, the Greeks showed no desire to create a unified system in the sense that the Romans did but, rather celebrated their singular independence from any extraterritoriality exerting any influence over their culture. Ironically, they also celebrated their shared Greek culture in a variety of ways including the athletic competitions that included the Isthmian Games and the Olympics.

Continuing further, while the Greeks were known for their war-like tendencies, they were also committed to their own cultural distinctions as exhibited by their architecture, social structures, legal systems, and individual cities – cities that were associated with the very idea of being Greeks. So powerful were their loyalties to their individual city-cultures that “they doggedly maintained their lifestyles and isolated urbanization to the very end” (Tozer, 1882, p. 191). Significantly, the character of their culture was evidenced throughout their urban structures from the most primitive traditions of reverence for the dead in which burials were typically within the household itself to the intricate assemblage of architectural elements that
referenced or implied their ordered social and political systems.

The Early Achaean Greeks were harried by barbarian invasions that destroyed many cities and directly caused the construction of fortified urban centers, which likely inspired the great walled cities of Medieval Europe. The Greek cities often featured a defensible portion that was typically the highest point in the center of the city, called the acropolis. As in Athens, the base of the acropolis was the center of commerce—the agora—that also served as the heart of their very public, pedestrian-oriented lifestyle. In their world, people, especially men, were expected to be seen in public every day; if not, there would be visitors making inquiries as to why the absence. This aspect of urbanization in the ancient world had a much deeper purpose than simply concern—it also conveyed a considerable degree of social control. It is likely that the degree of individuality expressed in today’s world would have been inconceivable to those in the ancient world (Burgess, 1997).

The strong defensive walls that surrounded many ancient cities represented a powerful psychological boundary between the wild, natural world beyond the immediate control of civilization. The walls were a physical barrier that marked the edge of the rational, social world of thinking-man and that of the wilderness where dangerous barbarians lurked—uncivilized beings who were viewed as not quite human, who disdained the order of civilization and presented an ever-present threat. The ancient tale of Beowulf exemplifies the conflict and fear that must have preyed on the psyche of ancient city-dwellers—watching and waiting for the imminent attack from the wilds beyond the city gates (Mumford, 1961).

Ironically, the cities were dependent upon the surrounding countryside for much of their sustenance; however, the problem of storing food meant that survival was generally a day-by-day matter. The kinds of foods available changed dramatically depending on the seasons, and in the
event of crop failure the city was in for tough times. As a result, the forces of nature were reflected in their numerous religious rites, festivals, and fasting all of which were taken very seriously. Mumford (1961) described this nexus of civilization and nature as a "philosophy of universal law, of fixed unalterable order, of inflexible devotion to duty, come what may, corresponds ideologically with the new esthetic of the town plan, equally bent on order, [and] equally undeviating" (Mumford, p. 180).

Further, Mumford described parallels between the urban environments created by humans and the engineering feats produced by highly-ordered social systems of bee and ant colonies. He saw in their urban-like systems, that he called insectopolis, many of the same kinds of institutional and social patterns that characterized human urbanization, including:

The strict division of labor, the creation of a specialized military caste, the technique of collective destruction, accompanied by mutilation and murder, the institution of slavery, and even, in certain species, the domestication of plants and animals. Most significant of all, the insect communities that exhibit these traits boast the institution I have taken to be central in this whole development: the institution of kingship. Kingship, or rather, its feminine equivalent "queenship," has been incorporated as a supreme biological fact and the life of the whole community depends on the life of the monarch . . . [and] here, one finds such organized collective aggression by a specialized military force as one finds first in the ancient cities. (Mumford, 1961, p. 14)

In the earliest human cultures, nature became interwoven into the fabric of social traditions and religious beliefs. For example, fertility rites were typically associated with autumn while purification ceremonies were invariably spring events. These were cultural adaptations to a mythologized environment reflecting the basic idea that humans were natural products of nature. In later Greek times, a kind of counterculture developed, espoused by various schools of philosophy that viewed humans as "elements of the natural world rather than simple playthings for the amusement of the gods" (Smith, 1960, p. 15). These patterns were found everywhere among the most civilized human societies as well as in nature where "purpose is ingrained in all
The writings produced by the Greeks during the Classical Age, encompassing the years between the beginning of the Persian Wars (490-479 BCE) through the end of the Peloponnesian War (431-404 BCE), offered many examples of how far-reaching the influence of nature was on nearly every aspect of Greek life. The Greeks were famous for their thinking about worldly ideas as well as abstract concepts, such as philosophy and mathematics, which was due, in part, to the opportunities made possible by the world in which they lived—the polis. The inestimable belief that their world represented the highest order of civilization helped foster a sense that anything was possible. Further, it was attributed to the very structure of the Greek polis in which a complexity of social opportunities, meeting places, and substructures were available that contributed to the spread of new ideas and the transmission of knowledge (Mumford, 1961).

Zeno of Critium taught in the Stoa which was as a kind of porch providing shade a pleasant environment for intellectual discussion. Stoicism was directly relevant to the physical surroundings in which it developed. The balance among the cultural elements and the natural landscape was reflected in the philosophy of stoicism that believed in an ordered universe in which human culture could be ordered and logical. It promoted the health of its citizens and that leisure should be afforded as well as time for intellectual pursuits. Stoicism encouraged free speech and promoted democratic ideals that reflected man's nature in a natural world (Mumford, 1961).

Arts of contemplation and disputation grew to occupy an important role in ancient Greek culture and eventually became the world’s first secular religion. Philosophy could debate any issue from esoteric and metaphysical to pragmatism and realistic. No wonder that individuals such as Plato and Aristotle devoted their time and attention to examining the structure and
benefits of life in a city. In the city there was the freedom to study, learn, and communicate as was nowhere else in the world so productive. They recognized their world was unique because in the polis knowledge was respected and preserved for the benefit of posterity. Complex and pragmatic mixed interchangeably – like the value of a house that has a southern exposure was noted by both Plato and Aristotle as important for a number of reasons, including light, warmth, and general health. It was a bit of practical wisdom that “the people of the northern hemisphere have repeatedly lost and rediscovered over thousands of years” (Mumford, 1961, p. 187).

Practical maxims such as those attributed to Hippocrates were often quoted in support of city planning, especially regarding the importance of constructing numerous reservoirs, water fountains and cisterns in order to make cities more livable. Further, the Greek polis provided many outlets for leisure activities that were widely available and promoted their healthful benefits. It was during these leisure activities that politics became the sport of all citizens, while philology, philosophy, and education gained acceptance as viable career paths. Further, their Ionian environs provided the earliest examples of geometric cities as well as the first city plans and city planners who recreated their vision of social order epitomized by an orderly polis. Order and geometry were clearly drawn on the landscapes of Miletus and Thurium by the great architect and city planner, Hippodamus. His ideal city as a reflection of humans over nature was recreated by Pericles in Piraeus, the port city of Athens and one of few Greek cities that broke with tradition and adopted “the geometric grid plan invented by Hippodamus” (Mumford, 1961, p. 193).

The issue of city morphology grew out of the early city planning ideas introduced in Miletus on the Meander River. Located in Asia Minor, contrasted with the order of city of Miletus was noted for its winding course” (Chantrell, 2002, p. 322). While Miletus developed
regularity and orderliness based upon rectangles that stood in stark contrast to the messiness of nature, some, like Plato, were opposed to the geometric city, which he considered a mistake. His chief concern was that a grid-patterned city would permit easy access by barbarian invaders. He felt the environment should determine city morphology and that irregular streets would provide an extra measure of security because only the residents could easily find their way around the myriad complexity of streets following the natural topography. Nonetheless, the geometric city plan appealed to many Greeks who envisioned a world in which civilization transformed the landscape to fit "the collective interests" (Mumford, 1961, p. 119) of the polis. This crucial point cannot be over emphasized because it was the structural form of the polis and the accompanying intellectual character of the Greeks that was subsequently recapitulated throughout the whole of Western civilization.

During the 1880s, Rev. Henry F. Tozer (1882) delivered a series of lectures on the geography of Greece reflecting the perspective that the "physical conformation of the Greek continent" (Tozer, p. 190) was the single most important factor that resulted in "the Greek character" (p. 190). He claimed that the structure of the Greek polis exerted such a powerful influence over their politics" (p. 190) that Europeans and their colonial offspring recreated the Greek vision of order among the chaos of nature as a central theme infused into the architecture of their cities. Among those, Aristotle was concerned with truth and understanding that viewed as only possible from personal experience with the natural world, and that the polis was the highest expression of the natural world. (Tozer, 1882)

Among the early leaders of these natural schools of thought were Pythagoras and Empedocles, both of whom exhibited a deep sense of the kinship between humans and nature" (Smith, 1960, p. 15). Another important figure in ancient history that contributed to the nature-
nurture debate was Orpheus, the mythical founder of the “Orphic” school of thought. According to this perspective, the universe was considered a process rather than a place or thing. Instead it was a dynamic kind of evolutionary thinking in which all the elements, and all living organisms—including humans, mingle and interchange its constituent parts in a continuous dynamic cycle” (p. 15). Similarly, the Epicurean philosopher Lucretius claimed that all living creatures lived in a symbiotic relationship with one another in which their constituent atoms were merely the result of random attachments” (Smith, p. 15). This view had intriguing similarities to Pantheism and reincarnation beliefs of some Eastern philosophies like Buddhism and Hinduism.

Hippocrates, famed for the Hippocratic Oath, expressed some thoughts on the idea on environmental causation in his writings of the 4th Century B.C. E. He applied pragmatic techniques of investigation into human ailments and recorded the effects of various treatments in his quest to find real causes for sickness. His investigations of cause and effect were recorded in his book, *Airs, Waters, Places* (qtd. in McGovern, 2002, p. 730) in which he registered surprise by how simple changes in the natural environments had enormous effect on human health, noting that:

The climate, the seasons, the winds, the topography, the drinking water, and the relative exposure to those elements determine to a great extent the physique, temperament, intelligence, and therefore even the culture of the people who live there” (qtd. in Bilski, 1980, p. 55).

Further, Hippocrates made, “shrewd observations about the geography of disease and the role of the environment in shaping the health of a community” (McGovern, 2002, p. 730), considered both the psychological and physical health of the inhabitants in the regions he observed. Bilski (1980) noted that Hippocrates’ studies on, “how environments affect organisms should properly belong to the field of ecology” (Bilski, p. 55) and that pushes back the study of
human ecology more than a thousand years. Further, he stated that ecology was, in part, "the study of how environments affect organisms" (p. 55), and credited Hippocrates as the principal pioneering figure in the study of human ecology. As an associate professor of history at the University of Arkansas, Bilski conducted extensive studies on ancient cultural attitudes and relationships with the environment. Among his analyses, he claimed that the philosophical orientation of Aristotle was founded on the physical environment. He began with the idea that "development and functioning of all organisms is intricately interwoven with the physical environment" (p. 53). He suggested that this interrelationship went beyond the physiological dimension, resulting in human behaviors that responded to the interactions between organisms and affected the development and functioning of humans. He stated in *Metaphysics* (ca. 370 BCE), that, "all things are ordered together somehow . . . and the world is not such that one thing has nothing to do with another, but they are connected" (qtd. In Bilski, p.55).

The Phoenicians were voyaging far and wide in their great black ships, described by the Greek historian, Herodotus, writing about 440 B.C. He described how they traded anywhere, with anyone, by essentially stacking trade items on the beach, the natives stacked up their own goods in a similar pile, and backed away and the traders carried off the trade goods. How far the Phoenicians went in their trade expeditions were conjectural. That they traded as far as Norway and Iceland was known because of some tantalizing writing provided by a 4th Century Greek, Pytheas of Massilia, who described "a remarkable voyage beyond the northern parts of the inhabited world" (Bowder, 1982, p. 410) into the Atlantic, north to Iceland and then on to Norway, eventually circumnavigating the British Isles. The travels were verifiable due to his accurate description of numerous islands and other distinctive landscapes including locations lying more than six days sailing north of Britain" (p. 410), which when cross-referenced to
description of the declination of the midday sun establishing travel at least as far north as latitude 65 degrees (Bowder, 1982).

If that were not enough, Pytheas provided astronomical descriptions to plot various locations, providing further evidence authenticating his travels. Nonetheless, for centuries his voyage was completely dismissed and considered impossible by a consensus of scholars. Considering the multitudes of unknown voyages, such as those made by illiterate fishermen and others who left no record of their passing, it was easy to imagine that traveling to further locations was more common than the record suggested. In the centuries following Pytheas, most viewed his voyage as pure fabrication but, today, few would deny that Pytheas sailed into the far north as he claimed. The years of doubt illustrated that what counts most was what the scholarly community believed rather than what the evidence suggested (Bowder, 1982).

The Phoenicians frequently made long-distance voyages to the British Isles even though there were few surviving records. The Phoenicians referred to Britain as the Tin Isles because that was where they obtained much of the tin in great demand for making bronze in the eastern Mediterranean region. The Phoenicians traveled wherever potential for trade existed. There was even evidence that about 600 B.C., their reputation as dependable voyagers to far places was so great that they were asked by the Egyptian pharaoh Necho (r. 610-595 B.C.E.) to…sail south out of the Red Sea and return from the west via the Pillars of Heracles – in short, to sail around Africa–(Edey, 1974, p. 62), and that is precisely what the Phoenicians did, taking some three years to accomplish the feat. The circumnavigation of Africa was not attempted again until the late 15th century and not matched until Vasco da Gama ventured all the way to India (Fagan, 2008).

The voyages and explorations conducted during the Age of Discovery marking the end of
the medieval era were well documented by literate Europeans. It was more an age of rediscovery by Europeans because more contacts were made across the Atlantic than was previously believed. The discovery of the so-called Kennewick Man in Washington State suggested much earlier contacts with Europeans. The voyages of the Vikings into the Americas were certainly made, if not induced by, in the era of climate change known as the Medieval Warm Period that had remarkable impacts on climate around the world from around 800 A.D. through 1250 A.D. (Boorstin, 1983).

It was clear that the Greeks also understood that the physical environment presented natural limitations to the extent and growth of the city. Quite likely, most of the Greek city-states could easily have absorbed much larger populations simply by extending their trade networks, but they chose not to do so. Rather, they were convinced that the “good life was dependent almost entirely on the intimacy that only comes from small numbers” (p. 185), so the answer for many cities was to export people. The consequence was the seeding of numerous colonies around the Mediterranean and Black Sea regions. Unlike the colonial empires of the European powers of the colonial era (16th-18th centuries), the Greek colonies owed nothing to their originator cities (Mumford, 1961).

The Greeks did not consider their colonies as extensions of territory as was the case with European colonization in which the colonies owed obeisance and economic subservience to the mother countries. Each new colony was expected to become a self-supporting reflection of a typical Greek city. In this manner, Hellenic culture was spread through the establishment of colonies, each of which became carbon copies of its progenitor with more than 70 colonies begun by Miletus alone. The man-versus-nature dichotomy represented by cities was of central concern as the polis became synonymous with the development and well-being of the Greeks.
This concern was due, in part, to the Greek fear of urban disintegration, such as that which occurred in Babylon, which according to Mumford (1961), occurred as a result of the greatly increased size with which the city had grown.

In fact, Babylon became so enormous by the 6th century that many residents were completely unaware that the city had been conquered until days after its fall to Cyrus the Great in 539 B.C.E. Aristotle pointed out that ideally “the size and extent of a city should be such as to enable the inhabitants to live temperately in the enjoyment of leisure” (p. 188). His impression of Athens and Corinth was that they had grown to large, even larger than was sustainable, practical or beneficial to its citizens because, “as the city grew larger so to did ever larger amounts of systematic repetition become necessary to keep it going” (Mumford, 1961, p. 156). The implication of vast amounts of repetitious overlapping of activities ultimately creates friction and contentiousness.

However, as long as the Greek cities remained small, primitive rural ways were not necessarily noisome or threatening to health.

The sun is an efficient antiseptic, the open earth an acceptable compost heap, and the pig and the dog are eager scavengers. [Unfortunately], there is plenty of evidence to show that filth of every description heaped up at the borders of the city; it was at such municipal dumps that unwanted babies in Athens were exposed and left to die. [It is] no wonder that Aristotle prescribed in his Politics that official sanitary inspectors be appointed to exercise supervision over the town’s refuse; for the quantitative change from village to city had also produced a qualitative change that neither nature nor the old village ways could cope with. (Mumford, 1961, p. 130)

It was widely believed among the Greeks that there were functional and natural limits to the size of cities that, once exceeded, resulted in undesirable health and social consequences such as plague and undemocratic politics that could be best monitored in small communities.

It is extraordinary that they were able to make such advances in the arts, literature, and
philosophy, and maintain such a remarkably advanced culture in settings consisting of small, isolated communities that almost continually waged wars against one another or otherwise verged on the edge of starvation. (Mumford, 1961, p. 128)

Plato also reflected the typical Greek idea that only small cities could achieve true democracy. The rugged natural landscape of Attica was inadequate to support a large population with local agriculture alone. Due to its landscape, Athens became a successful city of about 100,000 during the latter part of the 5th Century. While not large by contemporary standards, few other Greek city-states exceeded a population of 10,000. The ability to support such a population with such a landscape was the ingenious niche as maritime traders were particularly good at playing the role of intermediaries throughout the Black Sea, the Aegean, and the Mediterranean. Their only competitors were the Phoenicians who relied more on direct trade, carrying their goods consisting of lumber and a host of manufactured items such as furniture, jewelry, textiles, and especially dyes made from a mollusk that inhabited the shores of the Phoenician Levant” (Edey, 1974, p. 58).

The physical environment of the Balkan Peninsula and Ionia played an important role in the cultural development of the culture of ancient Greece. Similarly, the topography of Mesopotamia with its great rivers, irrigations systems, and highly ordered societies advanced agricultural development that produced the greatest agricultural return in ancient history. The landscape of ancient Greece was largely made up of small, isolated city-states and far-flung independent colonies. Moving from the civilizations of the great river of valleys toward the mountains, the culture of the Greeks shifted focus over time away from labor-intensive grain-based agriculture with a special focus on beer making to that of vineyards and winemaking. The steep rocky landscape and isolated valleys that characterized much of the Balkan Peninsula
created small-scale horticulture based on orchards and vineyards that were ideal for less labor-intensive production supporting smaller populations. As a result, today “even peasants in the Aegean region might know leisure and enjoy its fruits” (Mumford, 1961, p. 119). Greek culture was so admired by the Romans that they actively emulated it in virtually every respect of their expansion and settlement (Mumford).

The Greco-Roman cultural paradigms eventually influenced virtually every corner of the world, transmitted by invaders, explorers, missionaries, colonizers, and traders. The ubiquitous legacy of the Greeks was found in the arts, architecture, theater, literature, philosophy, religion, land tenure, cadastral patterns, law, politics, philosophy, geography, mathematics, warfare, and history-writing. Hardly any portion of world was untouched by the imprint of Greek culture especially as it was reinforced by the Romans who recognized the administrative advantages of a well-ordered society. The Greco-Roman sense of order was reflected in the physical urban environments they created and within which they rose above nature by making their cities safe, secure, and remarkably hygienic for their time. An essential characteristic that helped foster democracy as societies faced with increasing complexity...man[kind] has tended more and more to work in groups” (Johnson & Kobler, 1962, p. 397). Today, decision by vote of committee members acting as representatives for every niche and special interest of the social order has become commonplace. The model for this landscape of democratization has its roots in the gradual loss of individual responsibilities and identity to the care and operation of the group (Johnson & Kobler).

The result was urbanization that expanded well beyond the controlled physiological size believed possible by the Greeks. Democracy was a product of village-life as carried forth into small Greek cities where there was a constant rotation of human functions and civic duties, that
essentially translates into full participation by each citizen” Mumford, 1961, p. 124). Another aspect of the special kind of democracy that Athens became was its international status as a trading city. The tendency for mixing of many different peoples – what we would call cultural diversity today – translated into dynamism and synergism characterized by a torrential outpouring of ideas and images in drama, poetry, sculpture, painting, logic, mathematics and philosophy” (Mumford, p. 124).

As the city developed, the democratic habits of the village would be carried into specialized activities, with a constant rotation of human functions and civic duties that essentially translates into full participation by each citizen in every aspect of the common life. And though this was a sparse material culture, in many places little better than a subsistence regimen, it gave rise to a new kind of economy of abundance, for it opened up the virgin territories of mind and spirit that had hardly been explored, let alone cultivated. The result was not merely a torrential outpouring of ideas and images in drama, poetry, sculpture, painting, logic, mathematics and philosophy; but a collective life more highly energized, more heightened in its capacity for esthetic expression and rational evaluation than had ever been achieved before. (Mumford, p.124)

The Romans

All the amazing achievements of the Greeks were represented by the culture expressed by the Polis. There was no question in the Roman mind what form a city should take. Because of the Romans admiration of the geometric urban form they wholeheartedly embraced it in virtually all Roman cities. Additionally, Rome adopted the culture of the Greeks with a determination and sense of purpose that included copying much of the Greek ways throughout the Roman Empire. In addition to serving as a city plan, the geometric form was repeated in every Roman army camp where the highly structured arrangement of tents provided a unique address for each and every soldier that was precisely replicated from one campsite to the next. The advantages such an ordered arrangement offered for communication, logistics, security, and command and control of personnel were among the factors that made the Roman army so
effective, powerful, and admired. The military might of Rome provided further proof that the Roman civilization was superior because, at anytime or anywhere it chose Rome could impose its will. In this manner, the Roman state used its centralized political organization to extend control over an ever-widening array of conquered territories.

Many times, the new regions that Rome conquered were nothing more than wilderness in which the extension of Roman civilization was a statement of “victory over the chaos of nature” (Mumford, 1961, p. 207). However, in one brief incident in history, nature seems to have won over civilization and left an enduring legacy of fear and loathing that infected the minds of the Romans and their cultural successors into modern times. That singular event was not the worst disaster the Romans ever experienced; however, it was undoubtedly a turning point in history. Thereafter, Rome never again gained a major foothold among the German tribes that managed to induce a fear in the minds of Romans that gained momentum over time.

The event that shook Rome to its foundations was a military disaster in which the natural terrain worked against the organized army the Romans sent into German territory. In terms of the worst Roman defeat that has been identified as Cannae in 216 B.C.E. in which Rome lost more than 60,000 soldiers to slaughter by Hannibal’s precision fighting machine army. Just the year before, in 217 B.C.E., Rome was defeated by Hannibal at Lake Trasimene with a loss of more than 20,000 soldiers. However, the annihilation of three Roman legions at the Battle of Teutoburg Forest in 9 A.D, with a loss of slightly more than 14,000 Romans was, by far, the most profound defeat ever suffered by Rome.

Historian, Edward Shepard Creasy listed Teutoburg Forest as one of the Fifteen Decisive Battles of the World (1852). In addition, Nobel prize-winning historian, Theodor Mommsen (1885) pointed to the Teutoburg Battle as “the turning point in Germany’s national
destiny” (qtd. in Murdoch, 2006, p. 7). It also marked the turning point in Roman attempts to conquer Germany. In fact, Emperor Caesar Augustus wrote in his will that “no Roman army should ever cross the Rhine River” (Murdoch, p. 131). More ominous for history was a great fear that enveloped the Romans and their successors in that they

forever saw forests as dreadful places to be avoided and cleared, homes to dragons and trolls, [and] the antitheses of the civilized city of [Rome], [while the Germans of] the north … understood them to be healing, protecting, mystical, spiritual places. (Murdoch, 2006, p. 7)

Writing on the Teutoburg battle, Gill (2003) declared, “How you feel about a silent birch forest at twilight says more about your blood line and your kin than [does] your passport” (from Gill is Away (2003) qtd. in Murdoch, 2006, p. 7). Today, Northern Europeans retain a view of forests environments as sacrosanct. They were the places where great heroes were protected while they stuck out against oppression. Like the German hero Arminius, Robin Hood became an archetype who operated close to nature from the safety of the forests to confront incursions of civilization. However, the dominant traditions that were relocated to North America included the Christianized Roman fear of forests and the pragmatic response that led to deforestation for the greater good of civilization. Their lasting legacy was the clear-cutting of much of North America that both demonstrated the power of civilization over the chaos of nature while providing the resources needed to build its great cities (Mumford, 1961).

The Europeans

Montesquieu (1689-1755) was greatly respected for the insightfulness into the workings of politics which he published in De l’esprit des lois (1748), in which he described the power of nature to influence societies. According to Montesquieu, “The influence of climate on politics [was evident in ancient Greece where the] sterility of the ground in Attica resulted in the
establishment of a popular form of government, whereas, the fertility of soils around Sparta was reflected in the establishment of an aristocratic government” (qtd. in James & Martin, 1981, p. 104). Furthermore, “people develop different characteristics in cold climates than in hot ones” (p. 104). Montesquieu argued in support of the idea of an environmental basis for behavior. Following his famous experiments with a sheep’s tongue, Montesquieu noted that, when frozen, the papillae would virtually disappear but when warmed they would expand considerably. Thus, a corollary was drawn with people living in cold countries compared with those in warmer regions suggesting that warmer regions are correctly characterized by increased levels of sensory awareness (James & Martin, 1981).

During the past century, the physical sciences blossomed with the advent of germ theory. Meanwhile, the social sciences adopted new systematic paradigms that began approximating the successes of positivism in the physical sciences with a personally involved approach that has become known as post-positivism. The enormity of social issues in the United States has generated a plethora of new ideas that, in turn, produced ideological clashes and spirited competition among various scientists, scholars, and academic communities. Among those that stirred the most intense ideological debate revolved around the perspectives of Herbert Spencer (1820-1903), a social commentator who was influenced by Darwin’s idea of natural selection. Spencer developed his own interpretation of evolutionary theory as applicable to social phenomena that were described in his *Principles of Biology*, published in 1864.

Spencer’s organic perspective, as applied to social phenomena, played a powerful role in the development of the theory of environmental determinism. In Ratzel’s view, the natural environment was the prime mover that generated human activities, social paradigms, as well as human adaptations and responses. In tandem with a psychological attachment to place, or
territoriality, the sense of place at the center of the concept of ethnicity has its genesis in the environmental itself. The affinity between the environment and human cultures, as summed up by environmental determinism, was embraced as a fairly straightforward way of explaining how cultures develop. As product of natural forces, the philosophy of environmental determinism benefitted from the association with Darwin’s evolutionary theory which was a wildly popular topic of debate at end of the 19th century (Hartshorne, 1961).

Empirical studies have generally supported evolutionary theory while the application of Darwin’s ideas to social phenomena have faired less well. The empirical evidence connecting natural selection to social phenomena has been inconsistent and in the absence of consistent outcomes in response to comparable conditions was a blow to confidence. Given the failure of relevant theories, such as Social Darwinism, the fate of environmental determinism was sealed. Subsequently, the stature of natural selection has grown within the physical sciences, while it has been essentially purged from the social sciences (Hartshorne, 1961). The question is why did such a promising theory succeed so well in one realm of science while failing in the other?

In the interim period following the presumed demise of environmental determinism new ideologies emerged to fill the void. In reality, however, only the term environmental determinism was purged while the philosophical beliefs managed to survive intact under other taglines. As a kind of social substratum, environmental determinism has persisted with strong support from fundamentalist religious beliefs. Thus, it is has occupied a somewhat incognito existence among the public sector where it continues to exercise an influence in the academics where it asserts itself as given assumptions, postulations, and unchallenged premises (Hartshorne, 1961).

The persistence of beliefs likened to those of environmental determinism is frequently revealed in classic Calvinist terms and expressions such as: “God’s Plan,” “Mankind’s Destiny,”
Predestination,” “Man’s fate,” “divine intervention,” and so on. The relevance to environmental determinism is unmistakable, however, with the cosmological associations it manages to evade any issues associated with peer review – a hallmark of the academic process. Thus, ideations like those reflected in environmental determinism are immune from disproval or disapproval. It has even gained the prominence of a position close to the center of modern thinking that helps explain contemporary Eurocentrism, Americentrism, and the contrary views of “cultural Imperialism” in which Western Civilization considers itself superior to all others – a view that can be simply explained by the “Christian God [that] takes care of his own” (Herder, 1968, p. 392).

Alexander von Humboldt (1769-1859) was considered one of the world’s first modern geographers before there was a discipline known as geography in higher education. His studies included both physical geography and all its related sciences including botany, biology, geology, hydrology, geomorphology, anthropology, and sociology. He was almost obsessive in his drive to catalog all organic specimens accurately. He consistently employed strict systematic scientific field methods that set an example for scientists for ages to come. For example, he collected duplicates of specimens in case one set was lost or destroyed, and he made of copy of his journal notes for the same reason. His penchant for duplication turned out to be “providential” as a ship carrying one set of his collected specimens was lost at sea (Helfrich, 2004).

Humboldt is not well known today; however, his vivid writing style provided gripping entertainment for public consumption during the late 18th century. Humboldt gained worldwide attention from the publication of his prolific journals that described his experiences in hitherto unknown regions of South America. The public could not get enough of his descriptions of the Amazon, the Orinoco, as well as descriptions of the lifestyles of jungle natives. Perhaps most
stunning was Humboldt’s climb up an Andean volcano to an elevation in excess of 19,000 feet, which was an height never before achieved by a European. Humboldt’s fame was so great that today, more places are named after Humboldt than any other figure in history … including eleven towns in the United States and Canada, a mountain range in Antarctica and even a sea on the far side of the moon” (Helferich, 2004, p. xv).

Significantly, Humboldt was particularly concerned with the unique interaction between indigenous peoples and their natural habitat. His observations and measurements of water temperatures while on a voyage along the coast of Peru and Ecuador in 1802 was heralded by the naming of the current for him in 1840 in spite of his fervent objection.

Local fishermen had known for centuries that a powerful cold current flowed from the tip of Chile to northern Peru, from just offshore to about six hundred miles out to sea. However, no one had ever studied the flow, which is now known to produce a number of important climatologically and economic effects along the western coast of South America…The current is the most productive marine ecosystem on the planet, accounting for twenty percent of the world’s fish catch and positioning Peru as one of the leading fishing nations on earth. (Helferich, 2004, p. 260)

Following his explorations in South America, Humboldt became a guest of President Thomas Jefferson at the White House and in his private home in Monticello. Humboldt was even invited to attend the coronation of Napoleon. However, his most enduring achievement was the monumental success of Kosmos, published in 1845. His book had an enormous influence on generations of scholars and the public imagination as well as providing a superb introduction into the natural world. It was an empirical study that was derived from careful observations in the field accompanied by copious notes and journals. Wherever he explored he carried a large array of scientific equipment that permitted him to record accurate data and conduct experiments in the field as he spent years trekking through the wilderness of the Americas (Helferich, 2004).
Besides the study of the flora and fauna that he encountered, Humboldt’s ethnographic observations were detailed and insightful. He noted that the cultural world among natives was clearly a reflection of the natural world in which they lived. Because his expeditions encountered cultures only marginally impacted by the Spanish, he was able to view the cultures in the deep interior that lived essentially as they had for centuries. What he observed were hunter-gatherer cultures that were intricately intertwined with their forests habitat. For example, he pointed out that the natives typically stayed awake until well past midnight keeping the fires going, noisily talking, and laughing. At first, Humboldt found the noisy habits of the natives to be quite exasperating because he was of the habit of “early to bed and early to rise.” However, he saw the wisdom of the natives after learning that the jaguars hunted in the early evening hours and were kept at bay until they ceased prowling after midnight (Helferich, 2004).

Humboldt described the Amazonian natives as child-like but capable of extreme barbarism that included a tradition of cannibalism” (Helferich, p. 126). He learned there were reasons for every action and behavior, often based on survival or tied to their worship of nature. The natives were mostly naked except for a cloth called a guayuco around their genitals and body paint; it was considered less immodest to present oneself without a guayuco …than without paint” (Helferich, p. 126). However, the deeper reason for body paint was its protective value against the ubiquitous insects that inhabit the region. Further, the natural substances that were used conveyed information about an individual’s social status in which Humboldt noted that

The type of body paint used even indicated the wearer’s relative affluence. To make onato, the more common variety [body paint], and Indian women would mix with water the seeds of a plant called achote, beat the mixture for an hour, and allow a sediment to form. The residue would be collected, mixed with oil from turtle eggs, then shaped into little round cakes for later use…[red] pigments made from Bignonia chica (named by
Humboldt)…So highly valued was the *chica* (bignonia) that a man would need to work for two weeks just to earn enough money to paint his body once. (Helferich, 2004, p. 127)

In the prologue of his book, *Humboldt’s Cosmos* (2004), said “everything is interrelated” (p. vi.) and he later noted that the more he studied the Indians of the Orinoco, the more he was stuck …by how little they resembled Rousseau’s “noble savages”” (as qtd. Helferich, 2004, p. 127). He concluded they were a retrograde or kind of infant version of more advanced societies, and noted

*Human nature does not here manifest those features of artless simplicity, of which poets in every language have drawn such enchanting pictures…We are eager to persuade ourselves that these natives, crouching before the fire, or seated on large turtle-shells, their bodies covered with earth and grease, their eyes stupidly fixed for whole hours on the beverage they are preparing, far from being the primitive type of our species, are [actually] a degenerate race, the feeble remains of nations who, after … long dispersed in the forests, are re-plunged into barbarism.* (as qtd. in Helferich, 2004, p. 127-128)

It would be easy to confuse environmental determinism with the idea of chorology which was a particular strength of von Humboldt. It was an approach that stressed fact-gathering about various phenomena in association with the area they inhabited, and then compared how the collected phenomena differ from place to place. In addition to assessing the physical environment, the chorological approach included taking careful assessment of the cultural elements and interrelationships between culture and natural surroundings. The difference between this approach and environmental determinism was the fact that objectively gathering and recording data as opposed to looking for causal relationships. In the latter approach it is a matter of looking for what is expected. Reflecting on this perspective, Sauer (1889-1975) noted in *Recent Developments in the Social Sciences* (1927) that humans acted in accordance with their cultural ideologies to perform work on the physical and biotic features of his [the] natural
surroundings and transforms them into the cultural landscape” (Sauer, p. 321). In this way,

Man is the latest agent in fashioning of the landscape. The study of geography begins wherefore with physical geography, but—coasts are marked by ports; mountains have flung over them the trails and workings of man [that] “the development of the cultural out of the natural landscape‘… is the newer orientation [in geography]. (p. 186)

The European colonizers adopted mission statements couched as mottos that described highly generalized national purpose and aspirations. Those aspirations at times were also at the crux of justification for actions that produced events upon which history has been fixed. The conquistadors battle cry, “God, gold and glory” (Gregory, 1981, p. 103), and Manifest Destiny, the motto of the westward expansion of the United States, were pronouncements marking some of the most remarkable periods in the history of conquest and settlement. However, such sayings obscure the violence and bloodshed that was visited upon millions of innocent people and evicted whole nations from their homes and their way of lives. The Rudyard Kipling poem, The White Man’s Burden (1899), became a dictum of Eurocentrism and American racism. Kipling’s words like Stalin‘s policy of “Russification” were really pronouncements of action in which one people were expected to dominate another people. In each case, exploitation, mistreatment, and manipulation of indigenous peoples were the unfortunate costs of doing business (Gregory).

It was not just the desire to create colonial empires in the New World that drove the European conquerors to establish footholds in the western hemisphere. It was the dreams of wealth that transformed the physical and cultural environments into rough copies of the homeland paradigms. The European colonizers also believed that they were the saviors of the uncivilized cultures living in poverty, squalor, and barbarism. Conquerors always believed themselves to be naturally superior to the conquered and that it was by the grace of their God, who had given Europeans the resources to do so. Today it is known as Eurocentricism that
brought the benefits of civilization to the poor unfortunate savages and in the 19th century it was somewhat of a parallel to environmental determinism. The sense of superiority gained support by the introduction of European theories regarding climate, natural resources, and evolution. Such natural, or God-given blessings, were conducive to assumptions about creativity and motivation that drove European cultures to positions of dominance in the sphere of world events. That Europeans were able to dominate world affairs, therefore, was simply due to the “environment [that] controls the course of human actions” (Gregory, 1981, p. 103). Such beliefs became revised to fit the realities of the Western Hemisphere, where it was reinvented as Manifest Destiny, which dictated the direction of settlement and growth.

Throughout history, the nature of humans has been the subject of intense consideration by virtually every scholar concerned with social phenomena and all proposed their own unique perspective, which is indicative of how serious the subject was for scholars. An example of this concern was expressed by Earnest Renan (1823-1892), who began his education in a religious seminary where he was dismayed by the beliefs expressed that he felt had no substantive foundation in the history of Hebrews and Greeks that were the focus of his fervent studies. Renan published The Future of Science (1848) in which he described science as a departure from the superstition and supernaturalism associated with theology. He viewed the future of science as lying in the direction of positivism, a more objective approach to the effective study of nature and human behavior. Subsequently, he rejected anything that smacked of metaphysical phenomena, vital forces, or spirituality because it was untenable, indeterminate, and unable to withstand objective investigation. Renan made it his life’s quest to remove all such indeterminate causes from natural sciences. Accordingly, his perspective became associated with the view of the so-called New Enlightenment that adopted a stance that science was necessarily deterministic.
otherwise it was not science (Baumer, 1977).

According to the physiologist, Claude Bernard, “We must believe in science, that is, [we must believe] in determinism…the absolute principle of experimental science” (qtd. in Baumer, 1977, p. 311). However, Baumer (1977) suggested that there was a middle ground which he referenced in his response to Bernard that, “determinism did not necessarily rule out free will” (p. 312), further, he pointed out that determinism was caught up in the revolt against positivism that characterized the mid 20th century that had begun to adopt more pragmatic approaches to investigation of social phenomena. Further, Baumer claimed that,

[A]ll that determinism implied was the reign of law in nature, opposed to chance … following regularly from determinate conditions; hence nature’s predictability given sufficient knowledge of the conditions. (Baumer, 1977, p. 312)

Bernard described civilization as a drive toward comfort and security based on ordered predictability, while Baumer emphasized the importance of nature and its implications of uncertainty as the necessary impetus for humankind’s drive to civilize. In other words, civilization could not occur without the challenges of nature to force humans to action. It has been required a full array of multidisciplinary studies over many years to scratch the surface the workings of social dynamics. The natural sciences of the 19th century generally viewed humans as subject to nature and, if pressed, likely to revert to a primitive state of barbarism at any moment. However, there were intellectuals who differed with the typical perspective of that period. Some individuals disagreed that civilizations were merely in a transitory state for people that would eventually be subverted by their innate natural tendencies. The contrary view was opposed to determinism and instead viewed humans as graced with naturally-endowed tendencies toward altruism, cooperation, and gracious behavior. Such individuals tended to see
the value of science in its use for pragmatic purposes for the betterment of people and civilization (James & Martin, 1981).

One such pragmatic geographer was Aleksandr I. Voeikov (1842-1916) who conducted studies in meteorology and climatology that led to enormous improvements in Russian agriculture during the last decades of 19th century Russia. He made long-lasting relationships with American meteorologists by his efforts to establish a world-wide system of weather reporting using the telegraph (Saul & McKinzie, 1997, 148-149). Though that effort was not fulfilled, he revolutionized Russian agriculture through his studies that revealed the correlations between snowfall and crop yields in which the greater snow depths the better crop production the following season. This produced remarkably accurate forecasting of agricultural production in Russia (James & Martin, 1981).

Voeikov also made comparisons between agricultural techniques relative to comparable environmental conditions existing at different places on the globe. His work was considered among “the first systematic studies of climatic analogs” (James & Martin, 1981, p. 227) and his studies resulted in significant changes that produced dramatic differences in agricultural production in Russia. Among the changes he brought about was the introduction and successful farming of tea in Georgia, cotton in Turkestan, and the beginning of wheat farming in the Ukraine (James & Martin).

Although Voeikov is little known today, his impact on Russian agriculture should not be underestimated. He was staunchly opposed to the environmental determinism that was being widely discussed throughout the latter days of his life which ended in 1936. However negative Voeikov was toward environmental determinism, his studies led him some conclusions that seemed to support the basic premise of environmental determinism. In particular, Voeikov’s
studies of the agricultural practices were interpreted as human interaction and adaptation to environmental conditions developed into a designated area of study that became known as snow science that correlated snow cover and subsequent agricultural production and enabled accurate forecasting of crop yields (James & Martin, 1981). Voeikov would have likely been overlooked by the rest of the world had he not reached out to others in the field that included connections with geographers in the United States and Germany developed into long-lasting ties. Accordingly,

The ideas of Richthofen, Ratzel, and Hettner were familiar to the Russian geographers because many of them had studied in Germany. The revolutionary ideas of Charles Darwin were, perhaps, less intoxicating than they were in Britain because of the earlier studies of evolution by the Russian biologist, K. F. Rul’ye. The Russians rejected the more extreme forms of environmental determinism stemming from Herbert Spencer and also the use of the biological analogy to describe sequences of landforms as proposed by the American geographer, William Morris Davis. To be sure, some . . . historians did support the ideas of climatic influence on national character or the critical importance of the large Asian rivers in providing the setting for the development of early civilizations. (James & Martin, 1981, p. 226-227).

Interestingly, Voeikov was a critic of environmental determinism in spite of his own contributions that linked human activities and the environment. For example, Voeikov concluded from his studies of erosion that humans were responsible for the overgrazing of livestock that, in turn, resulted in serious erosion of vast areas of the Russian steppes. He also determined that “the clearing of the forests in the north could produce a change in the climate … toward increasing drought” (James, & Martin, 1981, p. 228).

Voeikov ignored the human influences that changed the landscape and that the landscape had obvious impacts on the activities of humans, known as sequent influences and a looped feedback system. This idea was central to many modern man-land associations today even though studies dealing with a natural environment are looking at altered environments, often in
ways only barely understood. Voeikov predicted that clearing of forests across the northern hemisphere would cause droughts such as the one that occurred in the American Southwest Dust Bowl region. He concluded that, "Man was a major agent of change on the surface of the earth" (as qtd. in James, & Martin, 1981, p. 229) and that the transformation of natural areas into arable landscapes involved much more than topography or soils; it also incorporated factors such as the beliefs and attitudes of the populace, their tools, and their technical skills” (as qtd. in James, & Martin, 1981, p. 229).

The Americans

It is possible that certain ideas are inherent in the cultural makeup of some cultures that describe their origins in terms of direct ascendancy from primitive connections with nature. Myths and legends with such connections gave rise to recent theories that studies in evolution that suggested humans were hardwired for certain beliefs (Glausiusz, 2007, p. 62). Harvard evolutionary biologist and cognitive neuroscientist, Hauser (2007), described religion as "the result of unconscious processes that drives moral judgments without conscious reflection” (p. 62-63). He presented evidence that people provide the same answers to questions on objective tests of moral reasoning regardless of culture, country, or environmental background. Hauser also noted in an interview for Discover that there are many other examples of cross-cultural beliefs that strongly suggest that basic moral ideologies are virtually universal. Another example it the moral belief of reciprocity that has been found in nearly every culture studied. It is, summed up by the Judeo-Christian phrase: "Do unto others as you would have them do unto you.” It is interesting to note that this phrase has a similar ring to the words inscribed on a stele found in Mesopotamia, known as the Law of Hammurabi, that were written down some five thousand
years ago summarize the ordered society based upon an “eye for an eye, and tooth for a tooth” (Exodus 21:13-17). The establishment of written laws was a revolutionary adjustment from tribal cultures in which “reciprocity” replaced “retribution” as the centerpiece of law and order. The idea of writing itself represents a major difference between barbarism and civilization. Savages, living hand-to-mouth in the realm of nature do not possess writing – literacy is something that belongs only to the most advanced civilizations (Glausiusz, 2007).

Did changes to the surface of the earth, whether by natural or human causes, cause changes in the human condition known as culture? Did adaptation to those changes have consequences for all human activities or just a few? These and other questions pose challenges to the general view that developed in geography during the past century in which the discussions and arguments often reflected different attitudes. However, by World War II, the community of geographic scholars tended to renounce environmental determinism. Likewise, there would be similar attitudes against other forms of determinism. Political philosophy turned sour on economic determinism as championed by Lenin, as well as historical determinism, as some critics of Toynbee charged. The principal concern was due to implications that if the planet were really a complex of mechanistic systems, humans would necessarily be something akin to automatons doomed to eternal predictability. History, then, would be mandated to repeat itself with no learning or adjustments to avoid recommitting past mistakes, nor would change or development occur as a result of syncretism, in which elements are pasted together in new ways, or synthesis of blended elements, or synergy, in which new elements are formed that are more than the sum of their parts (Geyl, 1949).

In 1892, the National Education Association (NEA) of the United States appointed a committee to study issues related to teaching and content in public school systems across the
country. They were particularly concerned with precollege programs for students who wished to prepare for entrance examinations. Among the areas of special focus was the study of geography in which focus groups were asked questions about what geography should include and how it should be taught. The report that followed was presented to NEA by William Morris Davis, a leading figure in the emerging field of general or human geography. Davis delivered a persuasive argument recommending that geography should incorporate spatial perspectives in botany, zoology, astronomy, economics, social studies, commerce, government, and ethnology. Davis insisted that geography should expand beyond mere description and categorization but instead adopt analytical approaches should both be employed in studies of the full array of human-nature phenomena found on the planet. Among the goals for the pedagogy of geography was to study the effects of natural influences on humans as well as the influences of humans on the physical environment (James & Martin, 1981).

In spite of failing to get exactly the kind of broader, analytical-style of geography accepted into the public school systems, Davis left a legacy of graduates from Harvard University who took his pedagogical style of geography into the realm of higher education. Specifically, the new geography that he inspired put an end to the technique of rote memorization of arcane facts in favor of more generalized applications. The new geography emphasized analytical techniques, field studies, and investigation of real-world situations as well as stressing the use of theories as tools for investigators who adopted a broader perspective to the discipline in which any and all aspects of the cultural and natural world were embraced as part of the field of study in which a spatial perspective could be implemented (James & Martin, 1981).

It took more than a generation of such proponents to get the new pedagogy of geography accepted in the public school systems. Yet, even while the public schools found it difficult to
dispose of the technique of memorization of compendiums of facts, geography, as science that straddled the social and physical sciences, managed to prevail in the realm of higher education. While Davis was frustrated by the snails pace of change, he became convinced that the only way for geography to become recognized as a professional discipline was to create an official geographic society. He felt that such an organization was needed to provide a venue for the exchange of ideas and to encourage scholarship, and as a mechanism that could give geography impetus in the curriculums of postsecondary education (James & Martin, 1981).

A major concern of Davis’ was that geography was little respected as a serious discipline among students in the U. S., because most assumed that graduating with a geography major was useful only for those pursuing careers in teaching. He believed that a formal organization was needed to help expand opportunities and to enhance the credentials of geographers. As a result of his persistence and leadership qualities, the Association of American Geographers (AAG) was established and held its first meeting in Philadelphia in 1904, where Davis was elected the first president. He was subsequently elected again in 1906, at which time he spoke on the need to develop new techniques and stressed applied geographic techniques that focused on the “study of the relationship between inorganic controls and organic responses” (James & Martin, 1981, p. 194).

In 1914, George B. Roorbach (1879-1934), pioneer in the study of economic geography at the University of Pennsylvania, published the results of questionnaires from respondents that included the leading geographers in Britain and the United States. The respondents were asked to rank the tasks in order of importance they believed should be the focus of geography. Notably, the first and foremost topic that was considered critical to geography was “the impact of the geographic environment” (James & Martin, 1981, p. 315) on social behavior.
The second item specified that a natural region – or regional studies – was also a principal area of study. The implication was that everything found within a defined area, both cultural as well as natural elements, were the subject of concern. The topic of concern that was referenced in Item 3 was the study of geography as a socio-cultural phenomenon. This was the central theme among the fourth, fifth, and sixth items as well. It is notable that virtually every perspective aspect of geography entails some aspect of culture. Perhaps, in the final analysis, another question that should have been asked was: Is geography a natural science? This question remains unanswered as yet. Instead, geography has been subdivided into subfields and whether it is natural or not depends largely on the pedagogical preparation and interests of those who teach it. Table 3 is provides the essentials of Roorbach’s listing of geographic concerns from most important to least important as identified by the leading geographers of the day.

Table 3

<table>
<thead>
<tr>
<th>Roorbach’s Order of Geographic Importance</th>
<th>Description</th>
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<tr>
<td>Highest - 1 to Lowest - 7</td>
<td>Description</td>
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<tr>
<td>1</td>
<td>Determination of the influence of the geographic environment</td>
</tr>
<tr>
<td>2</td>
<td>Determination of the world’s major natural regions and use of regional studies to reveal the dynamic interrelationships among elements</td>
</tr>
<tr>
<td>3</td>
<td>The definition and organization of geographical material</td>
</tr>
<tr>
<td>4</td>
<td>The improvement of the profession of teaching of geography</td>
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<tr>
<td>5</td>
<td>The study of the influences of geographic factors on human history</td>
</tr>
<tr>
<td>6</td>
<td>The exploration of unknown and little-known places</td>
</tr>
<tr>
<td>7</td>
<td>The study and description of physical geography</td>
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</tbody>
</table>

(after Roorbach’s scheme as cited in James, & Martin, 1981, p. 315-316)

Dryer taught geography at Indiana State Normal School in Terre Haute between 1893 and
1913, where he developed ideas regarding physical controls and human responses that were manifested as distinct economic regions characterized by specialized human activities. His ideas were presented to the American Association of Geographers in 1915. Dryer drew heavily upon Aristotle’s writings in which the interrelationships of all parts of the natural world were deemed essential components. Dryer’s approach involved dividing the United States into a number of *workable living combinations* that provided delimitations for human activities. Dryer’s taxonomy defined economic regions as solid, liquid, gaseous, and biological phenomena. The latter category was the area that included the natural environment and integrated essential controls that establish the particular types of economic activities humans might adopt (James, & Martin, 1985, p. 304).

The era in which the social sciences emerged as distinct disciplines was distinguished by the need to define the spheres belonging to each. Nonetheless, factional turf wars are an occasional issue especially for interdisciplinary studies such as history and geography. In defining these spheres of influence, debates are generally played out in the professional journals or less often in the public arena. However, it is within the professional organizations that the quality of scholarship is defined and the boundaries of proper scientific pursuits outlined the frameworks of practice debated, and consensual determinations adopted. The developments in the sciences that occurred during the years following the emergence of Darwin’s theory of natural selection revolutionized the teaching and practice of virtually all the sciences. This must be viewed in the spirit of the times when there was plethora of scientific endeavors were promoted many of which were of dubious quality that eventually fell into disgrace among the pseudo-sciences (James & Martin, 1981).

A central element of environmental determinism was the development of geography as a
true science. A critical element common to every science was the existence of taxonomies into which fundamental concepts could be organized and better understood. The need was met with a number of systems of varying usefulness. One of the earliest such taxonomic systems was designed to clarify relationships between human habitation and the prevalent natural conditions of the environment. Table 4 provides the essentials of the taxonomy in which Herbert J. Fléure (1877-1969) identified seven types of regions based upon the economic value of the landscape relative to human effort in pursuit of nutrition, reproduction, and sense of well-being (cited in James & Martin, 1981).

Table 4

<table>
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<tr>
<th>Corollary to Fléure’s Regional Taxonomy</th>
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<tbody>
<tr>
<td>Effort (Labor) Inputs</td>
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<td>-----------------------</td>
</tr>
<tr>
<td>1. Regions of hunger</td>
</tr>
<tr>
<td>2. Regions of debilitation</td>
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<tr>
<td>3. Regions of increment</td>
</tr>
<tr>
<td>4. Regions of effort</td>
</tr>
<tr>
<td>5. Regions of difficulty</td>
</tr>
<tr>
<td>6. Regions of wandering</td>
</tr>
<tr>
<td>7. Industrial regions</td>
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(after Fléure’s Taxonomy as qtd. in James & Martin, 1981, p. 315)

In the wake of Fléure’s classification system there followed numerous other efforts to provide some systematic generalizations about environments relative to human activities. These
were invariably designed as teaching aids or methodologies for studies in geography. Like Fléure, Marion I. Newbigin (1869-1934), was concerned with regional studies based upon the economies of regions. The most common question that drove these studies was why some places provided an easier lifestyle than other places. This concern inevitably brought geographic studies face-to-face with the primary issue at the center of environmental determinism – which asked why it was that cultures, as described as a way of life, displayed intricate associations with their inhabited regions. An important question for consideration pertains to what kinds of activities does a particular environment permit and how were those activities manifested as production systems. Together, these elements could reveal the interrelationships between the natural elements and their subsequent manifestation as cultural traits. The United States government employs geographers to conduct regional studies of the potential land quality and land use as the basis on which to draw up [plans] for economic development” (James & Martin, 1981, p. 219). As a result, economic geography has grown into one of the most significant areas of geographic studies.

While deterministic ideas proliferated in geographic studies, in her historical dissertation, *Environmental Determinism in Twentieth Century American Geography: Reflections in the Professional Journals*, Beck (1985) noted that environmental determinism was, the most important nature-culture theory of early twentieth-century geographical thought” (Beck, p.1). However, she noted that Standard histories tell us that by the 1920’s this school of thought had been largely ridiculed out of mainstream geography and geographers” (Beck p. 1). Beck went on to point out that, if not openly hostile to environmental determinism, [scholars] are, at best, indifferent to further debate” (Beck, p. 1). Hence, environmental determinism began to languish as a viable theoretical concept by the middle of the 20th century.
In the United States, the debate over environmental determinism was initiated by Ellen Churchill Semple (1863-1932), who was a graduate of Vassar in 1882. During her studies, she heard “enthusiastic reports about a professor in Germany, whose lectures were bringing new worlds into view” (p. 304). As a result, she went to Germany where she remained outside the lecture hall for days listening to the lectures of the charismatic professor, Friedrich Ratzel (1844-1904). Ratzel expressed his ideas during lectures that typically filled the lecture hall at the University of Leipzig. At the time of Semple’s studies in Germany (1881-1882), women were barred from postgraduate programs and for a time she could only listen at the doorway. However, Ratzel was so impressed by her sincerity and devotion to learning that he eventually permitted Semple to sit at the base of the podium where she literally studied at the foot of the master. Semple was entranced by Ratzel’s ideas on the subject of, “the geographic influences on the course of history” (James & Martin, 1981, p. 170) for which Ratzel coined the word, Anthropogeography, a term that became the title of his book that was published on the subject in 1882 (James & Martin).

In his book, Ratzel described cultures as “organic evolutionary expressions of stages of human development” (James & Martin, 1981, p. 171). Ratzel was greatly influenced by the ideas of Herbert Spencer that were later referred to as “Social Darwinism” (James & Martin, 1981, p. 170). Ratzel agreed with Spencer that there were distinct similarities between human cultures and certain kinds of organisms found in nature. As an ardent convert to Ratzel’s ideas on the power of the environment to influence cultural development, Semple began lecturing and writing on the subject after completing her master’s degree. (James & Martin) Semple could never have imagined the attention and reactions that Ratzel’s ideas would eventually inspire, nor the extremes to which those ideas would be carried by Germany’s Third Reich.
Like Spencer, Ratzel believed that there were definable relationships between the inhabited world and the natural environment. Further, it was contended that those interactions increased in complexity and sophistication as human societies progressed to higher levels of development and urbanization. When Semple returned to the United States, she became a popular lecturer at the University of Kentucky where she enthusiastically expounded on Ratzel’s ideas. In addition, as a visiting lecturer, she helped establish human geography in the curriculums of Wellesley College and the University of Chicago (Rosenberg, 2006). Semple established herself as a true geographer as a result of:

…her outstanding field work and research into the people of the Kentucky highlands. For over a year, Semple explored the mountains of her home state and discovered niche communities that had not changed much since they were first settled. The English spoken in some of these communities still carried a British accent. This work was published in 1901 in the article “The Anglo-Saxons of the Kentucky Mountains, a Study in Anthropogeography” published in the [American] Geographical Journal. (Beck, 1985, pp. 1-2).

Ratzel’s ideas on natural causes were interpreted for the American audience through Semple’s *Influences of Geographic Environment* (1911). She was less ardent about some aspects of Ratzel’s ideas, especially his views on “the nation-state as an organism” (p. 304), but Semple readily adopted his ideas on the relationships between isolated people and their response to the unique conditions presented by the local environment within which they were compelled to survive by making pragmatic decisions for survival. After writing several articles on the relationships between human activities and their endemic physical environments, Semple gained considerable recognition among a new generation of geographers with her first book, *American History and its Geographic Conditions*, published in 1903. Together with *Influences of Geographic Environment* she outlined her perspective summed by her comment that was her
approach to research:

…has been to compare typical peoples of all stages of cultural development, living under similar geographic conditions. If these peoples of different ethnic stocks but similar environments manifested similar or related social, economic, or historical development, it was reasonable to infer that such similarities were due to environments and not to race. Thus by extensive comparison, the race factor in these problems of two unknown quantities was eliminated for certain large classes of social and historical phenomena. (Semple, 1911, p. vii)

Her style of writing could be described as a kind of prose that conveyed convincing analogies as suggested by this section from *Influences of Geographic Environment*:

Man is a product of the earth's surface. This means not merely that he is [a] child of the earth, dust of her dust; but that the earth has mothered him, fed him, set him tasks, and sharpened his wits, given him his problems of navigation or irrigation, and at the same time whispered hints for their solution. (Semple, 1911 p.1)

Accordingly, the natural environment represented nothing less than the underlying cause of all human behavior and natural development. In the rationale that Semple absorbed from Ratzel, the environment was the defining factor in both the history of humankind and the cultures exhibited across the landscape. Further, Semple offered additional rationale for Ratzel's ideology by providing field observations that supported the thesis. One of Semple’s favorite deterministic examples was the use of mountain passes by robbers. It was an economic adaptation to the landscape in which freebooters could make a living off the travelers who were forced to pass through as a result of the morphology of the landscape. This example of determinism in action implied a fundamental idea that was difficult to counter. It was known as the *marginal land* theory in which it was declared that the environment poses certain limitations on human activities that force adaptation or destruction (Beck, 1981).

Curiously, Ratzel’s theories presented in *Anthropogeography* (1882) attracted little attention outside Germany or elsewhere in Europe, for that matter. It was not until after World
War II that hindsight revealed that Ratzel’s ideas, along with those of Herbert Spencer had been major influences on Hitler’s belief that Germany had the right to dominate weaker nations. Through his twisted perspective it became known as lebenstraum or living space, a term that was coined by Ratzel, but in the hands of Hitler it became a notorious tactical philosophy. Lebensraum provided the necessary justification in Hitler’s mind for the repression and murder of millions of people and the conquering of neighboring countries for the benefit of German people (James & Martin, 1981).

In the United States, on the other hand, environmental determinism was at first embraced and touted for several decades before its brilliance began to fade as geographers turned to alternate avenues of study. The idea then became an issue of contention between the proponents and the antagonists that rebounded through the geographic journals for decades. Why it failed to stir much comment remains something of a mystery, but doubtless there were multiple reasons. For example, Europeans believed their role was to describe the earth in its entirety rather than focus on the relationship between the earth and its human contingent.

In the chorological perspective, the role of geography was a systems approach to identifying and connecting patterns of interaction that could be empirically verified. An example may be found in the subfield of hydrology in which systems analysis breaks down the components and in doing so emphasizes humans as one element of total earth system. The Hydrologic Cycle includes evaporation and movement of water by patterns of winds that power the redistribution of air which conveys evaporated and sublimated hydrogen molecules from water and ice transformed into a state of condensation as clouds that circumscribe the earth and then dispersed over the landscape as precipitation. Finally, water may be filtered by percolation into the subsurface aquifers or redirected into a myriad of channels, streams, rivers, lakes, and
oceans, only to be returned to other states in the cycle. In this system, humans are major modifiers of the earth’s surface, and certain aspects may be altered, but in terms of earth scale, the activities of humans are more affected by the systems than the system is affected by humans. This state of affairs might be altered when and if humankind gains control over the weather (James & Martin, 1981).

Ratzel linked geography and history in his second volume by noting population distribution as the primary concern of human geography. Although his work was considered deterministic, Ratzel also stressed that factors other than the physical environment were instrumental in the development of human societies. Among these, he noted that the, “cultural environment itself, including religion, linguistics, and ethnicity” (Fuson, 1969, p. 101) directed human activities. Still, his emphasis on physical environmental elements, including mountains, rivers, and other bodies of water that directed population distributions through migrations, settlement patterns, and proximity to resources, became the focus of the environmental determinist movement that developed in the United States (Dickinson, 1969).

Ratzel's second major work was Politische Geographie (1897) that outlined what was considered the first systematic approach to political geography. Ratzel described the nation-state as a particular spatial grouping on the earth’s surface that consists of a human group with a definite organization and distribution” (Dickinson, 1969, p. 68). The unique aspect of his hypothesis was suggested by the term Lebensraum, or living space, in which he viewed human political systems as extensions of the natural organic realm. Like any natural organism, the state increased and expanded regardless of any natural or abstract constraints placed upon it. In this analogy, if bordering states were weak, there was a natural tendency to push into the territories of other states. His analogy was simply that human geographic space alone constituted a political
force (Dickinson, 1969).

In time, Ratzel softened his stance regarding the power of place over human activities. In his second edition of *Anthropogeographie*, published in 1891, he acknowledged that social factors are present in the adaptation of humans to their environments (Beck, 1985). His writings, as translated and filtered through the mind and words of Semple, had a great impact on American geographers. While she ascribed human development to both physical and cultural factors, her lectures and writing tended to focus more on the physical environment as a wellspring of development. The result was some confusion as well as controversy and divisiveness within the field of geography. As a result of the differences of opinion, geography was polarized for a time which was expressed in the geographic journals that were described in some detail by Beck (1985). However, by late 1920s, anything that smacked of determinism began to lose credibility and interest among scholars in the U. S. (James & Martin, 1981).

In spite of its “fall from grace” (Beck, 1985, p. 1), the ideological beliefs that supported environmental determinism proved to have staying power. This persistence was largely due to the influence of a small group of respected geographers. Among these, there were a number of scholars who were especially prominent. In addition to Ellen Churchill Semple (1863-1932), there was William Morris Davis (1850-1934), Griffith Taylor (1880-1963), Ellsworth Huntington (1870-1955), and Ina Yoakley (1872-1950). The latter, Ina Yoakley, stands out in East Tennessee history as a popular geography professor and Chair of the Department of Geography at East Tennessee State University from its inception in 1911 as East Tennessee Normal School. According to the university archives, the *Geography of Tennessee* (1945), and from interviews with Robert Peplies (1999), some background on Yoakley was acquired. It was learned that Yoakley was an active proponent of environmental determinism and had taught
geography for more than 34 years until her retirement in 1946. During that time she was a popular instructor and a major influence on generations of students who, in turn, influenced additional generations of students” (from interviews with Peplies, 1999). In East Tennessee, as elsewhere, environmental determinism was integrally interwoven with geography largely because major proponents were geographers and because of the spatial components of this particular version of determinism.

The association between geography and environmental determinism was a factor in the establishment of geography as a distinct field of study. Efforts to validate geography were furthered by host of scholars who represented a variety of perspectives. However, it was environmental determinism that led the way at the turn of the century and the first two decades of the 20th century. Environmental determinism essentially put geography on the map as it accompanied geography during its inaugural years as it gained a foothold in the curriculums of higher education. However, by the 1920s there were other perspectives vying for prominence among geographers. Among potential replacements for environmental determinism were: environmentalism, possibilism, probabilism, cultural ecology, and chorology. Among the alternative perspectives that garnered the most attention among American geographers were those that could make use of computer analysis. Since World War II, increasing attention [has been] given to quantification, to statistical description of patterns, and to statistical manipulation and testing of hypotheses” (James & Martin, 1981, p. 220). The objectives found in those perspectives continue to focus on human spatial behavior; however, the techniques and technologies have changed a great deal. Meanwhile, many geographic theories that have been proposed have been largely about broad patterns rather than discrete data (James & Martin).

Many of the founders of geography in the United States began their careers in other fields
– especially the field of geology. Among the most prominent among those early leaders was William Morris Davis, the founder and first president of the American Association of Geographers (A.A.G.). Davis proposed that the major goal of geography was to, “interpret, measure, and predict outcomes from given sets of data (Beck, 1985, p. 52). The idea of prediction was an essential element in the physical sciences and it became more relevant as the social sciences became established as legitimate sciences. To do this, positivistic approaches appeared among the social sciences. As one writer noted, “whether or not American geography can ever be said to develop in a deductive way, it certainly began at the right end for such a development” (Beck, 1985, p. 52).

Among those who analyzed the dynamics at work in ideological shifting occurred in the ivory towers of scientific thinking, frequently groupthink, reflected in the tendency to flock toward certain ideas that gained status as the popular paradigms of the moment. Unfortunately, the phenomenon of groupthink was also an obstacle to accepting new ideas, especially those that were alien to an individual’s culture or experience. In this vein, environmental determinism was given impetus as a result of William Morris Davis and his “habit of seeing man and his works as part of the landscape, not separate from it” (James & Martin, 1981, p. 281). Davis taught at Harvard University from 1904-1914. He, along with Ellsworth Huntington and Isaiah Bowman of Yale University, were among those who helped form the nucleus of the scholarly competition on the subject. These discussions were launched by the expanded offerings in geography at a number of institutions led by the establishment of the first department of geography in the United States at the University of Chicago in 1903 (James & Martin). The problem with teaching of geography, according to William Morris Davis, was that geographers are often so impressed with the innumerable facts of their subject that much
attention is given to individual occurrences in specified localities rather than to principles which the occurrences exemplify. (qtd. in James & Martin, 1981, p. 287)

The same thing was true of other disciplines, and, by the 1880s, Davis viewed teaching a subject like geography as an opportunity to teach about physical sciences too, because there were inherent interrelationships that made better sense when studied as a whole rather than as broken up specialties that must be studied piecemeal. He noted that the broader coverage of science offered by geography could get students thinking in terms of a more holistic framework” (James & Martin, 1981, p. 287). Davis later reported that it was his desire to enlarge the structure and scope of learning about science that led him to see that all organic life, including humans, fit into a larger conceptual structure for geography” (p. 287). His view led him to seek cause and effect generalizations …usually between some element of inorganic control and some element of organic response” (p. 287) which put in favor of the perspective of environmental determinism. Morris reported that in this idea of causal explanatory relationships is the most definite, if not the only unifying principle that I can find in geography” (James, & Martin, p. 287).

To understand environmental determinism, the history of the development of geography as an academic field should be considered. During the early 19th century, geography had generally come to refer to the study and practice of navigation. An emerging science, known collectively as natural science, was too broad for practical purposes, thus, it splintered into numerous specialties and subfields. In order to lend a sense of organization to the whole, German geographer Alfred Hettner (1851-1941) (attempted to synthesize the various categories into a holistic science of geography that was outlined in his Geographische Zeitschrift that was published in 1905. In his writing was a chorological definition of geography as the study of the
earth’s surface according to discernible differences that are found within the totality of interrelated characteristics:

If one examines the different sciences comparatively, one finds that, while the unitary character of many is determined by the materials studied, that is not true of all; in some the unity lies in the method of study. Geography belongs to the latter group. As history and historical geology study the development of man and of the nature of the earth through time, so geography proceeds from the viewpoint of area diversity. (qtd. in Hartshorne, 1966, p. 40)

Hettner’s statement of 1905 was repeated almost verbatim in subsequent articles of which the following was typical:

Empirical knowledge is concerned with phenomena of many different kinds which occur in complex interrelationships, at specific times in history and at specific places in space. The ultimate purpose is to attain knowledge, description, and explanation of the whole, in all the complex interrelations, in all the differences from time to time and place to place. But we cannot study everything at once, nor can any one student or group of students attain the competence necessary to analyze all the different kinds of problems that are involved. Hence the arbitrary division of the actual unity of knowledge into fields, disciplines, or compartments, in each of which a group of students concentrate their training and studies to secure the advantages of specialization. (Hartshorne, 1966, p. 40)

While specialization was an essential part of the sciences as well as history and geography, the development of the social sciences represented a unique situation among the various fields of study. Unlike the so-called hard sciences, biology, chemistry, and geology, the ability to show causal relationships among the soft sciences, sociology, history, and human geography, was problematic. In human geography, the diversity of cultural characteristics and other human phenomena that are often found concurrently at any given place and time can be too overwhelming for proper discrete analysis. On the other hand, if the diverse phenomena found at any time and place were independent elements so that geography, history, paleontology, or chemistry could describe in terms of freestanding, independent phenomena, the best that could be hoped for would be an encyclopedic listing of those independent elements. Thus, without
synthesis or interrelationships, history would be a purely chronological listing and geography could only be a descriptive listing of elements (James & Martin, 1981).

By embracing empiricism and scientific methodologies, geography as a study of the earth as the home of humankind gained recognition as a real science during the latter part of the 19th century. Within that developing arena, environmental determinism was described as an integral theory that addressed the interrelationship between the earth or nature, and human adaptations as evidenced by cultural responses to those adaptations. However, Sauer and other critics of environmental determinism were less concerned with trying to explain human behavior in terms of natural causes. Instead, they were more concerned with the how choices were made from among the available possibilities presented by the natural environment. Thus, Sauer developed a probability theory for the process of dissemination of seed agriculture around the world that followed the evidence remaining from human migrations and the dispersal of their technological achievements. The evidence remaining from human migrations that left a legacy of agricultural techniques and technologies became the basis for Sauer's theory of seed cultures and seed diffusion (James & Martin, 1981).

The issue of determinism infected not only geography, but other sciences as well. Beginning with Beck (1985) who described environmental determinism as, “the most important nature-nurture theory to emerge during the 20th Century” (p. 1). Her research revealed that after its fall from grace, instead of remaining quietly on the scrap heap of history, the theory continued a sentient existence in the public sphere. In this latter existence, determinism occasionally breaks though the prevailing schools of thought to reawaken concerns in some quarters of the social sciences. It is more frequently reignited when some academician has discovered a novel application or a novel perspective on an old idea (Beck, 1985).
In the wake of Darwin, scholars throughout physical and social sciences disciplines became fascinated with applications of evolutionary theory to their various specialties. In the social sciences, this effort was epitomized by Ratzel who garnered attention in Germany during the 1880s and 1890s it got little attention among other European geographers. However, in the United States, the development of an analytical geography that focused on human behaviors relative to environmental conditions. A perspective that was closely related to environmental determinism was known as chorology, which was a categorical version of geography that had gained a following in the United States during the latter 19th century. The chorological approach in geography sought to define and describe specific interactive connections between humans and the environment. It was described by Sauer as a study of geography that:

… is concerned with the study of things associated within an area on the earth‘s surface and with differences from place to place—both physical and cultural. Man behaving in accordance with the norms of his culture, performs work on the physical and biotic features on his natural surroundings and [in turn] transforms them into the cultural landscape. (as qtd. in James & Martin, 1981, p. 321)

Sauer went on to describe the environmental relationships to human cultures as a landscape that:

… includes (1) the features of the natural area and (2) the forms superimposed on the physical landscape by the activities of man, the cultural landscape. Man is the latest agent in fashioning of the landscape. The study of geography begins therefore with physical geography, but—coasts are marked by ports; mountains have flung over them the trails and workings of man. A phrase that has been used in German literature, unknown to me as to origin that characterizes the purpose perfectly: —the development of cultural out of the natural landscape. (as qtd. in James & Martin, 1981, p. 321)

Early on, Sauer was a proponent of environmental determinism before becoming one of it most vocal critics. However, it was not so much that he felt environmental determinism was the wrong approach but rather that he grew leery of adopting a single perspective. Sauer insisted,
that no field of study can be defined in terms of a single causal hypothesis that would commit the student to a particular outcome of an investigation in advance …[which would mean] going into the field to look for influences of evidences of control exerted by the physical condition, is to accept a single dogma. Sauer did not deny the possibility of environmental determinism in specific cases but insisted that the concept of influence should be exposed to objective testing. (as qtd. in James & Martin, 1981, p. 321)

While the underlying beliefs are ancient in origin, the controversy over the intent to establish environmental determinism as the core school of thought in geography, stirred considerable contention that was largely played out during the 1920s and 1930s. The quarrel that ensued was waged primarily in the academic journals in the United States. The public picked up the argument, which was oversimplified in the public mind as nature versus nurture. However, among those teaching in higher education, the issue became deeply divisive and nearly split geographers into two separate camps. Meanwhile, the public sector was generally unaware of how disrupting the issue was to the field (Geyl, 1949).

In addition to geography, the issue of determinism became controversial in other social sciences as well. Among those, it caused no little trouble for the historian, Toynbee, who was forced to defend charges of historical determinism as a result of his cycles of history theory described in his six-volume *A Study of History*, published between the mid-1930s and late 1940s (Note: *Abridgement* of vols. I-VI, 1947, Oxford Press). Because of Toynbee’s hypothesis, a number of open seminars were held, some on live radio (BBC), in which he defended his historiography as nondeterministic. These were issues that were described in detail by Geyl in a paper published in 1949. It was curious that, while the British were taken with the issue of historical determinism, geographic determinism, on the other hand, caused hardly a ripple in the U. K. (Geyl, 1949).

Unlike Europe, scholars in the United States in the latter part of the 19th century were
more concerned with efforts to gain recognition for the social sciences in general and geography in particular to establish curricular programs in higher education. In the United States, the study of human geography was first included in the curriculum at the University of Chicago in 1884, about the same time that environmental determinism was being taught at Leipzig in Germany. By 1905, the theory gained approval of leading scholars in the field throughout the United States. The critical sparring threatened the newly recognized field of human geography. Most notably, were scholarly argumentation carried out in a civilized manner among peers that could be called debates principally occurred in:


(2) the *Journal of Geography*, published by the National Council for Geographic Education.

(3) the *Geographical Review*, published by the American Geographical Society.


An analysis of the era described a general polarization of two different perspectives regarding environmental determinism that were noteworthy because all the contributions to the arguments were “distorted in [the] histories of geographical thought” (Beck, 1985, p. 1), as both proponents and detractors greatly exaggerated the subject. Some criticism was of a nature to distinguish and boost the new the ideological perspectives that were being proposed regarding humans and the natural environment. By the end of the 20th century, the social sciences were careful not use any terminology that suggested determinism (Beck, 1985).

To understand the quarrel over environmental determinism, it should be instructive to consider some assumptions regarding certain well-known subjects. For example, everyone knew what was meant by the concept of science – or did they? Another perspective, noted by a
professor of theoretical physics at Bristol University, asserted that the "true goal of scientific research is to contribute to the consensus of universally accepted knowledge" (Ziman, 1968, p. 1). In fact, Ziman debunked all the traditional beliefs about science by pointing out that most definitions were as presumptuous as trying to define life. Ziman pointed out that science was really, "more about the social-psychology of the scientists themselves than it is about discovering new information using the scientific method" (Beck, 1985, pp. 1-2).

Ziman (1968) stated emphatically that the business of, "respectable sciences such as Astronomy or Geology … only observe the consequences of events and circumstances over which [humans] have no control" (qtd. in Beck, 1985, p. 2). Additionally, Ziman declared that science was not, nor should be exclusively, the study of the material world, that unlike many who considered everything of a non-material nature to belong exclusively to the realm of philosophy or religion. He pointed out that traditional views on science have generally excluded pure mathematics, although some great philosophers have emerged from the discipline of mathematics. Neither has science been principally about uncovering the mysteries of the universe or inventing novel widgets. Too much focus on specific outcomes tends to confuse the product with the process. Instead, studies of a general sense are likely to reveal ideas, events, and innovations that only require imagination and experimentation to reveal their potential uses. Studies of societies and human environments have proven to be excellent venues for holistic research during the past decades because the corporate body of humanity exhibits patterns that are interactive with the environment. All sciences have transition zones where sciences overlap one another; therefore, consensus-building has grown in importance as the sciences themselves have grown (Beck, 1985).

The intellectual form of scientific knowledge is determined by the absolute need for the
scientist to communicate his findings and to make them acceptable to other people. The internal social relations of the scientific community are therefore all-important. (qtd. in Beck, 1985, p. 1)

Perhaps if Galileo had spent more time building consensus before announcing his heliocentric verification of the Copernican theory, he might have had a less conflicted experience. Similarly, after decades of deliberations support for environmental determinism eventually waned before being disregarded altogether by the bulk of the geographic community. Lacking consensus, environmental determinism could have no official existence, and Ziman’s thesis that “[t]here seem[ed] to be room in the scientific psyche for only one dominant paradigm at a time (qtd. in Beck, 1985, p. 26). Inevitably, the controversy was about who defines what knowledge is, or what science consists of, and the mercurial attention span of academic communities and, “consensus on public knowledge” (Beck, 1985, p. 26).

One of the most significant critics of environmental determinism was Sauer, who like Semple, taught at the University of Chicago. After he began working at the University of California at Berkeley (1923), his most enduring critical analysis was published. In *The Morphology of Landscape*, (1925) Sauer condemned environmental determinism as a mechanistic approach that presumed that the environmental exerted measurable dominion over humankind. He noted that the earliest term was “environmental control,” succeeded by “response,” “influence,” “adjustment,” and other such terms that only substitute a more cautious term for the ringing declaration of control that was emphatically stated at the outset (Beck, 1985, p. 17).

Environmental determinism played an integral part in the emergence of geography as a social science during the first decades of the century and this was especially true regarding the
development of human geography as a social science. In fact, even Sauer viewed the emergence of human geography as essentially synonymous with environmental determinism, which was understandable in view of Semple’s definition of geography as “the study of the land [and] its effect upon its people” (Beck, 1985, p. 38). It appeared that:

Environmental determinism grew out of early American geography’s focus on physical environment – this [reflects] geography’s early association with geology in the universities. A theory of causal relationships seemed to dovetail with the accepted Darwinian and Newtonian inheritance in the early twentieth century. Whatever name it was given – environmental determinism, geographical determinism, environmentalism – it was generally concerned with the influences that physical environment exerted, in whatever degree, over human activity and culture. (Beck, 1985, p. 18)

Further, the environmentalism paradigm that:

Emphasizes an essential harmony and unity between man and nature is now seen as “casting societal mankind in too subordinate and inefficient a role” and thus has given way to schools which see human agency as having a greater effect. (Gregory, 1981, p. 107)

Because the scientific method worked so well for the physical sciences, it was natural to assume that it would apply to human geography as well as the other emerging social sciences, such as anthropology, sociology, and ethnology. Those disciplines gained credibility and acceptance into the curricula of higher education. Unfortunately, in the ensuing rush to apply scientific methods to social studies, environmental determinism presented something of a slippery slope to which the application of traditional scientific methods was sometimes less than successful. These and other criticisms were most notably voiced by Sauer, who disapproved (Beck, 1985) but did not disprove the impact of environmental determinism. Though critical of the idea, he also said that geography was:

The study of things associated in area on earth’s surface . . . [and] the design of the landscape includes (1) the features of the natural area and (2) the forms superimposed on the physical landscape by the activities of man, the cultural landscape. Man is the latest
agent in fashioning of the landscape. The study of geography begins therefore with physical geography [and] the development of the cultural out of the natural landscape. (James, & Martin, 1981, p. 321)

Inevitably, abuses occurred during the first half of the 20th century; however, they eventually produced professional associations that established systems of review and standards of practice. Before the self-regulating organizations (SROs) began to exert their influence and before federal laws gave them more teeth, there were abuses of enormous proportions. One source of evidence lay in the realm of popular culture, as Hollywood provided some small glimpses into the reality of the horror with some gothic movies that depicted a kind of science demonized by the ends that were used to justify any methods in which mad scientists typically working in isolated old mansions and castles conducted despicable experiments on human victims.

East Tennessee Normal School

East Tennessee State University had a number of different names. At its founding in 1911, it was known as East Tennessee Normal School and during the decade prior to World War II, it was renamed East Tennessee State Teacher's College (1925). In 1935, it became State Teachers College at Johnson City. In 1943, it became East Tennessee State College and, finally, in 1963, it became East Tennessee State University. Almost from the beginning, in 1911, Ina Yoakley served as professor of geography and as the Dean of Women until her retirement in 1940 (Yoakley, ETSU Archives, 1911-1998). During her years as an instructor at the college, she dominated geography as it developed into a staple of the curriculum. Yoakley was also an ardent supporter of environmental determinism and a close friend of Ellen Churchill Semple.

According to Robert Peplies, Professor Emeritus of Geography at East Tennessee State
University, Yoakley was a major, “influence on generations of geography students” who dispersed far and wide from the East Tennessee region during the 1940s and 1950s. Peplies noted that East Tennessee State University had a special connection to environmental determinism because of the work of Semple and her influence on Yoakley. Semple was America’s premier environmental determinist from the late 19th Century and the person who first introduced environmental determinism to the United States in 1904. She was scheduled to speak at East Tennessee in 1932 but, unfortunately, Semple died enroute (Peplies interviews, 1997-2003).

**Possibilism**

The concept of possibilism was first coined and described by Paul de la Bache (1845-1918), who tried to revise the geography taught in France to be more interactive with other disciplines. He was an eclectic scholar whose education began with ancient history, classical literature, and Greek geography, followed by studies in archeology. As chair of geography at the Sorbonne, he was fascinated with the close connection between humankind and the inhabited environment. While he recognized that connections existed, he developed a refutation of environmental determinism, which he published a critique on the work, *Annales de géographie* (1899). In the work, he “formulated the concept of Possibilism” (James & Martin, 1981, p. 190). As nature set limits, it also offered possibilities for human settlement, and “the way man reacts or adjusts to these given conditions depends on his own traditional way of living” (James & Martin, p. 190).

The determinist perspective gained a significant boost after the British geologist-tuned-geographer, Griffith Taylor, began teaching at the University of Chicago where he became an eloquent spokesman for what he interchangeably referred to as, “stop-and-go determinism,” or
--scientific determinism” (James & Martin, 1981, p. 260). Taylor noted that:

[The] well endowed parts of the world offer many possibilities for making a living, but in the other nine-tenths of the earth’s land area nature speaks out clearly – this land is too dry, or too cold, or too wet, or too rugged. (qtd. in James & Martin, 1981, p. 260).

Taylor’s historical significance lies not only in his role as a proponent of determinism, but he was also a critical player in the expanding geography as a discipline in higher education. He began lecturing on the relationship between geology, climate, and settlement patterns. In 1920, Taylor was appointed chair of the first department of geography ever founded in Australia. The department he founded at the University of Sydney stood as the only department offering graduate-level degrees in geography in Australia for nearly 30 years. His significance in the field cannot be underestimated (James & Martin, 1981).

While in Australia, Taylor became both an anathema and then a national hero for his accurate assessment of the carrying capacity of the Outback. The government hired him to conduct a study with the anticipation of opening up an interior region to large-scale immigration of a 100 million or more people. Taylor, however, reported that the area could not sustain more than 20 or 30 million at most. His report was at odds with the national policy, and Taylor’s books were banned for a time. He later went to the University of Chicago and then University of Toronto until he retired in 1951. When he went home to retirement, he was hailed as a hero because, as it turned out, his assessment of the Outback had turned out to be correct (James & Martin, 1981).

Even while the tide was turning against determinism, Taylor persevered as a contrary voice in its defense. Still, the consensus shifted as did the paradigms of the majority who settled on agreement that the environment alone could not explain how nature produces the assemblage
of traits that collectively makeup a complex human culture. Accordingly, the major paradigm that enveloped geography was that “humans have the freedom to choose” from among the available elements in the natural environment. Perhaps it is unfortunate, but the freedom of choice argument has cosmological implications, meaning a trap for the classic theology versus Darwin, controversy. Fundamentalism is typically the nemesis of Darwinism as is the teleological perspective that claimed that the human eyeball offered proof that Darwin was wrong because, the eye was thought to be simply too complex to be the result of natural selection (James & Martin, 1981).

One alternative that gained a consensus, was a broad perspective known as “possibilism.” Possibilism was offered as a substitute for environmental determinism in that:

People, not environments, are the dynamic forces of cultural development. The needs, traditions, and level of technology of a culture affect how that culture assesses the possibilities of an area and shape what choices the culture makes regarding them. Each society uses natural resources in accordance with its circumstances. Changes in a group’s technical abilities of objectives bring about changes in its perceptions of the usefulness of the land. Simply put, the impact of the environment appears inversely related to the level of development of a culture, while perception of environmental opportunities increases directly with the growth in economic and cultural development. (Fellman et al. 2007, p. 39)

Developments in the social sciences were accompanied by concerns over good scientific topics and methodology. The budding social sciences striving for growth at the turn of the 20th century lacked historical precedence and were a bit overanxious to embrace a broad array of ideas while lacking much in the way of critical peer review, which made the new field of human geography ripe for controversy. Because the sciences lacked any clear professional standards at the time, the likelihood that dangerous practices might be undertaken in the name of science was all but certain (James & Martin, 1981).
In the difficult decades between the World Wars, environmental determinism became connected with some ambiguous racial issues. An outgrowth of attitudes that stretched back to the colonial era in America, the emergence of natural science discovered some correlations between latitude and ethnographic characteristics that were adopted and used to justify racial prejudice. The conquerors of the new continents naturally viewed themselves superior to the people they overwhelmed. Some Europeans found justification in the fact that since they lived in higher latitudes and most of the conquered people lived in lower latitudes that the physiological origins of people was a critically important in human development. In time, this racially charged belief spawned corollaries, such as the famous Brandt Report that was conducted by a commission appointed by the United Nations. Published in 1991, the commission concluded that the bulk of “less developed countries were located in the lower latitudes” (Fellman et al., 2007, p. 334). Briefly:

The Brandt Report hints at one frequent but simplistic spatial explanation: Development is a characteristic of the rich “North – and mid-latitudes,” more precisely; poverty and underdevelopment are tropical conditions. Proponents of the latitudinal explanation support their conviction by noting that rich countries – some thirty in number – have 93% of their population residing in temperate or “snow belt” zones; forty-two of the world’s poorest states have 56% of their people in tropical latitudes and 18% in arid zones. (Fellman et al., 2007, p. 334)

This report had the potential to exacerbate misunderstanding and prejudice unless the underlying factors were considered. Widespread ignorance of those factors contributed to some negative stereotypes and prejudice regarding the people who inhabited equatorial regions. Subsequently, the typical stereotype was framed, “people who live in tropical climates are all lazy.” Hidden in such an overly generalized assessment were some causal factors that some might point to as examples of environmental controls. Exceptions cloud the picture further and
lead to conclusions being drawn that were misleading regarding people and poverty as a function of latitude (Fellman et al., 2007).

Among the exceptions to the conclusions of the Brandt Report were North Korea, Afghanistan, Bangladesh, Myanmar, and areas of Eastern Europe, the Balkans, and the Caucasus, impoverished nation-states that happened to occupy regions of the reportedly prosperous upper latitudes. Similarly, there were exceptions to the Brandt Report in the lower regions; nonetheless, blanket assumptions were conveyed by an officially sanctioned study commissioned by a respected international organization. However, did the exceptions mean that the conclusions of the Brandt Report were simply wrong? Certainly not; yet, it should emphasize that exceptions are not atypical of any data that might point to certain conclusions. In other words, in the best of cases, conclusive evidence might be anything more than 50% of the supporting data, while ignoring that the other half points in another direction. The early environmental determinists like Ellen Churchill Semple and Friedrich Ratzel never “supposed that the natural environment was all determinant” (Hartshorne, 1966, p. 56) as was alluded to by their critics (Fellman et al., 2007).

One problem with making assumptions about people living in a particular region of the earth is the propensity for easy stereotypes. The soils found in the tropical rainforest regions were actually quite infertile and virtually useless for development of commercial agriculture. Nonetheless, in many regions of the Amazon basin droves of indigent settlers adopted the practice of slash and burn cultivation that permitted opening new settlements on the millions of miles of lands in a manner that has been similar to the settlement of the Western United States where the environment was tied to the idea of Manifest Destiny (Fellman et al., 2007).

This is an ancient and destructive style of agriculture that is also known as swidden, an
old Saxon word that destroyed the rainforests to produce some fertile potash that permits planting domestic crops for a few seasons before being depleted again. Still, at best it is a marginal-subsistence economy that has contributed to an expanding environmental catastrophe that is culturally relevant and unlikely to end before an environment is completely altered. Evidence of past cultures destruction is evidenced in modern Lebanon where the legendary Cedars of Lebanon had once stood. Because the trees were exterminated centuries ago, the top soils eroded away and contemporary efforts to replant trees on the barren hills have produced less than stellar results (Fellman et al., 2007).

Any nutrients in the soils of landscapes from which trees are removed are quickly eroded away making reforestation very difficult. In the tropics the problem of tree removal is a double crisis because tropical soils are generally quite infertile from the start. Subsequently, a type of shifting agriculture has grown up around the Amazon region in which trees are cut, debris is chopped up, and then burned to produce enough potash to grow crops for a couple of years. The Anglo-Saxon word *swidden*, applies to this destructive practice which is an indication of its ancient roots as a subsistence lifestyle (Fellman et al., 2007). It is perhaps more widespread today than at anytime in the past, especially in:

The hot humid climates of the tropics [that] produce soils called *laterites* . . . [because] chemical weathering is intense under such climatic conditions, these soils are subjected to great quantities of percolating water . . . that removes the soluble materials. (Tarbuck & Lutgens, 1988, p. 51)

Once the tropical soils were completely leached, what remained were oxides of iron or aluminum which become very hard when dried and without humus, laterite could hold little or no water making it unfit for growing crops. It has been noted that –The infertility of these soils has been borne out repeatedly in tropical countries where cultivation has been expanded into such
areas” (Tarbuck & Lutgens, 1988, p. 52).

In contrast to the soil development that might occur in other regions, the organic material accumulating on the floor of a tropical jungle quickly decomposed and was reabsorbed by the voracious growth of the vegetation. The dearth of soil fertility tropical regions has translated into a marginal cultivation systems and subsequent cultural traits in which farmers assist each other to open up areas by “slash-and-burn” (Fellmann et al., 2007, p. 261) a technique which is followed by ranchers who plant grasses and cattle keep the forests from returning. Swidden techniques require that enormous amounts of vegetation be cut, chopped, dried, and then burned in order to provide a blanket of potash that enriches the soil enough for no more than 3 years of crop production. Shifting agriculture using slash-and-burn techniques has been a widespread practice around the world that has left a legacy of barren deforested landscapes in regions that were once characterized by extensive forests. Today, more than half the world’s population is tied to traditional agricultural methods that destroy forest biomes and that provide barely more than subsistence-level lifestyles (Fellman et al.).

In addition to marginal farming practices, another environmental factor has characterized many tropical regions. This issue was associated with climates that tend to be quite hot and humid and tend to suppress human activity. These two factors intersected to foster cultures characterized by poverty and lethargy. Did the environment direct human behavior? Yes and no. According to Hartshorne (1966), “The earth features, are neither purely human nor purely natural, but composite in character” (p. 54). A consequence of several natural features related to climate developed contempt heaped on inhabitants of the tropics by those living in more invigorating climates of the higher latitudes. Unfortunately, and undeservedly, those critical assessments were attributed to inherent genetic characteristics of the peoples themselves. Taken
together, these examples relied on both the Social Darwinism of Spencer and the environmental
determinism of Ratzel to lend credence to prejudicial beliefs and attitudes about people.
Throughout history, partial truths caused enormous social injury unlike that of whole truths,
which rarely caused any damage (Hartshorne, 1966).

Separating truth from fiction could be difficult, if not impossible. However, some of the
most egregious issues attached to environmental determinism arose when well-positioned,
educated individuals made declarations based upon a priori assumptions. James Watson,
recipient of the Nobel Prize in 1962 for his role in discovering the double helix in DNA,
commented to a British newspaper reporter that he was inherently gloomy about the prospects
for Africa [because] all our social policies are based on the fact that their intelligence is the same
as ours – whereas all the testing says not really” (CNN.com). According to a CNN report citing
the Sunday London Times report, Watson said, “There was no reason to think that races, which
had grown up in separate geographical locations should have evolved identically” (CNN.com).
Environmental determinism was simply one of the more recent examples of a scientific system
used to justify personal beliefs, prejudice, social inequality, and the inhumane treatment of
certain classes of human beings. Teachers, researchers, scholars, and everyone involved in
education should gain a thorough understanding of how even good ideas could be twisted to
support wrong or unfair assumptions.

Post-positivism in the social sciences has been described as a deterministic philosophy
that is applied to the social sciences where patterns of behavior can produce good data that can
be given discrete values to certain types of behavior, actions, or interactions. The key to the
positivistic approaches is that opportunity to reveal cause-effect relationships that are the point of
most scientific inquiry. With social phenomena, it is necessary to conduct many observations
over specific time frames to produce the best data from which conclusions may be inferred. Quantity of data is of greater concern in the social sciences while duplication of outcomes is most important for the physical sciences. Therefore, the rule of thumb for social phenomena is the larger the number of observations the better results (Creswell, 2003).

Another issue is that of confidence in the methodology used to obtain the data. Among social phenomena it is a bit like the issue of venue that attends a highly publicized murder trial in which everyone has formed an opinion and impartial jurors are needed. Participant-observers face major obstacles to separating their own inherent innate biases from the data being studied if neutrality is intended (Creswell, 2003). Cultural biases are among the most difficult problems for cultural studies and, like environmental determinism, involve cultural understandings that are so ingrained as to suggest that genetics may even play a role. Could the so-called, social gene, be at work in such cases? This may be a topic for another study.

One of the most common biases that has been identified at the crux of the Euro-centrism that has been noted earlier as problematic. It is the worldview that holds that the civilized world is somehow superior to the less developed regions of the earth. Such an urban-biased view of the more-developed world has generally assumed advantages better food and healthier lifestyles than are available to those living in poor nations. Such observers have generally based such interpretation upon assumptions about happiness as a product of material benefits and good health. In reality, there is much more to happiness than wealth. Yet, this assumption about the source of well-being has not held up in the face of empirical studies. Among such, Diamond’s research revealed that, in most cases, primitive people were actually happier than the average counterpart in the civilized world (Diamond, 1999).

The modern media promotes the wrong assumptions because they are stories and reports
that highlight the dangers associated with life in less developed countries. On the other hand, there are frequent stories about “the good life” associated with contemporary Western Civilization. The truth is that life in the West includes high levels of psychological stress that contribute to drug and alcohol problems as well as emotional disorders and social-psychological pathologies. While health is almost a national obsession in the United States, the evidence seems to suggest otherwise (Diamond, 1999).

In short, civilization has failed to demonstrate any greater happiness than primitive cultures. Highly-developed, fast-paced urbanized societies have produced extraordinary rates of high-blood pressure, obesity, depression, and other issues correlated with the benefits of civilization. Furthermore, the highly-developed cultures have been consistently plagued by high divorce rates, domestic violence, and suicides, issues that are exacerbated by extended families that have typically become distanced from one another. The family has been at the heart of the traditional support system has been viewed by some researchers as further evidence of social disintegration lending to cultural environments of stress. These issues beg the question: Could it be that the cultural environments associated with primitive, hunter-gatherer societies might be the healthier way of life? (Diamond, 1999).

According to Diamond (1999), the more primitive world produces cultures that are characterized by far fewer psychological conflicts, heart attacks, nervous disorders, and on, and on. Yet, in spite of the literature that suggests that the so-called benefits of civilization are problematic for major portions of the population in terms of heart disease or other psycho-stress-related maladies. The issues associated with “the good life,” may have a corollary with the suggestion of possible lead poisoning that been suggested as a possible cause of the downfall of the Roman Empire as the wealthy were imagined to have suffered from poisoning from use of
their own lead water pipes and lead containers that may have induced brain damage, and by inference, may also have contributed to the demise of the Roman Empire (Lewis, 1985).

The Romans were aware that lead could cause serious health problems, even madness and death. However, they were so fond of its diverse uses that they minimized the hazards it posed. Romans of yesteryear, like Americans of today, equated limited exposure to lead with limited risk. (Lewis, 1985, n.p.)

Whether or not lead was the cause of the demise of Rome is food for debate; however, there have been more recent claims about copper pipes that are found in wealthier housing that has a level of toxicity for some people. Similarly, a recent connection has been theorized that only a small percentage of humans are afflicted with brain tumors and likewise similarly small numbers of people have the human papilloma virus. The speculation has it that there may be connection between the wealthy and the associated tendency that they live in far more hygienic environments than is true of the less affluent sectors of society. Known as the “hygiene hypothesis” (p. 21), it is an idea that has been suggested responsible for the rise of allergies founded on the idea that, according to Charles Cobb, neurosurgeon at the University of California—when people grow up in antiseptic super clean environments, their immune system does not mature properly” (as cited in Wenner, 2009, p.21).

The debate over the role of the environment in human affairs relies on the community of scholars who collectively decide what issues are worthy of debate. While there has been good reason for some or much of the criticism of environmental determinism because it has been shown to be fraught with pitfalls. Still, certain aspects seem to keep the debate focused on any positive applications. For example, one of the less savory issues associated with environmental determinism has been its association with racism. The following is a portion of an interview that occurred a couple of years ago with the curator of a diorama of human origins that attracted
some critical attention at the American Museum of Natural History:

Glausiusz: I was told that some people considered the dioramas in the old hall racist, because as the humans represented there evolved, their skin became lighter.

Tattersal: I think you always get some grumblings, but that particular complaint is based on a total misapprehension of the evolutionary process. We have tropical origins as a species, and if you are a hairless creature in a tropical environment, it is not a good idea to have light skin---due to the amount of ultraviolet radiation you are being subjected to. Generally speaking, you only find the very light-skinned populations in temperate latitudes, so it doesn’t really make much sense to suppose that our tropical ancestors out of Africa had anything but darker skins. It’s got nothing to do with any racist argument at all. The Neanderthals, who became extinct a little less than 30,000 years ago, adapted to colder climates, and are believed to have had lighter skin. It’s not as if we’re saying that primitive people had darker skins than advanced people; we were making no kind of political statement with the (earlier) dioramas. (Glausiusz, 2007)

Contributing to the power of environmental determinism was that alternative scientific perspectives attempted to replace it. Principally, *possibilism* and *probabilism* failed to spur much interest among mainstream society because they were overly generalized. However, positivists tried to remove the idea of environmental controls from these subsequent theoretical perspectives by stressing the significance of “human freedom to pick and choose from among the possibilities presented in the environment” (Lethwaite, 1966, p. 2). The critical issue for both possibilism and probabilism was that factors or choices had “either a moderate degree of probability or the barest chance within the limits of circumstances” (Lethwaite, 1966, p. 2). Because this definition was so broad that it was almost useless, the response was that the academic community shifted to cultural determinism because the culture assumed the overarching structure controlling human activities.

The concern in some quarters was that environmental determinism was much more than a harmless ideology. Instead, it became clear in time that determinism contained a surreptitious suggestion of racism, an element that made it an appealing ideology to those who were so
predisposed. Further, that such a seemingly scientific theory can be so easily perverted may lure
the unwary researcher into an untenable or teleological position that has no place in an empirical
investigation. Ostensibly this is exactly what occurred during the colonial era. Europeans felt
justified in their Euro-centrism. After all, Europeans had conquered and colonized landscapes
around the world and became one of the richest, most advanced regions on earth – such
credentials stood as proof of their sense of superiority and undaunted hubris (Diamond, 1999).

Environmental determinism was redefined, refined, reviewed, and redirected, but never
completely dislodged. However, successful adaptation to environmental conditions could be
attributed to pure luck of location rather than superior intellect. Diamond (1999), professor of
geography at UCLA and author of, *Guns, Germs, and Steel*, argued persuasively for a continued
analysis of all avenues of human development. The suggestion was that, like other perspectives,
environmental determinism had its place and should not be dismissed too quickly. Diamond
addressed the Eurocentric perspective that was a dominant view among a majority of scholars in
the past. According to Diamond, instead of inherent biological superiority, Europeans were the
fortunate inheritors of various immunological and technological advantages that gave them an
enormous economic head start on the rest of the world. Further, those advantages led to the
Industrial Revolution that left the remainder of the world trying to play catch-up (Diamond,
1999).

A version of the creation myth was reinvigorated by Wetherill (2006), who taught the
gospel of rational living, in which he preached that achieving psychological well-being required
living in harmony with nature. In his view, the Biblical creation story was less about religion and
more about providing an outline for achieving balance and happiness and adherence to living in
compliance with human nature that was derived from nature. Wetherill referred to human nature
as *behavioral law* and *social law*. He pointed out that nature’s behavioral and social structure was the foundation of society, yet had not received much attention from the public because natural, rational social action was not newsworthy while irrational human activities in business and everyday life have dominated the news. Add the tendency toward ethnocentrism and:

In forming judgments, people elevate their own opinions above the authority of nature’s social law. The Creator, whoever or whatever, is responsible for what exists, created a world controlled by natural laws. Over the centuries, people unknowingly have ignored the social law and have been ruling their actions by the “divine right” of their judgments. (Wetherill, 2006)

Wetherill died in 1989, but his ideas on rational living continued to be expounded through reprintings of his books and lectures published by the Alpha Publishing House. According to the most recent reprint (2006) by Alpha Company, Bothe admitted that there was no scientific research on the law of natural behavior. However, it reflected instead a grassroots movement founded on application of intuitive reasoning for living a logically appropriate life (Bothe, 2006). The influence of Buddhism on Wetherill was undeniable and, like Buddha, he too received his inspiration while meditating on the nature of things while sitting under a tree.

Diamond (1999) noted that by putting Western ethnocentric racism aside, a good argument could be made that so-called Stone Age people were much more intelligent than the average person living in Western culture. His analysis arguably made a case for environmental or cultural determinism by noting,

In the average American household, the TV set is on for seven hours per day. In contrast, traditional New Guinea children have virtually no such opportunities for passive entertainment and instead spend almost all of their waking hours actively doing something, such as talking or playing with other children or adults. Almost all studies of child development emphasize the role of childhood stimulation and activity in promoting mental development, and stress the irreversible mental stunting associated with reduced childhood stimulation. (Diamond, 1999, p. 21)
Many of the characteristics that defined civilization were often the same factors that illustrated the weaknesses of civilization. For example, the so-called superior social systems could not be shown to produce people who were happier. In fact, diseases such as depression, high blood pressure, and other stress-related ailments were virtually nonexistent among more primitive societies. Additionally, the typical American family today is under enormous stress due to divorce, drugs, alcohol, physical and psychological abuse, single-parent households, and poverty. On the other hand, primitive tribal cultures were generally described as having strong social support systems because of their large extended families and friendships. By eliminating all ethnocentric criteria before comparing civilized and primitive societies, the unexpected question arose as to whether or not civilizations were actually superior. According to Diamond (1999), the only difference between civilized people and those considered primitive was a matter of a few minor tools, knowledge of their use, and resistance to certain diseases.

Is it fair to call people who generally live in balance with their environment “primitive”? Such comments suggested that the speaker had little knowledge regarding the scholarly debates that raged nearly a century ago. However, determinist ideas were often expressed without knowing anything about determinism. Often, such comments suggested teleological arguments of ultimate ends and investigators might be unable to pursue further objective research. If everything fell in line with natural causes, humans might be merely automatons. How might empirical research deal with these teleological questions? These can be compared to a computer do-loop in which the issue is circular, endless, and unanswerable.

Even a great mind such as Einstein’s sought natural conclusions to universal questions. His well-known desire to uncover a unified theory of the universe proved illusive, however, according to an article by Green (2007), titled “A Theory of Everything” noted that:
In Einstein’s day, the strong and weak forces had not yet been discovered, but he found the existence of even two distinct forces – gravity and electromagnetism – deeply troubling. Einstein did not accept that nature is founded on such an extravagant design. This launched his 30-year voyage in search of the so-called unified field theory that he hoped would show that these two forces are really manifestations of one grand underlying principle. This quixotic quest isolated Einstein from the mainstream of physics, which, understandably, was far more excited about delving into the newly emerging framework of quantum mechanics. He wrote to a friend in the early 1940s, “I have become a lonely old chap who is mainly known because he doesn’t wear socks and who is exhibited as a curiosity on special occasions.” (Greene, 2007, n.p.)

Or, perhaps Einstein was simply ahead of his time when:

More than half a century later, his dream of a unified theory has become the Holy Grail of modern physics. And a sizeable part of the physics and mathematics community is becoming increasingly convinced that string theory may provide the answer. From one principle – that everything at its most microscopic level consists of combinations of vibrating strands – string theory provides a single explanatory framework capable of encompassing all forces and all matter. (Greene, 2007, n.p.)

In the modern era, the overriding question was why debate and controversy over environmental determinism periodically returned to stir up geographers and nongeographers alike. This research addressed these phenomena and asked essential questions to gain an understanding of the power of this presumably defunct theory that simply would not die.

Summary

Environmental determinism was an ideology that suggested that it made sense to view all human activities as adhering to natural laws. And, if that were true, human social structures and activities could be explained with empirical scientific methods. Unfortunately, applying such methodologies to the studies of humans proved to be a slippery slope because treating humans like lab rats was dehumanizing and inevitably brought ethics to the forefront of studies of human social behavior. Clearly, the dehumanization of human subjects for the sake of science was of little concern to the notorious experiments conducted by Hitler’s Nazi regime during the 1930s.
and 1940s.

The growth of the social sciences during the 20th century was marked by many instances of spurious and dangerous scientific ideas that proceeded unabated for decades due to lack of peer review institutional oversight. However, few ideologies had the longevity of environmental determinism, which persevered long after the scientific community turned its collective back on it. Some of the strongest arguments in favor of environmental causation emerged after World War II when neo-Malthusian researchers argued that the physiological density of the earth was approaching as populations rates began to soar. But were these simply expressions of expectations in search of a cause? Perhaps it was as Harvey (1974) pointed out, “science cannot be ideologically-free” (p. 156). Rather, “The adoption of certain kinds of scientific methods inevitably leads to certain kinds of substantive conclusions which, in turn, can have profound political implications” (qtd. in Beck, 1985, p. 156). Freeman (1980) addressed these two extremes of plural methodologies within the discipline of geography. “On the one hand, there are people [who are] dazzled by the endless hopes of human conquest of adverse and difficult environments and, on the other hand, there are those who find everything predetermined by physical factors beyond human control” (qtd. in Beck, 1985, p. 156).

By the end of the 1930s, most geographers had dismissed environmental determinism as a dead end investigation too mechanistic to be useful in the study of human behavior. Nonetheless, scholarly criticism and exceptions continued to be debated in academic journals throughout subsequent decades for the remainder of the century. It was especially important to the so-called second-generation geographers to replace environmental determinism as explanations for the variable patterns of human activities found in comparable but different locations. Among the most prominent of those new perspectives were possibilism and
probabilism, each of which presumed that humans were free agents who made choices from the innumerable factors available in the environment (Hartshorne, 1966).

Why, after years of scientific criticism thought to have eliminated environmental determinism as a viable scientific perspective, did it appear to live on? It was a question not easily answered. It might be that the alternatives to environmental determinism turned out to be less than satisfactory. Simply put, the answers were not discovered to questions of why humans apparently displayed patterns of physical and cultural differentiation that varied from one region to another or why some kinds of characteristics appeared to be distinctly related to the environment. Studies in genetics, chaos theory, and other theories and fields of study may have granted some degree of credibility to environmental perspective. The idea of environmental causation simply may have proved too seductive to resist scientific findings to the contrary.

Carter (1964) noted in *Man and Land: a Cultural Geography* that:

> Although geographers have now turned from environmentalism to a more balanced view, allied fields of knowledge are all too often still following along in the deterministic paths marked out fifty years ago. When history, economics, and political science, even on the college level, refer to geographic factors, all too often they take a strongly physical environmental deterministic view. In lower level schools, one seldom meets anything but determinism. (p. 12)

The persistence of ideologies underlying environmental determinism revealed a power that Italian philosopher Gramsci (1992) termed “cultural hegemony,” in which ideas were accepted by society, regardless of scientific support, because of their economic relevance to human activities (Ozmon, 1999). The history books are strewn with ideas that served societies for a time before being replaced by new paradigms. Yet, the persistence of some ideas might suggest that certain truths existed, at least in the minds of believers and, therefore, played an important role in society. The assessment of ideas had less validity than the power of consensus.
among those who believed in the idea. This was fundamental to science because:

Ideas aren’t part of science until they have been published in the reputable journals. Nor are these ideas random or unconstrained. This public record in the journals is highly monitored by respected members of the community. An article in a reputable journal does not merely represent the opinions of its author; it bears the imprimatur of scientific authenticity, as given to it by the editors. (Ziman, qtd. in Beck, 1985, p. 4)

And, further that:

Some might object to the study of environmental determinism within the academic journals on two accounts: it is too “small” a topic; it is too “inbred” to study the discipline talking to itself.” [However], there are no “small topics” in the history of any discipline: all illuminate its evolution. And, no school of thought who has provoked so much venom as environmental determinism has could be “small.” (Beck, 1985, p. 4)

An example of groupthink that defied objective criteria was the belief in interstellar aliens that persisted despite scientific evidence to the contrary. The belief that Martians might be somehow hidden from view was exemplified by the continued popularity of H. G. Wells’ War of the Worlds (1898), which has never been out of print since it was first introduced over a century ago. Likewise, the belief in UFOs was so common that those who study the phenomena advanced their credibility by referring to themselves as Ufologists. Possibly, beliefs consistent with environmental determinism continued to be as widely accepted as understandable ways of explaining complex and variable factors that underscored various social and cultural phenomena. Although, modern science viewed traditional environmental determinism as overly simplistic, teleological, and even racist, there might be compelling reasons why the public accepted deterministic explanations for complex social phenomena.

The Social Darwinists applied ideas in support of environmental determinism to explain how social problems were the natural outcome of “the grit, grime and crime that characterized the big cities of the Industrial era” Brinkley, 2003, (p. 440). The application of those ideas
replaced the unhealthy ugliness that plagued most of the great cities of the latter 19\textsuperscript{th} century with natural environments to redeem their social evolution and to orchestrate positive social outcomes. Soon, every city in America had city parks to resolve many of the ills of urban society in need of areas of respite from the unnatural conditions that had overtaken them during the industrial era (Brinkley, 2003).

In an attempt to eliminate crime in the early 20\textsuperscript{th} century, social activists brought nature to urbanized humans by establishing parks and playgrounds in every city in America. They contended that every city could and should be remade to reflect the natural environment and the primal origins of human nature. Some cities began to market their new natural characteristics as a means of drawing tax-paying residents and this commercialization of nature became effective entrepreneurial marketing. In the modern era, there are garden cities on the edges of older cities, sprouting a galaxy of escapist opportunities for the new middle class. If a little was good, more must be better. Thus, although they did not resolve social issues, the success of such early movements encouraged more environmental marketing. In fact, environmental perspectives became de rigueur in application to every aspect of urban life.

From the ecological view one can see that, since life is only transmitted by life, then, by living, each one of us is physically linked to the origins of life and thus – literally, not metaphorically – to all life. Moreover, since life originated from matter, then, by living, man is physically united back through the evolution of matter to the primeval planet Earth. (McHarg, 1974, p. 468)

Further, according to urban theorist, McHarg (1974), “Our phenomenal world contains our origins, our history, our milieu; it is our home” (p. 468). It was in this sense that ecology [a Greek term that is derived from \textit{oikos}] was the science of the home and fundamental to the passage of The National Environmental Policy Act of 1969 that stated in part:
The purposes of this Act are: To declare a national policy which will encourage productive and enjoyable harmony between man and his environment; to promote efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of man; to enrich the understanding of the ecological system and natural resources important to the nation. (NEPA, 1969, Sec. 2)

Further, the symbiotic relationship of humankind and nature should be a good thing that would be an integral aspect of the ecological movement, attainable by the coordinated effort of all agencies of the federal government that shall:

(A) Utilize a systematic, interdisciplinary approach which ensures the integrated use of the nature and social sciences and the environmental design arts in planning and in decision-making which may have an impact on man’s environment; and

(B) Identify and develop methods and procedures that will insure that presently unquantified environmental amenities and values may be given appropriate consideration in decision-making along with economic and technical considerations. (NEPA, 1969, Sec. 101)

Among such was the Eugenics movement that, at one time, had the support of many prominent people in the government and higher education. Another was the application of evolutionary thought applied to certain social phenomena such as the so-called-science of phrenology. It was, in reality, no science at all, because the spurious assumptions had virtually no empirical support. Yet, for several decades, it gained preeminence among criminal justice practitioners, especially in Great Britain near the end of the 19th century. It was an outgrowth of some scientific revelations about the human brain as it connected various regions to certain individual behaviors. Before long, specialists in phrenology were practicing their dubious art of examining the skulls of criminals to determine how their shape reflected antisocial behavior. Although extravagant claims were made, little proof was forthcoming; phrenology was discredited and was cast by the wayside of science as an illegitimate field of study (Harkavy, 1994).
As noted above, the academics associated with the outgrowth of the social sciences during the past century were concerned to some degree with attaining credibility and stature among the fields of established curricular studies. It was no surprise that they criticized each other’s methodology according to perceived weaknesses because ideology with semantics problems was suspected of being weak. With that in mind, it was interesting to note that environmental determinism, without being identified as such, recently came under reconsideration in the popular book, *Guns, Germs, and Steel* (1999) by Diamond.

Diamond’s book achieved considerable critical acclaim as one of the alternate choices on the *All-Time Essential Reading List* presented by the editors of *Discover Magazine* (December, 2006). Diamond’s approach focused on just a few variables to account for a much broader range of human behavior. The variables listed in the title offered a limited range of phenomena with which he made a powerful argument for what could be easily described as environmental determinism. Those overarching causal factors, guns, steel, and germs, were combined with certain locales that had the advantage of excellent trade connections and provided the favorable conditions that permitted Europeans to excel and conquer the world through colonialism.

Diamond’s reasoning supported the environmental-based idea that European societies would have languished without access to innovations such as gunpowder, iron, and steel. However, the most important advantage Europeans possessed was an immunological defense gained by long exposure to an array of diseases and plagues that provided some resistance to diseases that would decimate the indigenous tribes of the Americas. How they achieved these advantages was due to the shape and situation of Europe as a great peninsular land area in which bulk of the population lived near or adjacent to bodies of water. Water, the pathway of exchange, facilitated world trade from the earliest times and it brought the innovations that revolutionized
Europeans with the early recognition of natural resources that could transform those innovations into tools of domination (Diamond, 1999).

The scale of Diamond’s arguments was seductive but included the realization that environmental determinants were a phenomenological arena that reminded researchers of their duty to remove themselves from their subjectivity. Instead, it should be recognized that much of the criticism of environmental determinism might have been due, in part, to political and social agendas that emerged with the development of the discipline of human geography. The problem for pioneering human geographers was sensitivity to the belief that blind adherence to environmental determinism led to untenable positions as well as fueling the fire of racism. In this sense, it was believed that Europeans were superior because they excelled in adaptation to their environmental conditions and ability to conquer and control other societies. This ideology was used to justify some quasi-scientific experiments during the past century that were nothing less than cruel applications of prejudicial attitudes on those considered to have lost the development race.

Environmental determinism continued as a mainstream belief among the public, persisting as a type of urban legend. Among everyday people, statements are made that have the caché of an educated explanation for typical human characteristics. For example, one typical urban legend was the idea that skin color was determined by the climate in which one’s ancestors evolved. Such comments were tossed off as though all the arcane knowledge of the whole of the science world was known to everyone. Interestingly, the controversies that surrounded the issues of environmental determinism were primarily inspired by the German geographer Ratzel, but the subsequent arguments occurred almost wholly within the American academic community (Beck, 1985). The British Dictionary of Human Geography (1981) described environmental
determinism as the view that:

The environment controls the course of human action. An interest in the influence of the environment on man can be traced back to classical antiquity and was revived in Western Europe during the Renaissance. It received its modern credentials largely through the influence of Darwin, whose ideas made it inevitable that geographers, along with other scientists, should begin to see in the differentiation of man the operation of natural laws. The formalization of environmental determinism in these terms is frequently attributed to Friedrich Ratzel, yet while his anthropogeography was conceived as a branch of biogeography he nevertheless recognized, like Vidal de la Blache, that man’s role was both “active” and “passive” and his project was neither environmentalism nor naïve. (as cited in Beck, 1985, p. 19)

The issue with environmental determinism was generally about the use of the term determined. American geographers, including Ellen Churchill Semple and Ellsworth Huntington, used the term as if it had a less rigid meaning than it actually had. Huntington allowed for other factors than the environment by stating that environmental factors “be put into context with other factors including those that are purely cultural” (qtd. in Beck, 1985, p. 19). However, this wavering from the true meaning of the concept was one that meant using terms in ways that belied their inherent meaning and, thereby, opened the perspective to derision. In hindsight, Gregory (1982), of the University of Cambridge, UK, noted that the apparent differences between environmental determinism and its competing perspectives of possibilism and probabilism were much less rigid and not nearly so far apart as some critics had claimed (Beck, 1985).

The principal arguments against environmental determinism might have been essentially regarding issues of semantics. In an era in which science was increasingly becoming more precise in its use of language to describe various phenomena, the controversy over environmental determinism was most heated due to various interpretations of determinism. In December 1904, Davis addressed the first meeting of the American Association of Geographers with “An
Inductive Study of the Content of Geography,” in which he stated that geography was the “study of the relationship between inorganic controls and organic responses” (as cited in Beck, 1985, p. 19). As such, it was deemed to degrade the field of geography as a whole, primarily because its proponents tended to avoid strict interpretations of its basic principle of environmental controls (Beck, 1985).

Contemporary scholars generally considered environmental determinism to be a dead subject not likely ever to be seriously reassessed by the scholarly community. However, there was commentary on the subject, especially whenever an event reaffirmed the power of the natural environment over the puny doings of humans. It reminds us that humankind was generally induced to re-engineer, re-adapt, or respond in the aftermath of destructive events in an effort to repair the effects of a destructive natural occurrence brought on by an act of Mother Nature.

Environmental events periodically send the message that human actions were inevitably dwarfed by environmental conditions. When arguments for environmental determinism have been applied to primitive societies like those of New Guinea or the Amazon basin, relationships between certain cultural traits and environmental conditions can be persuasive. However, attempts to apply the principals of environmental controls to highly urbanized contemporary societies have been less than compelling. Whether or not the cultural milieu represents an environment remains unresolved; however, cultural determinism has been described as a controlling or causal concept distinguishing urban environments. Like environmental determinism, it too fails to provide a universal explanation for human behavior.

Couched within the meaning of civilization, there was an assumption that humanity was somehow good if it civilized and that meant the people were more advanced than primitive
people. Meanwhile hunter-gatherer people such as the Kalahari Bushmen or the Amazonian tribes were *primitive* and thus *not civilized* nor advanced. From this understanding, civilized people, because they were more advanced, were also thought to be happier than primitive people and thus it followed that primitive people were miserable. However, in studies of primitive people, they very often happier with a stronger sense of place in society, while civilized people were those with personality disorders, nervous disorders, and social pathologies. Not so with the Bushmen, who spend three to five hours in serious efforts involving survival and the remaining time in happy discussions, games, and singing as presented in the charming film, *The Gods Must Be Crazy* (1975). Further, civilized society largely received the blessings of civilization—from other peoples living elsewhere [that] were then imported to Western Europe” (Diamond, 1999, p. 18) where they became the basic tools of civilization.

What drives people to pragmatism to seek practical ways to improve their lives?
Numerous theories answered the question of what drove people to expand their territories, their technologies, and their understanding of their world. Among folk cultures, a distinct conservatism and adherence to tradition overrode everything else. In such cultures, there was a great fear of change, which could be considered a dangerous threat to their way of life. An example of this kind of tribal conservatism existed among the Australian Aborigines who believed they were living in a past time known as the “Dreamtime of the world’s creation, and not focused on practical ways to improve the present” (Diamond, 1999, p. 251). Others speculated that the tendency for primitive people to myopia caused them to lack interest in empire-building or greed like that which drove Europeans to establish colonies that fed their mercantilist economic systems (Diamond, 1999).

Sauer became the leading figure in opposition to environmental determinism, but Sauer
was not always so emphatic or certain in his disagreement with determinism. In one example, published in the *Geographical Review* of 1916, Sauer wrote that, “in the study of reciprocal relations of man and earth the emphasis is placed rightly on the physical environment as affecting the activities of man” (qtd. in Beck, 1985, p. 63). What is perhaps most important about Sauer’s statement was not that he was supporting environmental determinism but, rather, that he was emphasizing the importance of the physical environment and that it should not be abandoned in the race to replace it with some other paradigm.

Sauer was cognizant of the fact that humankind was a powerful modifier of the environment, which required human adaptation to an environment tailored for human use. The fact that human modifications included so many elements that it was difficult to assess what is natural and what was modified. Consider not just the topography as human-modified environment, but also the introduction of invasive new species of plants and animals, both domesticated and those which have simply accompanied humans in their endless conquest of world and spread of the ecumene – the habitable areas of the earth. For example, how did humans adjust to pests like rats and cockroaches that were introduced to human environments? How could an adequate assessment be made of the physical environment as modified by humans such as overgrazing that intensified desertification or the use of fossil fuels as cause of global warming? It would certainly take an enormous amount of research to analyze the worldwide changes wrought by human activities that changed the lives of humans.

This was a formative, or perhaps reformative, period for geography and it could little afford to be impeded by ongoing controversy over semantics that made scholars look foolish. Finally, the professional journals curtailed the inclusion of arguments because it became increasingly clear that both Huntington and Semple were really in agreement with their
antagonists because no determinists ever simply stated that humans did not have the ability to choose from among the alternatives offered in the environment” (James & Martin, 1981, p. 324). Nor was there ever any significant argument that no other factors were at play in the development of human societies. In fact, no interpretation in the history of geography ever came close to the “rigorous environmental determinism” (Beck, 1985, p. 19).
CHAPTER 3
RESEARCH METHODOLOGY

*Ab actu ad posse valet illatio* (Lat. – it is possible to infer the future from the past)

**Introduction**

New ideas are not always received well and it the fortunate hero who has the good fortune to bask in the glory of his great discovery. Continental Drift theory which was proposed by Alfred Wegener in 1915, for example, and was essentially snubbed by the scholarly community of the day, only to be lauded and adopted in the post WWII years by a new title – plate tectonics – long after he was dead (James & Martin, 1981). In other cases, ideas may have an indefinably daunting character that acts as "a barrier of the mind" (p. 166) beyond which fear of environmental consequences may be so great as to halt all progress (James & Martin).

The infamous Cape Bojador provides an excellent example of how belief in an unwarranted idea stopped all European exploration beyond a certain point on the coast of Africa. The Cape was a jagged shoal that marked a point on the coastline beyond which no mariner before the 15th century had ever dared venture. The vague unknown that lay beyond Cape Bojador presented a fear of that unknown that was only real in the minds of mariners too fearful to test the idea. It was enough to halt any explorations beyond the Cape for centuries (Boorstin, 1983). This example demonstrates that it what people believe about the natural world, rather than what is actually real that may drive historical events.

Conversely, environmental determinism was unique in the world of ideas because it was first widely accepted by the American academic community before their collective attitude began to focus on other areas of interest. Subsequently, environmental determinism ceased to be
discussed in the professional journals. As was suggested by Beck (1985), dropping investigations into environmental determinism may have been a mistake because though imperfect, as many theories are, it was perspective that held some degree of validity that deserved attention. With such divergent views on the matter, the initial purpose for this study to demonstrate whether or not ideas reflecting the central concept of environmental determinism, that nature controls human behaviors, were present in contemporary society. However, the literature and the anecdotal evidence made it clear that proving its existence was unnecessary because confirmation that such beliefs were a ubiquitous feature that could be found everywhere in the popular media, literature, and common everyday conversations.

While ideas reflecting environmental determinism may be a common element of the social fabric, the immensity of the phenomenon rendered it an overwhelming object of a parametric approach. Nonetheless, it was imagined that by soliciting responses to a survey instrument containing a number of statements reflecting environmental determinism would be useful and various methodologies were considered. In one scenario a majority or all positive responses would have been viewed as an affirmation of environmental determinism. However, it was soon clear that there was no reasonable way to attach any significance to data based upon any combination of positive or negative responses.

A survey instrument that could have demonstrated anything worthwhile relative to environmental determinism became increasingly illusory as options were explored. The issue of what comparative data might prove significant was discussed with colleagues with no substantive conclusions. The problem was what could have been concluded by any particular response to a survey question? What two or more samples or cohorts of society was there some significance for comparison? Among the comparisons considered were gender, age, educated
versus uneducated, and so on. Even comparisons of strength of response were considered but again, there was no reasonable significance that could be inferred from any other the potential outcomes. In short, without any significant comparison there was nothing to prove; therefore, the parametric approach was dismissed as moot.

Following these struggles to uncover a methodological approach, the literary research was underway and unconsciously the emphasis shifted toward a qualitative study. However, the original purpose remained the same – to provide some focus for the benefit of educators and others to better understand the potential for misunderstanding that is posed by determinists' beliefs when applied to social phenomena. A review of history reveals that even educated people overlooked obvious ethical issues in the drive to apply scientific methods to the study of humans based upon mechanistic relationships. Finally, the issues associated with environmental determinism were never resolved and, therefore, should continue to be open for discussion lest history repeat itself. Therefore, enlightenment has been the purpose and goal of this study that has necessarily evolved into an extended literature review.

Methodology, Design, and Strategies

The gathering and recording of information relevant to environmental determinism was the primary task and focus of this study. Establishing that environmental determinism was a relevant issue was a priori due to the ubiquitous nature of the matter that in popular jargon is typically cited as nature versus nurture. The literature confirms that there was never any complete consensus or resolution formulated for environmental determinism, instead it was shelved by geographers who simply discontinued any serious discussion of the topic. Nevertheless, the linkage between environmental determinism and certain social pathologies,
including bigotry and racism provided the rationale for revival and reassessment of the topic. The intent that drove the design that emerged was founded on the need to educate scholars and the public to the way in which certain seemingly benevolent beliefs can contribute to the growth and extension of such social pathologies. New scientific-sounding terminologies have taken the place of environmental determinism; however, the associations between environmental causation and human adaptation remain – that human characteristics are adaptable and inheritable.

The issue has warranted investigation and understanding instead of ignorance by ignoring the concept of environmental determinism. Why it became such a “bugaboo” (p. 1) for 20th century geographers, as described by Beck (1985), is no longer the issue. Instead, it has become more about incorporating studies into the origins of human behaviors such as face recognition, altruism, speech, territoriality, and anger. If adaptations to environmental conditions results in behaviors that provide some value to survival, they are worthy of scientific efforts to understand. What must also be understood are the ways in which popular science and scientists could become imbued with their own theoretical realities. As it unfolded in Hitler’s Germany, the extreme danger occurs when scientific theories drove national policies of eugenics. Thus, it is essential to remember historic events for what they can teach us about human nature and nurture. Whether culture rules or the environment rules are inconsequential because the important question is what can be learned and how can it be used to better the world? A review of history was called for and thus understanding was the purpose driving the study.

Baumer (1977) noted that history was not so much about events as most history books have focused on events and immediate causes of those events and less on ideas as causation. Significantly, ideas have a life their own and according to Baumer, it “differs from political, social, or institutional history” (Baumer, 1977, p. 5) in that ideas are completely fluid and may
flow and interact freely with other ideas. Generally speaking, ideas cannot reasonably exist as
 discrete or solitary entities because departmentalized thinking has been identified as a handicap
to the expansion of knowledge. Indeed, ideas can be viewed as gateways and connections that
interact with other ideas and spawn synergistic outcomes. It has been suggested that overly
specialized or departmentalized thinking leads to narrow perspectives that present a major
obstacle to sorting complex issues. Exploring interrelationships among ideas requires flexibility
and provides expanded opportunities for understanding. As such, the more available
perspectives, or tools, the better for understanding social phenomena environmental determinism
(Baumer).

Among the issues that are problematic for research into social phenomena is the
application of strategies to help avoid injection of value-laden criteria. According to Creswell
(2003), the following strategies should be considered when undertaking qualitative research:

1. Recognize value-laden terminology that can inadvertently communicate
   unintended ideas or beliefs.

2. Conduct research in a manner that is objective and fair in both its intent and
   methodologies.

3. Review findings to ferret out those elements that could be interpreted as
   supporting ideological ideas or misinterpretations.

4. Submit findings for collegial review to gain or expand scholarly perspective(s).
   (p. 186-187)

The potential for some ideologies to stray across the boundaries of acceptable research
are carefully monitored in the United States. This is necessary because there remain deeply held
assumptions and attitudes regarding societies, cultures, subcultures, and races that have the
potential to provoke misunderstanding or antagonism. This issue remains of concern despite the
great progress in social justice and understanding achieved in the United States since the Civil Rights movement of the 1950s and 1960s. According to Diamond (1999):

Today, segments of Western society publicly repudiate racism. Yet many, perhaps most Westerners continue to accept racist explanations privately or subconsciously. In Japan, and many other countries, such explanations are still advanced publicly and without apology” (p. 19).

The popularizing of a largely defunct scientific idea would not be a concern except that, in some cases, an idea can inspire unimaginable harm. Although environmental determinism is technically neutral, it has nonetheless been connected to Social Darwinism, Eugenics, phrenology, and racism, to name a few of the less savory pseudo-scientific ideologies that have ranged greatly during the past century. Potential harm can result from beliefs and assumptions regarding physiological and sociological characteristics of people relative to their origins and place of habitation.

Many social issues of the past and present can be traced to misinterpretations and misrepresentations of valid scientific work. Indeed, if legitimate scientific studies were not enough, those sectors of society given to prejudice could always rely on the power and influence of pseudo-sciences, such as phrenology and Eugenics to lend pseudo-scholarly support to their problematic ideologies. In addition to social problems, especially racism, scholars and educational leaders, influenced by faulty thinking, were periodically responsible for dragging good science through the mud. In spite of the dangers, reputable scientists and educated people periodically make claims that human differences related to the place of human origins. That there are ethnic differences was certain, but when scholars such as Nobel Prize winner, James Watson, who made such claims, it was implied that differences justified unequal social structures, uneven pluralism, misunderstandings, and the inevitable conflict.
It is no accident that the United States is the source of enormous creativity as evidenced by the millions of patent filings per year. It may be inferred that the reasons for such creativity to include the cultural diversity through immigration together with the flexibility of the English language to absorb and grow with the freedom to invent new words are perhaps the most significant factors underlying American creativity. Between human diversity and language it is the freedom to tinker with the language that is likely the most significant. It is with language that dreams and ideas are framed and the creative forces exacerbated by access to the largest lexicon in the world. However, ideas are also subjected to barriers to freedom. This was especially true of the Jim Crow era in American history. It was a dangerous time for African-Americans that were made all the more so because of the Supreme Court decision in *Plessey v. Ferguson* (1896), in which the Court made public policy of a radically-racist ideology. The racial ideology that led to the Court’s decision implied that some people were superior due to naturally endowed traits and, therefore, like the caste system of India, could legally separate those deemed superior by the majority society from those of the inferior caste. The new evolutionary scientific ideas of the day were at least partly responsible for the Court’s decision of which environmental determinism seemed to be on the cutting edge. Science was a wildly popular around the turn of the century and together with social beliefs and political power a powerful feedback loop was established that prevailed until the *Brown v. Board of Education of Topeka Kansas* (1954) began to dismantle the structure of segregation.

It is with the purpose of furthering understanding of the process of ideological perversion that has contributed to social upheaval and the rearrangement of cultural paradigms. The most appropriate methodological approach to the study social phenomena is post-positivism. It is a perspective in the social sciences that challenges the traditional notion of absolute truth or
knowledge [by] recognizing that we cannot be ‘positive’ about claims of knowledge when studying the behavior and actions of humans” (Creswell, 2003, p. 7). Ironically, the approach used to reveal the extent to which society was beguiled by environmental determinism was, in fact, deterministic too. Inasmuch, as latter 20th century social scientists castigated determinism physical scientists embraced it. The goal of determinism, or mechanistic, or positivistic investigation was to reveal patterns of cause and effect from which forecast could be deduced. Accordingly, qualitative studies, as Creswell (2003) indicated have become reliant upon post positivism [that] reflects a deterministic philosophy in which causes probably determine effects or outcomes (Creswell, p. 7, 2003). In short, determinism is a preferred methodological approach to achieve actionable outcomes.

The proponents of Darwinism supported the idea that human evolution was the result of adaptation to dynamic environmental conditions through the process of natural selection in which organisms were exposed to adverse environmental conditions resulting in either adaptation or extinction. Likewise,

human populations repeatedly exposed to a particular pathogen have come to consist of a higher proportion of individuals with those genes for resistance—just because unfortunate individuals without the genes were less likely to survive to pass their genes on. (Diamond, 1999, p. 201)

The essential element of time that helped those with modified genetic makeup cope with environmental conditions through the process of genetic drift eventually produced a –human population [that] as a whole becomes better protected against the pathogen” (Diamond, 1999, p. 201). However, at some stage of human development, social and cultural factors emerged to complicate the whole development process. It was likely the behavioral traits that initially benefited human survival in some manner, the connection with physical survival, became less
apparent as social systems became increasingly more complex. Social systems expressed common experiences and concerns, such as division of labor, practice of war, and respect for death. These were first observed in ancient Paleolithic remains, such as:

The first grave mounds and tombs… [provide] the first hints of civic life, probably well before any permanent village settlement. This was no mere coming together during the mating season, no famished return to a sure source of water or food, no occasional interchange, in some convenient tabooed spot, of amber, salt, jade, or even perhaps shaped tools. Here, in the ceremonial center, was an association dedicated to a life more abundant; not merely an increase of food, but an increase of social enjoyment through the fuller use of symbolized fantasy and art, with a shared vision of a better life, more meaningful as well as esthetically enchanting, such a good life in embryo as Aristotle would one day describe in the “Politics”: the first glimpse of Eutopia. For who can doubt that in the very effort to ensure a more abundant supply of animal food – if that was in fact the magical purpose of painting and rite – the performance of art itself added something just as essential to primitive man’s life as the carnal rewards of the hunt. (Mumford, 1961, p. 8)

Although environmental causation was not always apparent or clearly established, the presumption that human development was primarily a result of natural environmental factors had resolute support among some quarters. Additionally, there was a lack of evidence substantiating anything but the contention that humankind was intimately tied to the earth. Thus, the persistence of determinism was due to assumptions that were ingrained since time immemorial plus, such a belief was useful to society and the social order. As the years passed, however, only anecdotal and inconclusive evidence could be demonstrated and environmental determinism steadily lost its supporters until it virtually disappeared from scholarly debate. Still, determinism played a role in the founding of geography as an important social science in higher education that should not be ignored. The premise here, then, was that environmental determinism was never completely purged. Instead, it continued in the collective mind of the public.

There have been a number of methods developed to the study of social phenomena and
each has strengths and weaknesses that may be unique to a study or relative to the overall methodology. For example, a researcher can only gain a sense of the “lived experience” (p. 15) as Cresswell (2003) termed in his description of phenomenological research. A narrative approach generally involves the collaboration of a willing participant to produce a storyline based on a sequence of events. A sampling of various groups of people can reveal where there are similarities or differences that become the focus of the study. However, there are special problems involved with the study of phenomena of an abstract nature the suggested approach requires the application of more than one approach.

The purpose of this study necessitated a historical perspective in order to gain a sense of the complex array of issues involved that are not obvious to those not familiar with the topic and how it developed into a controversy. A cursory glance cannot begin to reveal the multiple associations that polarized the American geographic community but also produced considerable antipathy and confusion when special cases were cited. Even the strongest critic, Sauer, “did not deny the possibility of environmental determinism in specific cases” (James & Martin, 1981, p. 320); therefore, the topic entailed a combination of history consisting of an extended review of literature combined with personal experience with the topic to provide an essentially narrative approach set down in an order that attempted to make some chronological sense. What then has environmental determinism meant to people in general? Following are typical expressions overheard or found in the popular media.

A number of statements adopted for a potential survey that were believed to approximate the ideas and beliefs suggesting environmental controls. Notably, there are a considerable number of neologisms used in everyday speech that suggest environmental determinism that have been most prevalent in the fields of sociobiology and evolutionary psychology. Regardless
of the terminology, though, it is ultimately adaptation and survival relevant to the natural environment that underlies such emergent disciplines. Therefore, the list that was accumulated for the purposes of the proposed survey instrument remains useful as a way of demonstrating popular beliefs and understandings that are found in contemporary society. Inasmuch, as it has an academic background, environmental determinism was moreover a highly personal belief that suggested religious beliefs such as predestination and a universal design.

The following statements (Table 5) are a selection of examples of concepts that reflect environmental determinism. The statements are typical of the cultural environment interacting with the natural environment. Further, they are samplings of the way ideas relative to cultural ecology, environmental philosophy may be conceptualized. While nature-nurture controversies have generally been futile and frustrating, still they play a role in the human condition. Some humans display more apparent examples such as those whose livelihoods are directly tied to the natural world such as farmers, fishermen, hunter-gatherer societies and those who survive by nomadic herding may be expected to believe in nature as an elemental part of their lives more so than do urbanized people.

Table 5

<table>
<thead>
<tr>
<th>Sample Statements Reflecting Environmental Determinism</th>
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<tbody>
<tr>
<td>1. The scale and type of agricultural production is function of climate conditions</td>
</tr>
<tr>
<td>2. Marginal landscapes produce marginal lifestyles</td>
</tr>
<tr>
<td>3. Folk housing is a reflection of the natural resources at hand</td>
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<tr>
<td>4. Hot climates are characterized by lethargic lifestyles</td>
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<tr>
<td>5. Cool climates produce active lifestyles</td>
</tr>
</tbody>
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Table 5 continued

6. Traditions and other primary sector traits are reflected as cultural substrates
7. Topography determines where human settlements are situated
8. Environmental issues are relevant to certain kinds of human activities
9. Civilizations reflect the degree of independence from nature
10. Cultures are shaped by the climate(s) of their inhabited region
11. The sense of territoriality is instinctual
12. The austere lifestyle of the Puritans was determined by their rocky soils and harsh landscape
13. The highest development of humankind is characterized by urbanization
14. Many admired traits associated with human character such as humility, courage, sincerity, patience, and prudence reflect experience with the natural elements
15. Human evolution is directed by adaptation to the natural world
16. Climate determines housing and clothing types
17. The character of a culture reflects the climate, soils, and rainfall
18. Primitive people adhere most closely to the laws of nature
19. Physiography determines distributions of human populations
20. Humans modify the landscape and the landscape modifies humans
21. Nature versus nurture always begins with nature because there can be no nurture without nature
22. Desert environments were an essential ingredient in the development of the three major monotheistic religions
23. Animistic religions are a way of explaining natural phenomena
24. Natural regions closely correlate with cultural regions.
25. It is through human activities that forests are turned into pasturelands
Table 5 continued

26. It is through human activities that marginal landscapes are turned into deserts

27. Overtaxed environments lead to the fall of civilizations

28. It is impossible to describe or understand primitive cultures without reference to the Environment
CHAPTER 4
AN EXPANDED PERSPECTIVE

Quae sint, quae fuerint, quae mox ventura trahantur (—What is, what was, and what will be”…Virgil)

Man-Land Relationships

This chapter includes a number of scenarios selected as thought-provoking examples of human cultures and associated natural environments. They also provide examples that require consideration of the impacts of environmental conditions from a broad perspective. The enormous range of human activities reflecting the innumerable cultures found around the world suggested the need for a broader perspective on the subject and in order to capture a sense of the whole, a number of scenarios were chosen that may help demonstrate the meaning and purpose of certain cultural traits that appear to have adapted to certain natural conditions. In most cases, there was thought to be some practical purpose for such adaptations, but cultural traits, as expressions of nature, have not always been of a pragmatic response. Some adaptations may be no more than a passing whim that catches on as contagious diffusion takes over. The Hoola Hoop was once a popular toy that caught on despite is simplicity and seeming lack of purpose. To understand adaptation it is incumbent that a definition of environment is established to understand the implications that were ignored by critics of environmental determinism:

The total of circumstances surrounding an organism or group of organisms, specifically:
a. The combination of external or extrinsic physical conditions that affect and influence the growth and development of organisms. b. The complex of social and cultural conditions affecting the nature of an individual or community. (Morris, 1981, p. 438).

The point must be stressed that environment is almost universally defined as the totality of elements that includes the “complex of social and cultural conditions” (p. 438) that, notably
does not specify the natural world but instead identifies the significantly, all-encompassing conceptualization of "physical" surroundings. The cultural environment defined by the built-up physical environment and socio-psychological beliefs and understandings that make of the amalgamation by which humans are conditioned as cultures and societies. The highly urbanized environment has been the driving force in the development of modern civilizations (Morris). The four contemporary civilizations, identified by Arnold Toynbee, are: Western Civilization, based on Christianity; Middle-Eastern/North African Islamic; Indian Hindu; and, Asian Buddhist/Taoist/Confucian (Toynbee, 1947).

The dynamics of city life are reflected in the religious and philosophical beliefs that, together with political and commercial ideologies, produce a composite environment by which culture is known. The belief systems are also expressed in the built-up environment – the architecture the socio-psychological understanding is given physical expression. Subsequently, in the urban atmosphere it is impossible to escape reminders of the sociological facts of life in particular culture. The physical environment is directed and adapted and an environment in itself in which the purpose is primarily a centripetal force that helps tie a culture together. The social-psychological constructs of the built environment include government offices, public and private institutions, schools, public services, and so on.

The overall effect of the culturally-produced physical environment is to employ meaning in every element of structure, to give an impression of long-lasting permanence, trust, and security. The cultural environment goes further than just impressions; it is also an essential influence on the development of individuals and their nature as reflected by in their particular culture. In this chapter a more balanced perspective regarding environmental determinism is proposed in the form of real-world examples in which the environment plays an essential role.
Further, each example is intended to elicit thoughts on how, and to what degree the environmental is a determinant or not. The purpose is to expand understanding of how environmental determinism so easily came to be; and, why it remains a potentially useful paradigm for analysis of humans relative to locational attributes.

Additionally, this chapter provided the opportunity to describe an expanded version of environmental determinism that rests on a broader perspective and meanings implied by the terminology that has been associated with environmental determinism. Each vignette provides a scene and a sense of causation underlying a whole range of interrelated activities. Like an ecosystem, every part is essential to the whole which is the crux of the perspective that is reliant upon causes and effects such as may have been intended by the early proponents like Semple, Davis, and Ratzel. It is unlikely that such thoughtful scholars would have adopted a single causal system for a multi-dimensional phenomenon as culture. The reasoning behind the use of representative scenarios is founded on the following findings and understandings that were gleaned from the study:

1. Never disproved, environmental determinism – nor can it be unilaterally proven
2. The original environmental determinist did not claim that it was the sole causal factor
3. Semantics and definitions were problematic to the life of environmental determinism
4. Depending of the variables, environment, adaptation, and natural selection all play a role in human development
5. Alternatives to environmental determinism have been largely less than satisfactory

**Eurocentrism and Racism**

One of the best-known examples of a physical trait with apparent antecedents in the
environment is skin color. The link between human skin color and climate or latitude has been assumed to be true ever since Herodotus pointed out the apparent connection in the 6th century BCE. In his *Histories*, he noted that the Libyans “are black because of the hot climate” (Herodotus, 2003, p. 103) in which they live. The physiological connection between environment and physiological development gained scientific weight when it was shown there was a direct long-term causal connection between skin color and relative intensity of sunlight. This was responsible, in part, for periodic renewed interest and debate over geographic determinism.

The issue of skin color was fraught with perils due to concerns about Eurocentric-oriented racism. The studies by Diamond (1999), among others, provided ample evidence that the factors that were supposedly responsible for the alleged “Euro-centrism” that assumed European superiority over the indigenous peoples of their far-flung colonies were really matters of pure luck. Instead, Diamond claimed that immunological benefits and the happenstance of excellent resources that were combined with the tools and technology were the key elements that permitted the conquering of vast empires. Diamond’s hypothesis was that there were certain “ultimate causes” that made it possible for “Europeans, rather than Africans or Native Americans … to end up with guns, immunity to the nastiest germs, and steel” (p. 23). His persuasive argument suggested that factors related to the environment such as the situation of Europe as a large peninsula in the middle of the ocean, a temperate climate due to the North Atlantic Drift, and ample resources provide part of the answer as to why Europeans gained an edge in world affairs (Diamond, 1999).

By eliminating the racist connotations associated with some scientific theories, it is possible to embrace a more balanced perspective on the natural differentiation among and between different human populations. For example, the investigations into the evolutionary
processes at work in the differentiation of skin color provided the most recent theoretical evidence that the production of vitamin D relative to sunlight was the key agent involved in the evolution of different skin tones among humans. According to Jablonski’s studies that were reported in the Annual Review of Anthropology (2004), “the darker pigmentation has been shown to better protect the skin from the stronger ultraviolet (UV) light that is prevalent in the tropical latitudes” (Jablonski, 2004, p. 58). In terms of an evolutionary process, natural selection favored those individuals best able to cope with the stronger UV light associated with the low-latitude environments of the tropics. The evidence gathered also shows that pigmented cells in the human epidermis, known as melanin, were not found only in the skin but also naturally occur in other areas of the body including, bile, blood, urine, eyes, and hair. However, it is in the skin cells that melanin appears to have its most dramatic impact because that is where it is synthesized according to conditions in the environment (Boughey, 1971).

The research suggests that melanin is concentrated or dispersed according to a hormone-induced neuroendocrine reflexive process that occurs within skin cells. This process controls how much, or if any, melanin will remain around the nuclear area to protect the nuclei of the cells from the detrimental effects of ultraviolet sunlight. Incoming solar radiation, or insolation as it is known to climatologists, has had a protracted effect upon the natural defense system contained in the skin cells. The result was that pigmentation increased among those populations exposed to higher, more intense amounts of sunlight while in the absence of significant amounts of ultraviolet radiation, a characteristic of the higher latitudes, the melanin contained in the surface molecules dispersed out of the cells and the skin appeared lighter. In either case, natural selection, over thousands of years, favored those best adapted to the prevalent conditions of their habitat according to latitude (Jablonski, 2004).
Elevation and Evolution

A case for evolutionary adaptation can be made for the indigenous peoples living in the high altitude regions of the Andes Mountains of South America. Reportedly, the Quechua-speaking people have long displayed unique adaptations to the physical environment that has evolved into inheritable traits. These successors to the once mighty Inca Empire were mainly found in the high-valley regions, known as altiplanos, where individuals typically displayed physical characteristics, including larger lungs and shorter stouter thighs, than those typically found among humans living in the lowland regions. These adaptations were no doubt enhanced by the Spanish policies that kept indigenous people in place in the high elevation altiplanos.

Theoretically, unique traits developed through the process of genetic drift that has provided the method by which populations of humans came to be characterized by certain unique physical features, often defined by the term race. Genetic drift occurred among isolated populations in which “a chance genetic modification [became] accentuated through inbreeding” (Fellmann et al., 2007, p. 190). If these or similar traits were typical of people living in high elevations, then, theoretically, the Tibetans would also exhibit such traits. Some anecdotal evidence reported by various mountain climbers visiting the region suggested that the Tibetans displayed traits uniquely adapted to living in high elevations.

To consider the total environment, does adjusting the natural environment to suit cultural needs make it part of the cultural or natural environment? Over time, so many adjustments have been to the natural environment by the hand of humankind that it is problematic to ascertain what is really natural in the sense of what has never been adjusted by humans. In turn, once the natural environment is adjusted in some way, the environment influences or determines what opportunities are available for humans to choose. In the physical sciences, the concept of
determinism plays an important role and is subject to considerable open discussion. The physical sciences simply cannot operate unless there are phenomena of cause and effect. Those kinds of two-way interactions also operate in the social sciences; they are just very difficult, if not impossible, to isolate for research purposes.

Obviously, the natural environment plays a powerful role in human activities from great droughts that lasted for decades and affected well-developed cultures, such as the Maya, Pueblo and Ansazi some thousand years ago, and prompted the Norse to go voyaging on warm northern seas in open boats. Between 800-1200 A.D., it was so warm in Europe that fine wines produced in the English Isles and crops were grown at elevations that today were suitable only for short summer grazing (Fagan, 2008). Environmental factors set the parameters within which the events were played out. Difficulties arise in explaining the Norse explorations and settlement without reference to climate conditions that prevailed at the time.

Geographers have continued to investigate the intricate relationships between humans and the environment and like science as a whole, new terms and concepts are proposed to describe those intricacies. Among the most successful was that of Vidal de la Blache, who presented the concept of “possibilism” (James & Martin, 1981, p. 190) in 1899. He claimed the main purpose of human geography was focusing on and revealing, “the close relationship between man his immediate surroundings” (James & Martin, 1981, p. 190). However, as noted in Chapter 2, possibilism referred only to opportunities for choices that potentially could be made; however, it failed to explain or describe specifics about a particular environment critical to humans and to answer why humans choose one particular opportunity over another and integrate it into the social or cultural venue. However, determinism and determinants, such as used in the physical sciences, point to specific elements and characteristics that can be analyzed in terms of
how they meet human needs. And, as adjectives, determinism and determinants are used to describe ingredients that, when added together, shed light on the nature of phenomena. They are concepts that can also describe the circumstances that result in particular outcomes. As such, determinism together with environment is perfectly rational and useful in expanding our understanding of how the natural environment integrates with cultures and social systems.

The teleological implications of environmental determinism and its association with the disreputable Eugenics movement of the 1930s tainted the perspective with the stigma of bad science. It is probably that without such linkages, environmental determinism might have continued to be a subject for scholarly review today. (Hoefer, 2003). Whether or not the terminology was used, environmental determinism was found in both the popular media and professional publications. Descriptions of the philosophy of determinism assumed much deeper meanings in terms of emerging theories such as Chaos Theory that noted:

If the world were governed by strictly deterministic laws, might it still look as though indeterminism reigns? This is one of the difficult questions that chaos theory raises for the epistemology of determinism. A deterministic chaotic system has, roughly speaking, two salient features: (1) the evolution of the system over a long time period effectively mimics a random or stochastic process — it lacks predictability or computability in some appropriate sense; (ii) two systems with nearly identical initial states will have radically divergent future developments, within a finite (and typically, short) time span. We will use “randomness” to denote the first feature, and “sensitive dependence on initial conditions” (SDIC) for the latter. Definitions of chaos may focus on either or both of these properties; Batterman (1993) argues that only (ii) provides an appropriate basis for defining chaotic systems. (Hoefer, 2003, p. 7)

Hoefer (2003) addressed the concept of causal determinism to describe the idea that every event is dependent upon antecedent events and conditions that operate within the boundaries of the laws of nature” (Hoefer, 2003, p. 1). The laws of nature pointed to causes and effects that apply to human activities responding to the dynamic operations of the physical
sciences. However, the idea of human free will has been the fly in the proverbial ointment. How does free will square with the bounded laws of nature? Can both determinism and free will coexist? Some cultures and individuals such as that of Christianized Europe during the Middle Ages were more regimented, more dogmatic, and focused on tradition as their guide to daily living, while other cultures and individuals promoted individuality, inventions, and offered more opportunities and outlets for new ideas that reflected a sense of free will. Ultimately, whether or not humans had any such free will could even be substantiated (Hoeffer, 2003).

The idea of free will was also disastrous for environmental determinism. Ironically, like determinism, whether free will really is an operant factor in human behavior can be endlessly argued but never proven one way or another. While it seemed moot in the early 20th century, unlike arguments over religion, emerging knowledge changed the arena considerably. For example, discoveries in genetics suggested that inheritance played an important role in certain behavioral characteristics that, in turn, translated into social phenomena. Likewise, as scientists increased their understanding of climate patterns, more relationships were implied between human activities such as population growth and human migrations that have played a critical role in shaping human history. Therefore, it would be an unfortunate avenue for any science to close the door on examination simply because it did not meet the criteria of consensus (Hoeffer, 2003).

Sometimes, when ideas were squashed, they produced more damage than if kept in an open forum. History was filled with such ideas that were stamped with disapproval then dragged down the very force that committed them to the grave. Sometimes, ideas were turned around when new evidence emerged. Further, history was marked by cataclysmic events and ideas that changed everything that followed. Frequently, such events seemed no more than happenstance, yet, in hindsight, they were considered turning points. Often, such occurrences were due to
purely natural causes. The Spanish Armada, for example, by far the superior navy, was largely defeated by a climate event that, in turn, forever altered European history as the superpower, Spain, was supplanted by the upstart, Britain. In the big picture, such natural phenomena have been constant agents of change (Diamond, 2005).

The Medieval Warming

Natural forces set the stage for turns of events that were a turning point in for cultures and civilizations around the world. In what was essentially a geological moment in time, the earth climate abruptly warmed in the mid-eighth century and remained in a heated cycle until the latter half of the 13th century. During that era, Europe warmed up considerably and rainfall increased, while in other parts of the world droughts drove migrations of people such as the Mongols. Historical events were largely caused by environmental change. Droughts in the Tropics resulted in the abandonment of Mayan cities and the mysterious disappearance of the Anasazi culture from the Southwestern region of “the four corners” area of the United States where the famous cliff dwellings of Chaco Canyon remain. On the other side of the world, the magnificent city of Angkor Wat was forsaken as a culture withdrew back into nature. Within a few decades, these great cultures were abandoned during a period of environmental instability (Fagan, 2008).

Lasting some 500 years, the Medieval Warming had far-reaching impacts. Perhaps the most deadly event was the conditions were right for the Black Plague. The first decades of the Jubilee Year were characterized by alternate years of floods and then droughts. The onset of the plague years beginning in 1347 was a series of deadly outbreaks that eventually killed nearly half the population of Europe. Unlike the warm period, Europe began to have characteristically cold
winters. The Dutch made the frozen canals the site of a national obsession with ice skating. Meanwhile, the Northern Hemisphere turned much colder through the end of 19th century. The so-called Little Ice Age produced freezing conditions that permitted citizens of Manhattan to walk across the Hudson River to Weehawken (Fagan, 2008).

While some regions suffered from colder, wetter conditions, other areas fell into extended periods of severe drought that lasted for years and even decades. Many climatologists posited that such conditions pushed the Mongols out of the Asian steppes to invade Europe, Southwest Asia, and China, making an indelible mark on world history. Such singular events were just a few of the examples that expressed a simple fact: the natural environment was, and had always been, an essential underlying element within which human activities unfolded. Nonetheless, cultures and civilizations viewed their own existence as special; if proper cosmological balance could be maintained, structures built strong enough, or technology advanced, humans could master their domains. Unfortunately, naturally occurring phenomena periodically reminded human cultures of their fragility (Fagan, 2008).

History, supported by studies in paleontology, archeology, ethnography, and other sciences, generally agreed that the Western Hemisphere was first settled by hunter-gatherer peoples from Asia who happened upon the American continents accidentally while following the great herds of migrating mega fauna during the Pleistocene epoch. Such human migrations were made possible during one or more Ice Ages, when falling sea levels exposed land areas while advances of glacial ice provided accessibility across the Bering Strait. Nearly lost in such a scenario has been the global climate condition that has been characterized by eternal patterns and cycles that prevail human understanding but, nonetheless, impact everyone (Fagan, 2008).

Europeans living in the time before the Medieval Warming (Fagan, 2008) adhered to
strong traditions that dominated agriculture for centuries. However, changes in climate during the 11th century marked a time of great changes in agricultural practices undoubtedly generated by a milder, wetter climate that characterized the whole of Western Europe. Hunting and gathering traditions that preceded the Middle Ages were able to expand in the warm period as evidenced in the *Epic of Beowulf*, first written down from oral tradition by Saxon scribes sometime during the 9th century. An element of the story that could be easily overlooked included references to the practice of fishing and whale hunting that were important to the ancient Scandinavians. The annual migrations of codfish and whales were well known to the Norse hunters who followed their quarry over great distances in open boats. That whales were extremely important in the lives of northern cultures was attested to by the Scandinavians’ use of the term *whale roads* as a synonym for seas in the *Epic of Beowulf*. Further, inference could be made that fishing often led some to venture widely in their efforts to capitalize on the movements of whales and the schooling fish (Bowder, 1982).

Until ancient writers began to record contacts with the Scandinavian cultures, there was little information on how far their voyages may have taken them. *The Anglo-Saxon Chronicles*, a historical record initiated by King Alfred the Great, recorded the first major invasions of England in the late 9th century when Vikings attacked Lindisfarne. That invasion marked the beginning of the Viking Age, which coincided with the Medieval Warm Period that lasted from about 750 CE to 1250 CE. It was during that period of climate change that conditions provided for population growth in Scandinavia that induced migrations including the Viking invasions of Europe and explorations of the western lands of Iceland, Greenland, and North America. While it was generally assumed that the Vikings were warriors because of the havoc that accompanied their hit and run invasions of many European cities, in truth many more were farmers and fishermen.
looking for new lands to homestead. Many thousands of Scandinavians established permanent settlements, intermixed with the existing population, and blended into what would later become England and Scotland (Fagan, 2008).

What role did climate play in the Viking invasions and migrations? The Medieval Warming of Europe included:

milder winters and a longer growing season expanding the production of grain crops throughout much of Scandinavia. Population densities rose, creating land shortages and limiting opportunities for young men. They lived in a volatile society, driven with quarreling, factionalism, and violence. Each summer, young “men” left in their long ships in search of plunder, trade, and adventure. As ice conditions in the north improved and the Arctic pack receded, Norse skippers, long expert coastal navigators, ventured farther offshore, into the North Atlantic. (Fagan, 2008, p. 88)

It was not only the improved climate that permitted the Norsemen to travel great distances. The technology that the Vikings gained through centuries of fishing and whaling led to the development of vessels capable of withstanding the storm-churned seas of the North Atlantic. Among the unique characteristics that made their ships so extraordinary included the ability of the hulls to flex and twist in response to wave action. In contrast to common belief, the Viking ships that eventually sailed great distances across the Atlantic were relatively large trading ships with weatherproofed main decks and large holds capable of storing adequate supplies for long voyages. The long range voyaging ships known as knars were quite unlike the shallow draft warships or long ships that were used to terrorize and plunder the coast and rivers of Europe. Their fishing experience also provided an environment that encouraged advanced food storage, including dried, smoked, and salted codfish, herring and other staples that permitted voyages that could last days, weeks, and even months (Fagan, 2008).

Cold climate conditions dominated northern Europe throughout most of human history.
Additionally, much of Scandinavia was characterized by rugged landscapes and less than ideal soils for agriculture that limited the opportunities for survival much less prosperity. Thus, fishing and hunting provided the best opportunities for survival. However, as the climate began to moderate during the 9th century, agricultural opportunities expanded to include cereal grains requiring longer growing seasons than were hitherto available. The production of grains resulted in better nutrition and larger populations, which produced the long range voyaging that became synonymous with the Vikings. The Viking ships, food preservation techniques, and expanded agriculture were rooted in the prevailing climate conditions (Fagan, 2008).

In addition to shipbuilding, the Vikings also possessed advanced technology with widespread impact that told much about the people they traded with in the Americas. Metallurgy, especially iron making, was perhaps their most important skill, and remnants of the trade in iron were found across the Arctic region from Greenland to the Bering Strait. When the Norseman, Ingólf, first arrived in Iceland in 874, the Arctic ice pack was some 120 miles north of the northernmost shore of Iceland. Today, the icepack extends less than half as far north as it was in the late 9th century. The global warming of today has not reached the limits of warming that existed millennia ago. The Scandinavian colonists combined dairy culture with “inshore cod fishing” (Fagan, 2008, p. 90) as well as growing barley and winter hay fodder. Barley was cultivated in Iceland until the mid-13th century when the climate once again turned cold and not until the 20th century would it be possible to grow cereal grains in Iceland (Fagan, 2008).

In about 985, Erik the Red, exiled from Iceland after some killings resulting from family feuds, sailed west and settled in southern Greenland. There he found better grazing than [in Iceland]. Soon two colonies flourished, one in the sheltered waters of Greenland’s southwestern coast, another farther north in the modern-day Goethe district, at the head of Amarillo Fjord. The settlers found themselves on a coast that was ice free for most of the summer at the time, warmed by the north-flowing Greenland current that hugs the shore. This favorable current carried the colonists’ fishing boats into the fjords and
islands around Disko Bay, to a place that abounded with cod, seals, narwhals, and walrus. Here, in what they called Nordsetur, they collected enough ivory to pay tithes to diocesan authorities in distant Norway for many years. (Fagan, 2008, p. 90)

By sailing only a modest distance into Davis Strait, the Scandinavian colonists could observe the mountains of Baffin Island, or Labrador, or even eastern Newfoundland. When they actually first sighted those landfalls was not known for certain. The first written account was noted by Bjarni Herjólfsson who, after sighting Baffin Island, did not bother to stop. Not long afterward, Leif Eriksson, the son of Erik the Red, sailed the coasts of Labrador, to the mouth of the St. Lawrence River, and then further south to a place he named Vinland, on account of the wild grapes that grew there (Fagan, 2008, p. 91). He founded a settlement now known as L’Anse aux Meadows on a peninsula of Newfoundland. The Norse made use of the profuse timber they found but never expanded their settlement further south due to the ferocity of the natives they encountered. The Vinland Sagas recorded that the Norse used the settlement on Newfoundland as a base for building ships for a number of years (Fagan, 2008).

Further north, the Norse encountered a much friendlier people, the Inuit, a hunting and trading culture that was already well acquainted with iron tools and weapons. Unlike the territorially insulated tribes of the southern regions who were quite hostile to the Vikings, The Inuit were part of a far larger Arctic world, linked by informal trade networks to other hunting groups with common ancestries that extended as far west as the Bering Strait” (Fagan, 2008, p. 2). The trade goods that have been identified as belonging to that period were mainly metals that could be employed in fishing and hunting.

The Arctic region was also home to Tuniit or Dorset people at least as early as 1700 B.C. and like the later Inuit and Eskimos used iron meteorites that could easily be found on the Arctic ice fields across the north. The iron of meteorites was of the purest type and easily forged into
the tools and implements used by the Arctic cultures. The Norse iron was not of the same purity as that of the meteoric iron; thus, archeologists could determine the source of the iron artifacts discovered at various sites. The significance of this point was found in the thousand year old burial site known as Ekven Village on the Bering Sea coast of Chukotka south of Cape Dezhnev (East Cape) in extreme eastern Siberia, the closest point to Alaska, which is readily visible from the shore on a clear day” (Fagan, 2008, p. 96).

Long before Vitus Bering explored the strait that bears his name in 1728, iron objects were being traded across the strait among indigenous peoples and occasionally buried in the graves of important tribal leaders. Some of that iron was of Norse origin, traded through the Arctic network all the way from Greenland. The Norse trade items included every scrap of iron imaginable from iron barrel straps to the nails used in shipbuilding, anything that could be reworked into myriad kinds of tools and weapons in demand by highly advanced hunting societies. It is unknown how much iron came from the eastern sources, including Scandinavia, but it can be surmised from the evidence that significant amounts were traded hand to hand across great distances. The complex trading networks had a long history that predated the Medieval Warm Period; however, during the 9th and 10th centuries the Arctic American trade network expanded to include European trade goods by way of the Vikings (Fagan, 2008).

Without question, correlations could be made between climate and culture. The impact of Scandinavia eventually passed into obscurity after the colder temperatures returned in the mid 13th century, pointing to prevailing climate conditions increasing or decreasing cultural contacts across expanses of water. Likewise, the warming that began in the 8th century resulted in increased agricultural production but it also increased demand for more land to expand production necessitated by the increasing population. In turn, rising population stymied by lack
of adequate farmland prompted young Viking men to seek new opportunities abroad. Best known were the forays that Vikings made into Europe to collect booty. Less well known were the Vikings that settled in new lands, including Faeroes and Shetland Islands as early as 794 A.D. Soon after, the demand for land led to farmers settling in the British Isles, the Ukraine, and beyond (Fagan, 2008).

The voyages of discovery that took the Vikings to Iceland, Greenland, and Canada reported about the indigenous people they met along the way. They left a legacy that extended across the Arctic regions of Canada and Alaska, all the way to Siberia but they did not include trade with the people who inhabited regions further to the south. Why the Inuit people were anxious and willing to trade while others further south were hostile and protective of their territories was a subject of debate. The friendliness and openness of Arctic people to trade suggested intriguing aspects of life in very difficult landscapes. In climates that required daily risk of life against the weather and treacherous ice while hunting in hide-covered kayaks apparently translated into networking cultures that could enhance survival. Trade provided a means to improve one’s opportunities for survival. Trade also required a considerable degree of tolerance, cooperation, and maintenance of social relationships that made trade possible. Those long-distance trade networks that developed between Inuits and Scandinavians stand in stark contrast to the insular, territorially minded natives who occupied the lower regions of North America (Fagan, 2008).

Far to the west of the Bering Strait, the great Asian landmass was also impacted by climate change. Unfortunately, there was limited solid evidence upon which to make comparisons with climate conditions and relevant impacts upon people. With respect to the climate on the Eurasian steppes at the time when Genghis Khan embarked on his murderous
campaigns, the record is still almost blank, except for broad generalizations and just one or two tree-ring sequences” (Fagan, 2008, p. 61). However, the preponderance of evidence suggests that many great migrations in Central Asia were prompted by environmental conditions.

In spite of the limited evidence, there was one aspect of climate change and its impact upon humans that could be pointed to with certainty; when conditions deteriorate due to severe drought, people migrate. Investigations by Russian climatologists suggested there were lengthy climate cycles that persisted for approximately 4 centuries. Within those centuries-long cycles were shorter cycles that lasted approximately 30 years. According to their climate cycle model, the Asian landmass experienced four centuries warmer dryer climate beginning in the middle of the 9th century. To the west, the Scandinavians, or Rus, as they were known, began venturing into southern Russia, including the Ukraine, about 840. The Rus initiated trading colonies and, presumably founded the seedling for a Russian state that would later emerge in the realm of the Duchy of Muscovy in the 15th century. Warm climates and expanding populations contributed to some migrations and resettlement that was a significant result of the Viking forays (Fagan, 2008).

Farther west, The Northmen, or “Norsemen” aka, “Normans” (Riasanovsky, 1969, p. 27) attacked Constantinople in 862 A.D., in an event that was described by Eastern Orthodox Patriarch, Photius of Constantinople. It was a flexing of power among the powerful Germanic tribes that eventually encompassed an area stretching from the prairies around Kiev to the northerly areas of the Russian plain around Novgorod. The Rus cities became associates of the Hanseatic League, an confederation of charter cities organized for self-defense and promotion of trade during period that parallels the Medieval Warming (750-1250 CE) (Rianovskiy, 1969). The question is, how far reaching were the effects of the warmer climate conditions?
The Scandinavians who established the Kievan Rus were known as Varangians, according to Riasanovsky (1969), noting that Byzantine writings frequently mentioned the –Rus, Ros, Rhos, and Rusios as Normans, or merely a northern people” (pp. 27-28) as the northern neighbors of the Byzantines, distinguished from the East Slavs, who would dominant the region until the Russian State emerged at Moscow. Prior to that, the Kievan rule by one charismatic leader, Sviatoslav (r. 962 – 972), who was described in the *Primary Chronicle* of Constantinople as one who:

> carried with him neither wagons nor kettle, and boiled no meat, but cut off small strips of horseflesh, game, or beef, and ate it after roasting it on the coals. Nor did he have a tent, but he spread out a piece of saddle cloth under him, and set his saddle under his head. (Riasanovsky, 1969, p. 34)

In short, Riasanovsky stated that “Sviatoslav's appearance, dress, and manner of life all remind us of the steppe” (p. 34). Meaning that the environment and certain behaviors were closely interrelated – a point that is emphasized for purpose of this review. Environment posed the challenge and adaptation provided the means for the seminomadic cultural traits of the Slavic culture of the Steppe.

By the end of 13th century, the Medieval Warming ended in a transition period of highly variable conditions. The Scandinavian incursions in Europe and Russia ceased and a cooler period began with some years that were very wet and cool, followed by years of drought. During the interclimatic cooling, the *Chronicles of Novgorod* reported that heavy rains in 1143 and again in 1145 devastated the harvests and caused extreme hardship and even starvation among the people. In 1215 and again in 1230, many people in the region of the Kievan state were reduced to selling their children into slavery to limit the mouths that had to be fed. Worse yet, in Novgorod, it was reported that “the city’s inhabitants [had] to eat [tree] bark” (Fagan 2008, p. 57) and some
even”killed the living and ate them, others cut up dead flesh and corpses and ate them, others ate dogs and cats … Some fed on moss, snails, pine bark, lime and elm leaves, and whatever each could think of” (Riasanovsky, 1969, p. 57).

It is notable that the warming trend ended rather abruptly in the mid-13th century, when a much cooler climate settled over Europe, Asia, and North America. This cooler climate period, extending from about 1250 A.D. throughout most of the 19th century, was commonly referred to as the Little Ice Age, a period that witnessed the advance of glaciers in Switzerland, Alaska, the Andes, and even on Mount Kilimanjaro in Africa. Toward the turn of the 20th century, a warming trend began that continued into the 21st century. Russian climatologists studying climate changes on the Eurasian steppes pointed to overall trends that lasted for centuries, but within which there were smaller trends that lasted approximately 30 years. These alternating warmer or cooler patterns also signified higher or lower amounts of rainfall that characterized the various regions. While the overall amount of change in rainfall could be miniscule, small changes in precipitation spelled abundance or disaster for nomadic peoples living on marginal landscapes such as the Eurasian steppes. A small decrease in rainfall led to drought, a critical condition making it impossible for nomadic people to remain in one place for long (Keys, 1999).

Correlations could be made regarding the onset of droughts and changes in cultural primacy on the Eurasian steppes. Among the earliest known groups to migrate due to drought conditions were the Huns, a confederation of steppe warrior clans that occupied areas of the Central Asian highlands (Mongolia) sometime in the first century A.D. The Huns were the earliest known equestrian migration of a culturally identifiable people who moved out of their homeland due to climate conditions. Their successors, the Avars and Mongols, who followed in later centuries, took a similar pathway, responding to similar climate conditions. Each of these
migrations began as nomadic warrior societies and rose to great power due to their hit and run strategies, excellent horsemanship, skill with the bow and arrow, and ruthlessness. These nomadic confederations entered history as they swept into Europe to challenge the established social order (Keys, 1999).

Keys’ (1999) study of nomadic peoples who occupied the Central Asian highlands was the focus of his book, *Catastrophe*, in which he cited climate conditions, principally “drought and famine on the steppes [of Mongolia]” (p. 27) as the major force behind the migrations of Huns, Avars, and Mongols. Those cataclysmic migrations changed the face of Europe as large-scale disruptions and displacements occurred in successive chain reactions of destruction and movement. That movement, especially during the era of the so-called *völkerwanderung*, a German term for the series of migrations, included the Ostrogoths, Visigoths, Burgunians, Alans, Langobards (Lombards), Angles, Saxons, Jutes, Suebi, Alamanni, and Vandals during the first phase lasting from 300 to 500 A.D. The second wave of migration took place between 500 and 800 A.D., during which the Slavs settled in Eastern Europe, while the Bulgars moved into the eastern Balkan Peninsula, and Hungarians and the Lombards settled in the northeastern region portion of the Italian Peninsula (Keys, 1999). The resettlement of these various cultural groups could trace their original impetus to climate change in the form of droughts in central Asia.

While the evidence for climate conditions in central Asia the evidence from tree-ring analysis, ice cores, and historical sources gave reason to suggest causation for the earliest known human migrations out of Mongolia and other parts of Central Asia. Early on, the migrating Avars confronted the Roman Empire on the Balkan Peninsula in 557-558 A.D. At that time, the Avars had been the dominant people in Mongolia for nearly 2 centuries. However, their hegemony inexplicably ended in 545 A.D., possible due to incursions by another Mongolian people,
ancestors of the modern Turks, evidence suggests that a Turkic people gained power and overthrew the Avars, followed by adverse climate conditions that hit some areas harder than others. Reportedly, foul conditions struck in Mongolia between 535 A.D. and 538 A.D. when a period of severe drought struck the territories inhabited by the Avars. The physical evidence revealed that the drought that struck Central Asia was reported to be the “worst climatic conditions to have occurred in the previous 1,900 year period” (Keys, 1999, p. 28). The Avars occupied the grass-covered steppe that was, and still is much more sensitive to drought than the forested uplands” (p. 28) that were occupied by the Turkic people. “Grass, with its short roots, cannot flourish in temporarily waterless conditions, whereas trees and even forests undergrowth, with much deeper roots, can tap into damper ground hidden well below the surface” (Keys, 1999, p. 28).

By living in mountainous terrains, the Turkic people benefited from increased amounts of precipitation attributable to the orographic effect occurring when humid air is forced over mountain tops. The steppe-habitats of the Avars were more impacted by adverse climate conditions contributing to their ultimate defeat by the Turks. Those who were not slaughtered migrated toward Europe to provide the one of the earliest recorded major migrations of people in response to the periodic Asian droughts, migrations, and European invasion sequences that would continued throughout the following centuries (Keys, 1999). Those migrations also gave Europe the diversity of cultures that is today a prevalent feature of the United States.

Similar patterns can be attributed to the Huns in the 2nd century and millennia later when the Mongols arrived on the edge of Europe in 1227 A.D. The 13th century marked the end of the Medieval Warm period marked by enormous variability. The warmer climate that prevailed in Europe for centuries resulted in enormous population growth, and contributed to feudalism,
serfdom, scarcity of farmland, and the growth of great cities requiring a huge labor supply. However, this was suddenly challenged by the upheaval that accompanied the 14th century. Pope Boniface VIII declared the year 1300 A.D. to be the first Christian Jubilee year, a celebration marking the remission of sins in accordance with a universal pardon according to the Bible. The Book of Leviticus noted that a Jubilee year occurred every 50 years at which time slaves and prisoners were to be freed, debts were to be forgiven, and God’s mercy would be made manifest (Leviticus, 25: 8-18). In that year, the priest Jean de Venette described a prophecy that came to him in a dream. "In the year of the Lord 1315, shall begin a great famine on earth … Also, the Church shall totter and the line of Saint Peter shall be execrated … And the blood of many shall be poured out on the ground” (Sherman, 2006, p. 301).

It seemed the prophecy of was coming true prematurely when Pope Clement V became a virtual subject of the French king when the papal court was moved from Rome to Avignon in 1304. It seemed to many Christians that the Pope had become a vassal of Philip IV and viewed this "shocking breach of tradition” (Sherman, 2006, p.307) as the reason for the calamities that fell across Europe during the 14th century, the century of disaster. Before the century ended, there would be multiple popes ruling simultaneously from Avignon and Rome, leading Catholics to question the validity of their religious beliefs as never before. Further, during the height of the suffering that ensued during the plague years of the mid-century, the Church largely failed to provide the spiritual leadership that was needed (Sherman, 2006).

The Little Ice Age

Beginning in the early spring of 1310, Europe was enveloped in monsoon-like conditions with rain that fell nearly non-stop for days that became weeks then months.
Chroniclers all over Europe wrote that the rains—with unusually deafening thunder and terrible lightning—were steady from April throughout the summer. The winds and overcast skies made the whole growing season abnormally cool. The rains came when the seed had just been scattered—washing much of it away—and continued to fall throughout the summer, flooding the lower croplands. When farmers tried to harvest the meager crops, the rains came again. Rivers flooded, bridges were swept away, and the crops, with previously low yields, failed. (Sherman & Salisbury, 2006, p. 302)

Conditions did not improve; after years of dwindling production and widespread malnutrition, agriculture reached its nadir in 1315, exactly as Jean de Venette had prophesied. The famine persisted until 1322 when the years of cold, wet weather finally abated. Serfs and farmers abandoned the land in desperation searching for of food of any sort, including cannibalism. The famine escalated into widespread violence as storehouses, granaries, and even homes were raided in search of food. By far, the worst came with the onset of the Black Death or bubonic plague that wrought cataclysmic devastation (Sherman, & Salisbury, 2006).

During the plague years that reached their apogee between 1347 and 1353, many women, especially elderly widows and Jews, were accused of perpetrating the plague. The sight of corpses littering the streets of virtually every city and town throughout the civilized world induced hysteria of epic proportions. Executions for witchcraft reached numbers never before known, especially when it became known that Jews were dying from the plague in far fewer numbers than the population as a whole. The reason for this anomaly was due to Jewish religious requirements that granaries be emptied and swept clean each year before the new harvest could be stored. Unlike the granaries of Gentiles, the Jewish storerooms did not attract rats to the grain left in the storehouses; the waste attracted rats, the carrier of the fleas that carried the bubonic plague virus (Sherman, & Salisbury, 2006).

In the heat of fear that the plague induced, the masses were easily whipped into a frenzy
bent on retaliation against anyone and anything purported to be responsible. In one instance, witnesses described the execution of around 2,000 Jews in Strasbourg who were accused of causing the Plague. It was reported that they were "burnt on a wooden platform in the middle of their cemetery and many small children taken from the fire and baptized against the will of their fathers and mothers" (Sherman, & Salisbury, 2006, p. 305). In Germany so many women were deemed culpable and executed for witchcraft that some areas were nearly depopulated of women. Less gullible witnesses noted that the executions of the Jews were really about the money and property that was confiscated by the authorities in the immediate aftermath of the conflagration. In the final analysis, how many died as a result of the plague has never been certain; however, the estimates suggested that as much as half the total population of Europe perished. Following the 6 worst years of the plague, it continued to re-emerge at various times and places, but never again did it cause such a "tempest of death and destruction" (p. 305) as it had during the mid-14th century. Before it was over, more than 60 major Jewish communities in Germany alone were exterminated (Sherman, & Salisbury, 2006).

The European plague likely had its roots in the increased contact with the East following the Mongolian invasions or migrations. Their appearance on the edge of Europe in the 13th century was certainly a response to the climate change that took place between the 13th and 14th centuries. The Eurasian steppes during those years were characterized by "persistent high-pressure systems over the Arctic. These systems, which can remain stationary for long periods, prevent the passage of the usual rain-bearing frontal systems and draw in intensely cold, dry air from the [north]" (Fagan, 2008, p. 59).

In the great expanses of central Asia, the rainfall decreased by as much as 30 percent and: Precious winter feed had to be stretched for an extra two months or more, being doled out in ever smaller quantities. Oxen and cattle subsisted off bedding grass and lost weight.
Some became so weak that herders had to help them rise. Calving losses rose sharply. Emaciated beasts perished of cold or were lost in the deep snow. In particularly cold winters, both animals and humans died in large numbers. (Fagan, 2008, p. 59)

The most critical issue for the tribal cultures that occupied the Asian regions affected by the droughts was severe contraction of water sources. During the dry events, the nomadic people of those regions defined their territories around river valleys where the natural landscape provided protection from the extended harsh conditions of protracted winters while providing sources of water. The nomadic lifestyle typically necessitated that people leave the valleys as soon as conditions improved to forage for animals in the early spring. Among nomadic people, everything depended on supporting their horses and cattle. Animals provided the critical linkage between marginal landscapes consisting of mainly scrub grasses sedges, and the meat, milk, cheese, and yogurt needed for human survival. In good times, the migration out of the river valleys could occur as early as March, but during time of drought, they were often forced to remain in the protected valleys until May. This fine and dangerous balance that hung on the vagaries of the seasons and periodic droughts that sometimes lasted for years (Fagan, 2008).

The realities of medieval climate on the steppes...depended on the mobility and unique anatomy of the horse. The rhythms of nomadic life danced to the oscillations of the desert pump that brought drought, heat waves, bitter cold, and floods. These rhythms developed deep in history, long before the four centuries of the medieval warming descended on the steppes. (Fagan, 2008, p. 50-51)

It was during one of those protracted periods of drought that the infamous "Ginghis [sic] Khan” managed to pull together a confederation of nomadic tribes who responded to the droughts of central Asia by migrating to areas of better pasturage on the outlying edges of Europe, China, and the Ottoman Empire. Between the culturally adaptive migrations that characterized people of the steppe and the clashes of cultures that inevitably occurred as result of
climate change history was made such as the Scythians, Cimmerians, Huns, and Mongols. Those cultures based almost exclusively on the horse were by far the most adaptive because:

Horse riding was a revolutionary, if logical shift in human transportation. It cut travel time across the steppe, allowing people to exploit widely scattered food resources, increasing territorial boundaries by a factor of five and making a mockery of earlier constraints…Anyone who could cover these distances relatively rapidly could survive on the steppe, and the entire shape of society changed as a result. The steppe nomads could never settle in one place, for to do so would invite disaster from overgrazing. (Fagan, 2008, p. 55)

Feudalism that characterized the Medieval economy persisted for centuries as a result of the isolation of most communities that was partly due to a lack of trade networks. The large estates, princedoms, and earldoms that dotted the landscapes forced the self-sufficiency that characterized the feudal economic system. However, during the late Middle Age, trade networks began to reestablish in some regions of Europe as a result of demands for commodities not locally available. Attributed to the security provided by organizations of cities, like the Hanseatic League and renewed knowledge of the far East following Marco Polo’s journey to Cathay in the 13th century, trade opportunities grew in demand. Those changes spurred the growth of cities and doomed the insularity that underscored feudalism. Other cultural changes played a role in the shift in economic systems away from local toward international included the Hundred Years War and the replacement of knights by huge peasant armies. The significance of new technologies cannot be stressed enough as the rise of nationalism was led by the use of gunpowder in warfare. Meanwhile, changes in agriculture such as the consumption of legumes led to improved soils, and heavy-wheeled plows and draft horses replaced yokes and oxen” (Sherman & Salisbury, 2006, p. 263).

A century of change culminated in a remarkable period of growth and prosperity. The
Hanseatic League and the Renaissance helped re-establish trade. The climate turned cooler and wetter together with a far smaller European population following the Black Death of the 14th century that eliminated the surplus population that supported the feudal system. New opportunities opened up for both men and women that marked the end of economies based upon isolation and dogmatic tradition. In their place open communication emerged with the Gutenberg printing press that produced a modern popular culture – all tied to environmental changes that have been remarked on by virtually every comprehensive world history (Sherman, & Salisbury, 2006).

Major Characteristics of the Medieval Warm Period (800 A.D. – 1250 A.D.)

- Four centuries of warmer, drier climate
- Agricultural output increased
- Agriculture expanded northward and into higher elevations
- Shortages of agricultural lands led to clearing forests and expansion into marginal areas
- Oxen, yokes, and lightweight plows dominated
- Population growth increased dramatically
- Feudal serfdom tied labor to land
- Self-sufficient manor houses dotted the landscape
- Convention and tradition dominated the social order
- Vineyards established in England
- Settlements and dairy cattle in Greenland
- Trade networks expanded around the world
- Hanseatic League (900 A.D. – 1400 A.D.) security and trade among the charter cities

(Various sources including: Keys, 2008; Diamond, 1999, and Fagan, 2008)

The Little Ice Age (1250 A.D. – 1890 A.D.)

- Six centuries of cooler, wetter climate
- 14th century cusp marked by variability, malnutrition, famine, and pestilence
- Agricultural output was devastated at the outset but stabilized in time
- Violent uprisings set precedence for rebellions in the future
- Retraction of agricultural lands and shorter growing season
- Legumes and New World crops widely adopted
- Reduced population expanded opportunities for many (trades, crafts, industry)
- Draft horses, harnesses, and heavy wheeled-plows adopted increase production
- Glaciers advanced in the Alps and elsewhere
Mongol and Ottoman Empires established security and stability throughout Asia. Marco Polo traveled safely to and from Mongol-ruled China. The Italian Renaissance and city-states expanded trade with Ottoman Empire. Religious persecution, cold European climate (after 1250) induced migrations to America. The Industrial Revolution, textiles, and trade cause mass exodus of peasantry to the cities. The steam engine results in a transportation revolution. Rise of coal mines and iron production. 


The environmental conditions that induced the Mongols to travel to the edge of Europe was another factor of cultural exchange that contributed to the end Medieval culture, chivalry, knighthood, and feudalism. Genghis Khan’s advance on the west in 1220 and 1221 came at a time when dry conditions severely shrank the pasturage on the Central Asian steppes. While this was part of an on-going cycle, he was able to create a confederacy of people whose cultures were tribal, insular, and competitive. By the time he died in 1227, the Seljuk Turks and the Chinese were conquered and his legacy continued under his sons and grandsons. His son, Ögöti conquered the Crimea, Bulgaria, most of Russia, subdued Poland and Hungary, and reached the city gates of Vienna, Austria. Suddenly, in 1241, Ögöti died. His brother, Batu Khan saw his chance to become the Great Khan, and withdrew his armies from the region (Fagan, 2008).

Many speculated on what would have happened if Batu Khan continued the drive to “the ultimate sea” (Fagan, 2008, p.63). Conquering Europe would have been the inevitable consequence because the Feudal world of Europe did not have armies that could resist the Mongols and the heavily armored knights proved to be no match for the Mongolian light cavalry with their powerful bow and arrow skills. However, in hindsight, the influence of the Mongols was clear. The last devastating event to highlight the 14th century was the Hundred Years War (1337-1453) in which both the French and the English fielded huge armies of foot soldiers. As the Mongols had already proved, the English use of the longbow overwhelmed the heavily
armored French knights. At the Battle of Crécy in 1346, “the flower of French knighthood lay crushed, which struck a blow against feudalism itself” (Sherman & Salisbury, 2006, p. 312).

It is well known that gold was an important commodity in human trade networks. By the end of the 14th century, two thirds of Europe’s gold trade came from Mali. It arrived by transport across the desert on the backs of camels in what became known as the “golden trade of the Moors” (Fagan, 2008, p. 66). The Sahel was an arid to semi-arid region lying in a broad band parallel to the Sahara Desert and consisting of a variable landscape of sand, brush, and sparse grasses. The area was less productive than the Central Asian steppes but not a barren desert because when there was some moisture it resulted in almost instantaneous greening that just as suddenly disappeared—“The climate of the Sahel leaps abruptly and without warning from one mode to another in a completely unpredictable manner” (Fagan, 2008, p. 69).

Many people think of the Sahara and the Sahel as one large desert with no life. Nothing could be further from the truth. In warmer periods of the distant past, when the Earth was a tropical planet, North Africa was covered with vast shallow lakes and numerous seasonal rivers. Today, the only major lake remaining is Lake Chad that bordered Niger, Nigeria, Chad, and Cameroon. It was a region where the variable climate conditions created enormous difficulties for the inhabitants who lived by nomadic herding, hunting and gathering, and trade (Fagan, 2008). Though very different, it was not difficult to see correlations between the steppes and the Sahel because the horse was to the steppes what the camel was to the Sahel.

When the Romans developed North Africa as their major grain-producing region, they never ventured south into the Sahara Desert simply because they lacked pack animals capable of trekking through the desert for 10 days at a time. The camel was easily capable of such treks due to the storage of energy-giving fat in its humpback, their long necks that permitted them to graze
high up in trees and bushes, and their large padded feet that allowed easy walking across soft
sand and their ability to conserve water by allowing their body temperature to rise significantly
without perspiring. A problem for the Romans was the lack of an adequate camel saddle until the
early Christian era. Roman occupation of Egypt was difficult because of their culture was largely
based on trade that used roads. Egypt’s difficult terrain made it all the more necessary to move
commodities and the effective load-carrying camel saddle was greatly limited until a truly
workable saddle was developed in the region of modern Sudan in the early 4th century. In terms
of environmental significance, it was only with the advent of the so-called Saharan saddle that
the camel became the culturally-significant ship of the desert (Fagan, 2008).

The camel saddle was a unique piece of equipment fitted on the animals’ shoulders
forward of the hump. It capitalized on the camel’s strongest carrying point, thus, permitting long-
distance travel without too much burden. Many incredible stories attested to the strength and
endurance of camels, for example, a camel carried a full-size grand piano to its new owner who
lived far in the Australian Outback. It was unknown when the first camel caravans began
negotiating the Sahara, but camel routes across the desert were well known long before the
Islamic invasions of Northern Africa in the 7th century A.D. (Fagan, 2008).

The flexibility of the camel was essential to the gold trade that eventually provided nearly
all of Europe’s gold. Until the 12th century, most of the African gold remained in Muslim hands.
Europeans had very little gold because for many years, the balance of trade had favored the
Muslims and its low supplies were not being replenished. In the 12th century, several Italian city-
states grew rich and powerful due to textile trade with the East and built powerful navies to
protect their interests. The turnabout in trade balance began drawing gold allowing Italian cities
and other Europeans to return to the gold standard (Fagan, 2008).
The gold trade was a defining aspect of world culture. In Florence, coinage of gold florins became an international standard that played a role in the development of the modern banking system. It was unknown how much gold flowed into Europe, but tax records from one entrepôt recorded 8.4 metric tons in the year 951 A.D. In order for the Europeans to readopt the gold standard, enormous amounts of gold had to flow north but no one was certain of its origin. In the 10th century, the Muslim geographer, al-Bakri, recorded that gold, salt and other goods were carried on camel caravans arranged by Sanhaja nomads of the desert. He noted that the nomads were careful to maintain good relations with the officials of the kingdom of Ghana where they traded for gold. It was the stuff of legends, as the gold trade was incredibly surreptitious. Al-Bakri noted that caravans obtained the gold from the capital city known as Koumbi Saleh, located about 300 miles south of Timbuktu in the great bend of the Niger River. Today, at that particular location, there are some extensive stone ruins containing Arabic inscriptions, but no trace was found of anything suggesting a palace nor any burials or memorials suggesting a royal presence. In his study, The Great Warming, Fagan (2008) noted that,

…for the moment, the kingdom of Ghana remains elusive, its capital peripatetic. Our only certainty is that it was not an Islamic polity, but an indigenous African domain, something very different from al-Bakri’s portrait, with roots deeper in West Africa, where the gold came from. (Fagan, 2008, p. 77)

Instead, the trade occurred more in line with the style that Herodotus once ascribed to the Phoenicians as both pragmatic and secure because according to Muslim historian, al-Yaqubi, writing in 872 A.D.:

The miners were well aware of gold’s value and kept the locations of their ore deposits a close secret, lest outsiders try to take control of the supply. For this reason, they refused to trade face to face: the merchants piled their goods, mostly cake salt on the riverbank and passed out of sight while the local people place heaps of gold alongside each pile. If the visitors were satisfied, they would take the gold and retreat, beating drums to signify
the end of the transaction. (qtd. in Fagan, 2008, p.78)

The origins of the tons of gold that traversed by camel to Europe for centuries remained a conundrum, but the reality of the impact on Europe, the Middle East, and beyond was immeasurable. Further, there were similarities to the diamonds that filtered into the black market out of secret locations in Africa. The so-called “blood diamonds” were identified as funding numerous revolutions throughout Africa. There are even unsubstantiated allegations connecting illicit diamonds to al Quaida. In any event, the process worked through forced slave labor providing the diamonds to revolutionary armies who literally stood guard over the workers (National Geographic, March 2008).

The Volcano Gods

Mount Merapi, Indonesia was one of the most active volcanoes in the world. It killed many times in the past, and pyroclastic flows could occur at any time without warning. On occasion, those who inhabited its flanks knew to run when the monkeys did to lower elevations and safety when the mountain shook. Some never ran regardless of how much the mountain trembles and roars. One such was Marijan, The Gatekeeper of Merapi, a man tasked with a very important job, to hold the fate of more than a half-million residents of the city of Yogyakarta, lying just 20 miles from Merapi, in his hands. It was his job to perform the rituals designed to appease an ogre believed to inhabit Merapi’s summit” (Marshall, 2008, p. 38).

The job of shaman to volcano gods might seem silly and suicidal to Westerners but in Indonesia it was serious business. In fact, the culture of the 17,500 islands was so intricately intertwined with the 129 active volcanoes that it would be impossible to tell their story describing their relationships and their culture without mentioning their mountain gods. That
relationship was one fraught with danger. The danger was real and eruptions were commonplace with Indonesia being the site of one of the greatest volcanic explosions in historic times. Just off the coast of Java, Krakatau (aka Krakatoa) erupted in 1883 killing more than 36,000 people. While Indonesia was home to many religions, including Islam, Hinduism, Christianity, and others, all faiths adhered to a reverence and spirituality associated with the volcanoes.

You might say that in Indonesia, volcanoes are a cultural cauldron in which mysticism, modern life, Islam, and other religions mix—or don’t. Indonesia, an assemblage of races, religions, and tongues, is riveted together by volcanoes. Reverence for them is virtually a national trait. (Marshall, 2008, p. 41).

Inasmuch as the Indonesian volcanoes posed great danger, they also provided some the most fertile agricultural soils in the world where three crops a season were common. The beneficence of the mountains required constant attention and every locality had its own peculiar traditions and beliefs. There were six official religions in Indonesia, all of which were riddled with mysticism. Essentially, they are syncretic religions that have adopted a certain degree of animism into their belief system. The Christianized Batak people of Sumatra were one example because they continued to practice their belief in Mount Pusuk Buhit as the genesis of all humankind. On the Island of Flores, all dead, regardless of religion, were buried in cemeteries with their heads toward Mount Ebulobo. Hindus and others on East Java periodically sacrificed money, vegetables, and even an occasional goat into the caldera of Mount Bromo (Marshall, 2008).

It was impossible to visit Indonesia and not be impacted by the culture, traditions, and beliefs in the volcanoes. They infiltrated every aspect of life and no one was unaffected, not even the President. Just a few months following the inauguration of the current President, Susilo Bambang Yudhoyono in October of 2004, an earthquake and tsunami killed 170,000 people. That
was followed 3 months later by another earthquake that killed more than a thousand. Then, Mount Talang erupted with great violence that forced evacuations of thousands of inhabitants. Suddenly, an enormous public message was conveyed to the President asking that he "please sacrifice 1,000 goats" (Marshall, 2008, p. 48) to help put an end to their misery. The President refused, saying that a sacrifice would not stop the natural events from occurring. However, in the 6 months following there was one calamity after another that included several major earthquakes, a major tsunami, several significant floods that also caused some catastrophic landslides, and then several major forest fires broke out. Those horrendous events were accompanied by virulent diseases including outbreaks of dengue fever and influenza. In an age-old dance with death, old superstitions gained precedence over rational religion and finally, in the wake of a particularly enormous eruption of steaming-hot mud "that has continued to erupt mud to this day" (p. 49), and amid the public outcry for an end to the run of bad luck (or was it to dispel the anger of old gods?), finally the President and his entire cabinet acquiesced and held special prayer gathering attended by thousands at the Grand Mosque in Jakarta (Marshall, 2008).

So many politicians paid obeisance to volcanoes before and after running for office that a helipad was built at the top of a large volcano near Lake Toba. Such a convenience lends credence to the power of old beliefs as politicians hedge all bets and make small sacrifices to "the spirits of the mountains" (p. 49). These public and private demonstrations by the leaders and ordinary people demonstrate the power of ancient beliefs that "in the smoking caldera of Indonesian politics, belief in the supernatural persists among even the most modern, high-ranking leaders … [who] claim to be rational … but in their hearts, they still believe in mysticism" (Marshall, 2008, p. 49). While demonstrations of obeisance may seem antithetical to the rational Western mind, it should be noted that even Indonesian volcanologists, educated in
the best American universities, take great care not to offend the volcano spirits – they are beliefs that simply run too deep. It is but an example of the enormity the environment in the socialization of people on a case-by-case basis.

Testosterone Behavior

Following the announcement that the governor of New York State, Eliot Spitzer, spent many thousands of taxpayer dollars on call-girls, the NBC Today Show (March 10, 2008) convened several experts on human behavior to comment on Spitzer’s actions. It was striking that one of the panelists commented that certain physical features of Governor Spitzer indicated that his body contained more testosterone than average, and that Spritzer’s “prominent, high cheekbones were a physical trait that was consistent with men who had an overabundance of testosterone” (Today Show, 2008). Furthermore, “men prone to dangerous sexual behavior typically had more testosterone than the average male” (Today Show, 2008).

If it were the mid-20th century, such observations regarding the physical features of a man would be dismissed as pseudo-science. After all, one of the most famous such spurious sciences was phrenology (described in Chapter 2) in which it was believed that the shape of the human skull could provide information regarding the underlying motivations of each individual. Perhaps, it was unfortunate that there was no real scientific basis for phrenology; if there had been, all criminals would have been simply identified by the shapes of their skulls and proactively sent to prison. On the other hand, today there was new attention given to the idea of sociobiology in which social genes are believed to control certain behaviors.

Couched within the concept of sociobiology were the assumption that adaptive strategies that result from some kinds of behaviors were inherited and likely a response to natural selection.
These behaviors were modified over time by changing environmental conditions. The theory was founded on the understanding that certain physical traits evolved and predicted that animals would behave in ways conducive to evolutionary success. Sociobiology was a discipline that sought to explain behavior as a product of natural selection and that behavior was another way in which organisms could preserve and pass on one's genetic material.

Another relevant example of how nature and culture can intertwine was provided by the way in which Latin displaced the Celtic languages throughout Europe following the Roman domination of those areas. However, it was not because of superior numbers that the Roman language became the common language in those regions, because the Romans never dominated by sheer numbers, but rather because Latin became “the medium of commerce, law, civilization, and personal prestige” (Young, 2008, p. 139). The Romans occupied both France (Gaul) and Spain (Iberia) and Latin became the standard language in both regions as the result of Roman occupation. If the Latin-speaking Romans displaced the native languages, how was it that the languages became so different from one another? The obvious answer was the natural barrier to diffusion that divided those two countries, the Pyrenees Mountains. Today, English has become the international lingua franca that has led some cultures to claim the Americans are practicing cultural imperialism (Young, 2008).

A Culture of Salmon

The Chinook salmon industry that has provided jobs for thousands of people in northern California, Oregon, and Washington offered a powerful example of economics and nature. The salmon-based economy created a maritime culture, shaped by fishing and processing activities. Developed over more than a century, the industry prospered due to the increasing popularity of
salmon throughout the United States. However, in 2008, the population of Chinook salmon inexplicably nosedived precipitating an economic crash among those whose lives depended on fishing. A number of emergency hearings were called by federal fisheries management but no solutions were forthcoming. The only options included whether or not to close the salmon-fishing season in an effort to save the few remaining Chinook and await the next season in hopes of improvement (Young 2008).

The fact that the salmon population suddenly crashed has had a dramatic impact on the lives of the fishermen and the local economies of many community stretching from Washington State all the way south to the Mexican border. The loss of the wild salmon has left a culture without its source of livelihood and how their lives may change remains to be seen as “The likeliest outcome this year is no one will put a hook in the water” (Young, 2008, pp. 139-40). Ninety percent of Chinook spawned in the Sacramento River and were considered among the healthiest salmon populations along the West Coast. This crash followed a similar loss of Chinook that occurred on the Klamath River in 2006. The loss of the Sacramento fishery would doubtless be adjusted to increased reliance on farm-raised salmon. Today, the major populations of wild salmon that are still fished in abundance are found only in Alaskan waters. The loss of salmon will certainly push salmon prices up but the cost to the coastal communities that depended on fishing may become another extinct community of culture (Young, 2008).

Chinook spawning in the Sacramento River and its tributaries numbered nearly a million in 2002, but the returning young male fish, known as jacks, hit an all-time low in 2007 with only 2,000 recorded. Experts have been uncertain what caused California’s salmon collapse. Some believe it was due to climate change or some unexplained disruption in the Pacific Coast food chain, while others blame pollution or diversions of water for major infrastructure projects in the
Sacramento-San Joaquin Delta. Whether or not this environmental change was a natural event or the result of human-induced conditions was not clear. Either way, it provided insight about the way in which the environment sets limits within which human activities develop and, as such, established the underlying structure upon which the development of an economic system emerged that in turn produced relevant cultural traits (Young, 2008).

Fur and Codfish

An analogy to the Chinook salmon may be found in the crash of the codfish industry in the 1970s. Cod fishing had thrived for centuries along the northeastern seaboard of North America but today the fishing culture is barely visible in onetime fishing towns like Digby, Nova Scotia. The economic changes in the wake of the fishing economy have been partly replaced by a paradigm shift to fish farming in the inlets around the Bay of Fundy. The fish farms rely on the strong currents of the largest tides in the world that naturally flush the refuse produced by the millions contained fish. The old culture of cod is only evident in the hundreds of boats that sit rotting high and dry on beaches of Nova Scotia – a testament to a way of life that disappeared (Young, 2008).

Like the fur trade, the codfish industry played a major role in the cultural economy of much of North America throughout the better part of four centuries before collapsing in the 1970s. Cod were particularly critical in the settlement and history of Canada, colonial America, and Europe. Unlike the fur trade, codfish remained an important staple in northern America and Canada until the culture that depended upon it overburdened the ecological system. Besides place names (toponyms, including Cape Cod,), cod was the major staple that opened up much of North America to European colonization. Among the early travelers into the regions that would
later be considered unknown and unexplored, the Phoenicians and other mariner peoples quite likely made many extraordinary oceanic voyages. Most recently was the intriguing discovery of the Kennewick Man in 1995 along the Columbia River, whose remains are believed to belong to a man of European origins. If he were indeed European, that would push back the contact between Europe and America by many centuries (Lanctot, 1963).

In terms of human culture, simple changes in fashion could be either a boon or bust for the natural environment. Human fashion did both things in terms of the North American beaver. Because of fashion, the beaver became in such commercial demand that only a change in fashion finally saved it from complete extinction because of the early American fur trade. Still, both beaver and codfish were natural resources that underscored the economic foundation of early America. If there had not been the means for men to make money, there would have been no development, and settlers would have been much less likely to migrate. The economic livelihood of huge regions of the country were drawn, colored, shaded, and otherwise designed as reflections of whatever economic commodity was being commercially exploited at any given time, whether it was beaver, codfish, whale oil, bird feathers, or black gold, among others. The story of economic exploitation remained as little stories on historic highway markers together with a few remnants including some toponyms, such as the Walddorf Astoria Hotel. Toponyms told a great deal about such early cultural developments in response to natural resources. The New York hotel for example was named after “Wald Dorf,” or the “village by the wood” (Lanctot, 1963, p. 38) from which John Jacob Astor and three generations of his family hailed along an ancient Roman road near the university town of Heidelberg, Germany (Lanctot).

It was the culture of fashion that drove the fur industry and produced one of the world’s first self-made multi-millionaires, John Jacob Astor, and helped establish a pattern of utilitarian
capitalism. Codfish created a steady food source permitting settlement and evolution of other industries in the far northern regions. Economics, an underlying aspect of all cultures, was only possible in such hostile environments as long as steady food supplies were available. The cod provided for nation-state-building industries, including the lumber industry that built cities and shipbuilding industries in New Brunswick and New England that in turn created employment for huge numbers of immigrants and developed an economic-cultural system of which vestiges of cultural substrate still remain today (Lanctot, 1963).

The winters of colonial Canada were counted as 153 days of meager survival before spring returned with the good life of ample food. It was also the time of very long winters that were characteristic of the Little Ice Age that lasted from 1250 CE to 1850 CE. The extreme conditions reduced survival in many areas to nearly complete dependence upon the codfish. It was of “first-rank importance…because it was so easily caught and preserved” (Lanctot, 1963, p.76). The news of this incredibly abundant food source was first carried to Europe by John Cabot in 1497; he reported that the fish were so numerous they could be “scooped up out of the sea in baskets” (p. 76). Within a couple of years Breton, Basque, and Portuguese fishermen were plying the waters off Newfoundland in great numbers. The French became quite literally addicted to green cod, which were pulled on board ships and thrown on tables where they were cleaned, salted, pressed, and layered in wooden barrels. The English preferred dried cod in which cod were placed on drying racks along the shorelines of rivers and islands and carefully turned every 6 hours until thoroughly dried before being packed into barrels. Interestingly, all countries deemed the livers especially valuable and fishermen made the greatest profits on the oil that was processed from cod livers due to its presumed ability to cure all ailments (Lanctot, 1963).

Less well-known stories about the whaling industry have similar themes to that of
codfish. Whaling in the region from New England north to the St. Lawrence River was once the center of a culture in the days when whale oil was the essential commodity of everyday life around the world. Whale oil provided the light for virtually every lamp throughout the civilized world of the 17th through 19th centuries. In early America, the culture of whaling produced many spinoff industries and employment in forestry, shipbuilding, carpentry, rigging, sail making, metal smiths, and the manufacture of a host of ship chandlery items. The related industries defined the lives of an enormous population in which fishing was central. Well into the 20th century, cod liver oil was a ubiquitous presence in the lives of virtually every household in Europe and America (Lanctot, 1963). The natural resources defined the parameters of the economy and the maritime culture that remains something of a pleasant anachronism for tourist of today. The recent declines in fishing, as in the past, will no doubt change behaviors as economic dependency turns to new resources and lives and histories of people and traditions that were built over time only to disappear at a moment in history (Lanctot, 1963).

It was daunting to estimate the influence of any given natural resource on a culture. When considering natural resources and their impact on cultures, the questions mount rapidly. For example, how did fishing influence the culture of Brittany? Or, what happened after the forests of England became insufficient to build the ships needed for the English navy and commerce when it became necessary to access resources in more out of the way places? Why did shipbuilding first obtain its resources from the Nordic regions of Europe and then find it more economical to shift to the New World, eventually moving shipbuilding to New Brunswick? How were those natural resources reflected in the cultural development of settlements that were dependent upon them for economic survival? If we described an agricultural society, what role did weather patterns and characteristic soils belonging to a particular area have on the type of
agriculture practiced? What did the type of agriculture have to do with cultural expressions?

The Eugenics Movement

Was it coincidental that many expressions of Judaism derived from the agricultural seasons found in ancient Judea? For example, the religious year began with Pesach on the 15th day of the Jewish month of Nissan, which correlated with March and April in the Gregorian calendar and involved rites related to spring preparation and planting. Pesach was the first of the three major festivals with both historical and agricultural significance. The other two were Shavuot, which commemorated the giving of the Torah (first five books of the Bible) to Moses (and thus to his people) and celebrated the harvest of the first fruits. The third was the Skit, which is a festival that commemorated the wandering of the Jews in the desert, and the final harvest of the year. Was it significant that agriculture played such a major role in the history, culture, and practices of Judaism? Did not every culture have similar correlations? Cultures everywhere find the inspiration and reflection of some order that existed in the natural world to intertwine nature and culture.

In 1935, Hermann Goering was quoted as saying “I decide who is a Jew around here” (Will, 2007, p. A4), when he was told that his favorite art dealer was a Jew. The question of who was a real American was becoming just as arbitrary. The United States was once thought to be a melting pot in which ethnicity simply disappeared into a thoroughly blended synthesis that blurred all traces of racial and ethnic distinctions. However, around the country there continued to be enclaves of ethnicity in which reflections of foreign places shone clearly. Curiously, this cultural and or racial plurality was partly due to well-intentioned legislation aimed at preserving multiculturalism. While that was deemed a good thing, the loss of ethnic or cultural differences
by the older American amalgamation ideal may have now become a thing of the past and a bad thing. The result of this type of social engineering has created problems where none really existed before, as an onslaught of relevant legislation and litigation may be expected to follow (Will, 2007).

In recent years some Hawaiians have initiated a political movement to change their official status with the federal government that successfully induced Congress to pass legislation to save racially and culturally pure Hawaiians from extinction. It has been estimated that there are only about 7,000 “pure” Native Hawaiians” (Will, 2007, p. A4) in existence today. These 7,000 have become the cherished criterion for a one-drop rule that would likely prevail as a way of determining or designating who could call themselves true Hawaiians. The racial sorting of society was deemed correct in a world in which the state made decisions regarding which ethnic heritage belonged to whom. The apologists have been rewriting the books to make it seem right and reasonable to believe in values that seemingly are nothing less than reflections of those that were held by people like Adolf Hitler and Hermann Goering (Will, 2007). The importance of studying the relationships of humans and environments in all its poses and guises should not be underestimated unless such values become perverted and history repeats itself with the full support of governments.

In an effort to keep from losing ethnic diversity and multiculturalism, the government would create a class (caste?) of Native Hawaiians to receive special treatment. The Native Hawaiian Act would exempt true Hawaiians from the 1st, 5th, and 14th Amendments and renegotiate between Hawaii and the United States regarding “lands, natural resources, assets, criminal and civil jurisdiction, and historical grievances” (Will, 2007, p. A4). It might also open the issue of reparations and even secession. The U. S. Congress initiated this special treatment
of Hawaiians in 1993 with only minimal expectations that it would do so, and went a step further by voting to apologize to Hawaiians for the 1893 overthrow of the established royal government of Queen Liliuokalani with the apparent complicity of the U. S. government. This was in spite of the fact that the government never took any Hawaiian lands by force as it did from the Native Americans (Will, 2007).

What precedence may be established by the special treatment of Hawaiians by the federal government may have important ramifications for other American ethnic groups. Perhaps the more important question this raises is why the government took steps to identify and establish special treatment of this one particular ethnic group in the first place? While it may appear that to have occurred for well intentioned reasons, including the protection and preservation of Hawaiian ethnic heritage, there is an undercurrent of understanding that the legislation is also aimed at preserving "pure" Hawaiians from genetic extinction. Where does the issue of cultural identity play in the matter? What relevant issues does such social engineering suggest for the future? Will this issue eventually be remanded to the courts?

The U. S. Constitution speaks not of native peoples’ but only of Indian tribes. [However] The Native Hawaiian Act would create a Hawaiian tribe as a nation within the nation …Congress does not create tribes, it recognizes them according to settled criteria: Tribes were nations when the Constitution was written and are geographically separate and culturally distinct communities whose governments have long continuous histories. [However], as the state of Hawaii has said, The tribal concept simply has no place in the context of Hawaiian history,…this legislation will inflame the ethnic grievance industry. [This legislation] is an important symptom of …[the] constitutional flippancy and itch for social engineering. (AARP, March, 2008, p. 13)

Another issue of natural determinants (genetics), culture, and politics was revealed in an article published in the AARP Bulletin (March, 2008) in which a 39-year-old Choctaw woman was featured as one among thousands of people who had lost their medical benefits. The
case highlights how victims of a new federal rule, aimed at keeping illegal immigrants off the Medicaid rolls by requiring that recipients prove their citizenship” (AARP, March, 2008, p. 13-16) with documentation that most do not have. In some ways this situation is reminiscent of Nazi Germany in which everyone must have identity papers or face harsh repercussions. The Native Americans involved in this ruling are all indigenous, native born inhabitants of the United States, although most live on federal reservations. The reason for their denial of benefits is because they and their ancestors never completed the official documentation necessary to prove citizenship. The Native Americans failure to complete the documentation has been largely due to their culture and customs that include extreme distrust of the federal government who remain the hated conquerors that few want any involvement with. Reservation life tends to be self sufficient and ignoring the government is part of the “way of life” (p. 14) that insulates them from the U. S. government. In general, Native Americans are incensed by such documentation because in their culture ones existence is plainly self-evident and should not require a paper to prove. The upshot has been a new victimization of Native American women and children who became a minority group that does not quite exist in the eyes of bureaucracy (AARP, March 2008).

It was partly due to the historic conflict between the U. S. government and Native Americans that the rules were adopted that eliminated Medicaid benefits to those without birth certificates. The concern of the federal government was presumably that Native American communities could be used by terrorist for staging covert activities. This governmental action appears both reasonable and unfair at the same time. However, the denial of benefits is likely a short-lived event as litigation commenced almost immediately. Still, it serves to illustrate how often well-intentioned actions turn out to be misguided and problematic in the fluid geopolitical environment. It also demonstrates how fear can cause knee jerk reactions that can have
unfortunate outcomes. In this case, Native Americans were included in xenophobia that seized Americans in the aftermath of the Twin-Towers disaster of September 11, 2001. Was this a natural outcome of cultural viewpoints?

President Bush approved many measures aimed at eliminating as many avenues for terrorists hiding places as possible. With the improbable possibility that terrorists might use federal benefits programs to help finance sleeper cells more than 20,000 women and children were dropped from services in the State of Oklahoma alone (AARP, March 2008). Was this purge of aid to one ethnic group tantamount to ethnic cleansing? Did the national security outweigh the humanitarian aid that was denied to those in need? Such questions are tangential to the central concern: how did environmental factors drive the response? In the larger scheme of things, cultural survival invariably requires that adaptive steps are taken to minimize threats?

According to Darwin’s theory of natural selection together with the natural environment provide a milieu in which the rule is adapt or die. While social engineering is generally reviled, it is also practiced by the social systems that reward intellect and good behavior while penalizing stupidity and bad conduct. The implications relevant to environmental determinism are connected to some of the most dangerous of historic precedents in which conquerors establish caste systems in which the conquered or minority immigrants are placed on the bottom rung of the social order. The examples are everywhere: the Aryan invaders of ancient India who created one of the most rigid caste systems made the conquered people the untouchables; the apartheid system of South Africa; and the Jim Crow segregation in the United States are but a few examples.

The elements that made the conquerors superior were nearly always of an environmental source such as combinations of advanced technologies that could not be matched by less-
developed cultures. Eventually, the environmental and cultural elements became blurred and beliefs in the status quo became an iron-clad system that could only be reversed by revolutionary forces. Throughout the millennia occupied by cultures and civilizations rising and falling, paradigms have been established by people to make sense of the misery and mystery that their awareness permitted. They simply filled in stories where understanding could not extend simply because the social impulse is to believe in the superiority of some and the inferiority of others and a hierarchy overall. In virtually all such examples of primitive societies there is a powerful environmental component that typically results from a special blessing of the gods. Those who become leaders invariably parlay the beliefs and myths to include themselves at the top, while those at the bottom are taught to accept their inferiority and adapt to their station with belief that they may achieve some benevolent return for their suffering in the present (AARP, March 2008). The belief systems that keep these rigid castes in place define their condition as coming down from above and God and Nature become blurred but nonetheless, irresistibly authoritative and fixed.

The examples thus far described serve to emphasize how cultural adaptations to natural conditions occur, and have occurred throughout history. Societies continually make judgments about other people based on where they came from whether from across the tracks or across the world. When national governments made rules calling for special treatment of people based upon whom and where they were from it is a matter of social engineering. Environmental determinism has attributes that can serve as a tool for investigation and explanations of certain man-land relationships. However, its limitations must also be recognized beginning with that of its founder Ratzel, whose implications may well have been at least partly misinterpreted, mistranslated, or skewed by its critics. If not misunderstood, perhaps a simpler explanation may be called for in
the application of the concept of environmental determinism. It may also be that Ratzel’s thesis may suggest only details or even overarching influences that have compelled humans to respond to their natural surroundings within the confines of range of possibilities and finite outcomes. Regardless of how the environmental influence, factors, or causation are defined, the environment consists of broad range of elements, both natural and cultural.

Consider the example of migration:

Theorists attribute international economic migrations to a series of often overlapping mechanism. Differentials in wages and job opportunities between home and destination countries are perhaps the major driving force in such individual migration decisions. Those differentials are in part rooted in the built-in demand for workers at the bottom of the labor hierarchy in more prosperous developed countries whose own workers disdain low-income, menial jobs. Migrants are available to fill those jobs, some argue, because advanced economies make industrial investment in developing or colonial economies to take advantage of lower labor costs there. New factories inevitably disturb existing peasant economies, employ primarily short-term female workers, and leave a residue of unemployed males available and prone to migrate in search of opportunity. If successful, international economic migrants, male or female, help diversify sources of family income through their remittances from abroad, a form of household security that in itself helps motivate some international economic migration. (Fellmann, Getis, & Getis, 2007, p. 83)

It was impossible to separate the causes of such migrations, but they combined various factors including conditions of overcrowding (e.g., slum conditions), poverty, war, famine, and related concerns about health and outbreaks of pestilence. Push factors were often accompanied by other conditions that were easily ignored because they were less obvious. Perceptions of target locations played an enormous role too. Perceptual elements that pulled people might include attributes such as job opportunities, climate conditions, freedom of movement, more living space, the lure of exotic differences such as the conquistadors expectations of exotic women, and endless other very personal reasons. In the final analysis it should be noted that the cultural and natural environment can be difficult or impossible to separate.
The contemporary example of Hispanic immigration to the United States revealed a wide array of conditions, both natural and cultural, that led people to seek domicile outside their homeland. For example, the Mexican border towns adjacent to the United States contained thousands of mostly American-owned industries known as *Maquiladoras*. A phenomena resulting from the North American Free Trade Agreement (NAFTA) created environments along the border that drew thousands of workers and hopeful workers to the border region where outsourcing industries, comprised mostly of assembly plants, located in 1990s. In the age of “hyper competition” (Fellmann et al., 2007, p. 309), outsourcing inevitably targeted the populations willing to work for the lowest wages. This might be children, or more acceptably, women. A major consequence of outsourcing that created the *Maquiladoras* was the phenomena of employing nearly a million Mexicans, consisting mostly of women because they were less expensive, more docile, and better able to carrying out tedious, intricate detailed work. Presumably, women’s hands and fingers were smaller contributing to the enhanced dexterity required in most assembly plants (Fellman et al.).

The upshot was that the Mexican border towns were characterized by large numbers of unemployed men. These unaffiliated men contributed to the crime rampant along the border ranging from murder and domestic violence to the transport of migrants and drugs. Similar patterns existed wherever migrations dominated particular regions. Was this a pattern of cultural behavior responding to arbitrary cultural limits such as a border? What if there were no borders? The European Union attempted to unravel the issue of borders so that eventually crossing from one country to the next would be like driving from Tennessee to Texas with no border checks. One of the notions of a continent-wide trade partnership was the Free Trade Area of the Americas (FTAA), which included a provision to dismantle borders. Nothing naturally existed
on the ground to make us believe there were borders. How did this transformation of the natural world into a cultural world of limitations and dead ends come about and why?

Should geography just describe physical conditions present in any given area, or should it go further and suggest solutions to questions and problems? Should geography be a hard science like geology with a primary focus on observation, classifications, and collection of specimens? One of the essential elements of the protagonists of environmental determinism steered geography toward a more positivistic role including cause and effect. Does the focus on description make a science any more or less valuable than a science that seeks to identify problems and uncover solutions?

In one example, along the coast of Southern Spain near Rota, the local fishermen built rock wall enclosures within the tidal basin so that when the tide went out, fish were captured in the numerous rock traps built for that purpose. The fishermen dipped nets to scoop up the trapped fish to provide a sustainable way of life for many people living in this seaside village. In turn, any number of common behaviors typified the local culture from making dip nets to the fare served in local restaurants. Interestingly, there were comparable cultures living on islands in Indonesia who used the same fishing method typified by comparable cultural traits. Did this constitute environmental determinism? The answer was both yes and no. While the environment set certain parameters, the argument against determinism stated that people still chose from among a set of possibilities.

It has been noted that more primitive societies seem to suggest a stronger argument for environmental determinism – but, what about a highly urbanized contemporary society? Adaptation was always a critical element for survival in a wild, natural environment; however, in more-developed, civilized societies the direct connection between human behaviors and the
natural environment has been blurred by the built-up environment belonging to the cultural landscape. Urbanized environments are dominated habitable landscapes that essentially do what shelters have always done – protect humans from the elements. That modern buildings offer more protection than simple shelters does not alter the fact that they accomplish the same purpose. Survival, too, has changed but remains a central aspect of human endeavor. As described in the 1981 movie The Gods Must Be Crazy, a group of hunter gatherer people, the Kalahari Bushmen, encountered an artifact of civilization the likes of which had never been seen before. Though the artifact was simply an empty Coca Cola bottle, they were profoundly changed by it. Soon they were jealous, angry, and fighting over this one object that everyone needed, and which there was only one of. In one scene in this semi documentary film, a pronouncement was made concerning the human condition in which it was noted that every day civilized people must adapt and readapt themselves to conditions that humans had themselves imposed on the natural world. One message of the movie that once humans become “civilized” they never want to go back to a primitive lifestyle that would bring mankind closer to the natural world.

While isolated examples are not in themselves proof of environmental determinism, the contention was that, while the semantics changed, the core belief that the environment was the single overarching structure setting the parameters for all human activities remained a core belief among the social science disciplines. This contention lurked in the shadow of the published reports in the professional journals of geography that environmental determinism was essentially ostracized out of mainstream teaching many years ago. Still, the social sciences, geography especially, continued to point to the environment as a major influence in human affairs but stopped short of declaring the environment to be a determinant. The terminology that led to
determinism was the result of a single student who translated a concept from German into an idea for an American audience. Those who have ever sought to interpret from one language into another have typically found that differences in shades of meaning could result in very different conceptualizations. The English word *landscape* and the German word *landshaft* were examples of how misunderstanding occurred when a word that sounded similar and had similar roots gained cultural shadings of meaning over time and were used synonymously.

Unfortunately, the word determinism was sometimes used where the term influence might be better applied. Still, it would not be the first time that terminology became a point of contention among scholars. Like many theories, environmental determinism did not have to be proven to be useful. Nor was environmental determinism fully developed as a positivistic theory that could systematically explain specific human relationships with the natural world. The theory of environmental determinism often relied on suggestive evidence that relationships existed between human and the environment. At time the evidence seemed as obvious as be *a priori* proof of the cause effect relationship between human activities and the climate, topography, vegetation, or other natural elements in which adaptation appeared to be required for survival.

In terms of the study of environmental determinism, problems emerged when attempting to apply positivistic approaches to issues stemming from personal convictions. The human behaviors that became associated with determinist perspectives also suggest personal biases. History contains many examples of applications of determinism including Eugenics, Social Darwinism, and phrenology. And, in more recent times there have been studies of twins who were separated at birth and tracked as part of a study to demonstrate the existence of the so-called social gene. These studies used what was considered good scientific methodologies at the time they were implement but by later analysis they have become paradigms of unethical
approaches that would not likely be permitted by modern standards. However, it is not likely that there will never again be any studies that attempt to define humans by their habitats.

The examples provided in this chapter demonstrate the complex ways the natural environment affects the human cultural environment and vice-versa. Each scenario begs the question, what would things be like if that particular phenomena had not existed? What would the world be like if no one had ever invented a saddle that could fit a camel permitting the beasts to carry heavy weights? What would Europe have been like if the mysterious Ghana gold had never been transshipped across the Sahara throughout the Middle Age? What would Indonesia be like if it had no volcanoes by which it has come to define itself? Each of these questions involved a deeper question of human adaptation to the natural environment.
CHAPTER 5

SUMMARY AND CONCLUSIONS

*Ingenio non ætate adipiscitur sapientia* (Lat. Wisdom is a gift of nature, not of years)

Summary

It was initially presumed that by conducting an extended review of environmental determinism insight could be gained as to how and why it seemingly failed as a theoretical school of thought yet the essential concept thrived in the popular imagination. Why it was inevitably abandoned by academia was found to be primarily the result of the following reasons:

1. Inherent teleological implications were contrary to the fundamentals of good science
2. The claimed cause and effect relationships were not always provable
3. It was really probability theory couched in the terminology of positivism
4. It was overwhelmed by too many expectations and exceptions
5. It became associated with racism, bigotry, and prejudice
6. It became associated with the eugenics movement
7. It became associated with Social Darwinism and discredited pseudo-science

Additionally, it was presumed that it could provide an alternative view on the history of environmental determinism as a phenomenon that has lived in the psyche of human cultural development since the first Neolithic humans began settling into organized social settlements. Further, like the writings of Herodotus, it was imagined that an approach that attempted to describe a wide variety of natural and cultural connections would reveal the true depth and range of underlying beliefs that led to environmental determinism. Some examples are perhaps more
targeted than others; all were deemed important to demonstrate the subtle qualities of the contributing beliefs. Therefore, like Herodotus’ crediting the Libyans good health as related to the water they drank (Chapter 2); many associations are necessarily anecdotal to show how theories are often derived from anecdotal evidence that was similarly a crucial element in the construction of environmental determinism.

The examples and scenarios that could have been included were virtually inexhaustible; however, an attempt to summarize certain aspects of environmental determinism led to choosing certain examples that appeared to imply the sorts of man-land relationships that may have been associated with beliefs like those of environmental determinism. Unfortunately, in order to conduct a study of a theory there was an assumption that the study had some intrinsic value otherwise what purpose would have there been in conducting such a study? The bias, therefore, is an essential element to the study and many examples were purposefully intended to support the contention that “humans are a natural product of their environment” (Harkavy, 1994, 1071).

The idea of a direct human connection to the earth has played a role in various popular beliefs that come under many different headings, including environmentalism, geographic determinism, nature versus nurture, and Social Darwinism. These and related beliefs gained powerful impetus from Herbert Spencer, who quickly embraced Darwin’s evolutionary theory and applied it to social phenomena to develop Social Darwinism. He also framed evolutionary theory in a manner that caught the public imagination when he coined the term “survival of the fittest” (Harkavy, 1994, p, 1072).

By the end of the 19th century, Darwin’s ideas had inspired numerous new perspectives that applied his ideas of natural evolutionary processes to social issues and cultural phenomena. Herbert Spencer provided the fodder for some of the earliest social-evolutionary perspectives
with his famous phrase “survival of the fittest” that quickly became the rallying cry and justification for the laissez faire monopolists who gained dominance over much of the American economic landscape during America’s industrial revolution. Meanwhile, Darwinism was applied to a wide range of social issues especially related to problems of urbanization. Even though the philosophy of environmental determinism had yet to be introduced to America, tycoons such as J. D. Rockefeller who proclaimed that the social issues of his time were not an evil tendency in business [but rather] . . . the working out of the laws of nature” (cited in Brinkley, 2003, p. 576).

It is helpful to draw an analogy with the Prohibition Era when increased crime and alcoholism induced the country to repeal the Eighteenth Amendment by adopting the Twenty-First Amendment. Certainly, there are still problems, but legalization provided taxable incomes to help deal effectively with the problems related to alcoholism. As any 16-year-old kid living in Mississippi during the dry days prior to 1970s could attest that it was much easier to get alcohol regardless of age when it was illegal than it was the case following legalization. Once legalized the systematic control of alcohol by taxation and licensing made it difficult for children to purchase alcohol.

The psycho-sociological implications of an unfounded belief can play havoc with the human mind when it spreads throughout an entire society. The legendary Cape Bojador provides an excellent example of a perceived natural peril that was widely feared among European mariners of the 15th century. In fact, none would venture beyond that notorious location off the coast of North Africa because it was believed the cape marked the edge of the world and to venture beyond was certain death. The presumed dire consequences kept generations of explorers from exploring any further along the coast of Africa. Before the notorious cape could be conquered crews would simply refuse to sail any further or threaten mutiny if the captain did
not turn about. Finally, in 1434 Prince Henry dispatched Gil Eannes to attempt the impossible which he did by sailing far out to sea before turning back toward the coast and then realizing that he had sailed beyond the cape. Among all the possible environments, it is the landscapes of the mind that present the most formidable determinants for human behaviors as the fields of psychology and sociology continue to demonstrate (Boorstin, 1983).

Contemporary scholars in the social sciences avoid terminology that suggests anything like environmental determinism in part out of fear of negative reactions. It is after all considered an obsolete issue. The fear is understandable – it is fear of the unknown. Like Cape Bojador, what danger lies beyond is considered not worth chancing, especially when the possible benefits are low. Investigations into human behaviors have been dogged by the thin line between post-positivism and determinism. As happened to the great historian, Arnold Toynbee, critics charged him with determinism which he was forced to defend vehemently. Nonetheless, it was a charge that put a cloud over his six volume history of the world that was published just prior to World War II.

The lack of consensus in applying an acceptable terminology to the idea of environmental causes in the development of human behaviors has only encouraged criticism. However, in spite of criticism, environmental determinism was never ousted completely and remains just below the surface of social commentary. There is considerable evidence that suggests the natural environment has played a powerful role in human development because so many human characteristics may be interpreted as rooted in adaptations to natural phenomena. If any behavior can be seen to help survival, then it supports such contentions. Yet, at the same time most social scientists tend to avoid such claims that the natural environment as the genesis the whole of human behavior because it runs counter to the idea of free will. It is difficult for scientists to
support any contention that removes such freedom of action from humanity. It does present a considerable conundrum from which no middle ground appears possible. It also points out one of the complex obstacles associated with social sciences. Science suggests positivism, while social suggests post-positivism – essentially two simultaneously different directions.

In some cases environmental determinism may appear as a reasonable explanation for events, in other perhaps less so; however, if it is of any use as a descriptive tool, it may have validity for retention among researchers. Curiously, there may be more negative assumptions based upon the terminology itself which gained notoriety with the passage of time. Subsequently, it became clear that less objectionable terminology could resolve some of the issues associated with environmental determinism. The most objectionable aspect of the concept seems to lie with the word *determinism.* The definition implies *certainty* while at the same time it is at odds with the numerous exceptions that apparently were of little concern to the early proponents of the theory. On the other had, exceptions are a common element found in many hypotheses and theories that have found applications though they do not work in every case. Some might say that there are always exceptions to the rules such that could represent a rule in itself.

Perhaps the most effective means to resolve the matter may be found in replacing the semantics that lay at the heart of the problem. But, what new terminology would work to replace environmental determinism. Previous geographers have attempted to instill alternate perspectives including, *possibilism, probabilism, environmentalism,* as well as, *environmental factors* and *influences,* to name a few. Exercises in semantics will no doubt continue, and rightfully so because it is a part of the systems of inquiry. But, it would not be right to throw out a potentially useful idea just because it has some negative associations as long as there remains any hope for its application to benefit investigations into social behaviors.
Examples of environmental determinism were originally situations in which the role of the environment appeared to be an empirical certainty. Such strong implications as Semple’s example of mountain passes as the most popular lair for bandits won rave reviews and many young adherents in the early 20th century geography curriculums. However, not every mountain pass was the place of banditry, so critics could just as easily find exceptions to the claims of environmental determinism as not. The concept determined then seemed too strong for something that was only true in some cases, some of the time. Thus, the environmental determinism movement was handicapped by the criticism over its label that implied such certainty for situations that was not true in every case. Semantics was likely the single most damning criticism and rightly one that it could never overcome.

Subsequently, if environmental factors frequently do play some causal role some of the time and only in some situations, then it stands to reason that addressing the problem of semantics would be called for. In fact, there were a number of alternative labels and adjustments of perspectives that were proposed including possibilism and probabilism. However, different labels contain much more than just words. Instead, the alternate labels induced entirely different perspectives each of which conveyed wholly different meanings and elicited their own critical cadres. Subsequently, the issue remains open to semantic proposals. As such, it seems clear that the terminology needed to fill the gap would be something that suggests bringing people together as an idea of this nature should. Cultures exist on commonality of ideologies and Sociofacts that are recognized and believed by the majority population.

The major problem with replacing environmental determinism is finding a label that both implies bringing people together, which is central to the concept of culture, while also implying the power of environment to cause or influence behaviors in people and cultures. In geography,
there is a concept that carries that connotation – bringing people together. The term is *centripetalism* which refers to the forces that pull people toward the center. It is typically used in describing the power of such things as national icons such as, anthems, national flags, and institutions that encourage some version of ethnocentrism. By putting such a centrist term together with environment would appear to be a possible candidate for the replacement of environmental determinism.

The final step: pasting together the concept of *environment* with the idea of commonality, like *centrism*, brings out the following possibilities: *environmental centrism*, *environmental centripetalism*, or *centripetal environmentalism*. Each of these possibilities suggests the necessary strength that is found in the concept of causation yet does not go quite as far as the very definitive concept *determine* as found at the heart of *determinism*. Centrism and centripetalism both imply the idea of bring things together, while environment and all its relevant factors, both social and natural, are proposed as a broader perspective the human surroundings that are at time difficult to distinguish between what is natural and what is not. Among the three choices, *environmental centripetalism* seems to sound scientific enough while conveying the meaning in which everyone is pulled together through adaptation to the natural and cultural elements.

This idea of replacing environmental determinism has evolved from this study in which the concept *environmental determinism* can clearly be seen to have become burdened by its notorious associations with Social Darwinism, bigotry, prejudice, and the associated Eugenics Movement of the 1920s and 1930s. While environmental determinism has become something of an anathema, still, the underlying beliefs continues to be a problem and remains a concept that has gained far too much negative socio-pathological baggage. Regardless, those problematic
beliefs have not diffused but instead have gone underground where they may be gaining an ever-widening array of new converts as evidenced by the growth of organizations like the Aryan Nation and other groups that openly preach the superiority of one race over another – to the detriment of us all. Those who subscribe to such antisocial philosophies continue to be communicated in the popular literature, and sometimes in covert ways such ideology is also conveyed in scholarly writings by using a plethora of justifications for their philosophy of hatred that promotes ethnic cleansing, to use a typical euphemism of the far right. It is recognized that while an alternate label may be needed, it is not so likely that it will catch on. Therefore, it is offered in the spirit of scholarly debate in the belief that through on-going discussions, greater understanding and accommodations can be achieved. Further, environmental centripetalism is offered as food for thought.

The promise of environmental determinism was in the belief that it was about establishing linkages between human behaviors and the physical surroundings. But, perhaps more important was the role environmental determinism played in the development of geography in curriculums of higher education in the United States. It was originally thought to be a tool for study of the spatial relationships between human behaviors and physical features. While the latter expectation was generally a failure, it was not a complete waste of time. As such, it may hold some potential for investigation and should not be ignored. Because there is still an enormous amount of work to be done in the social sciences every potential tool should be available for investigators use because many of the issues that were relevant to the geographic community in the early 20th century remain relevant today (Hartshorne, 1966).

While it seems likely that human nature contains elements of the physical nature; however, that is an area that is fraught with misconceptions and confusion. Therefore, some
middle ground may remain a possibility even if environmental determinism is never again associated with the mainstream consensus. Even the most critical scholars acknowledged that in certain cases it may hold potential for describing certain unique relationships among the multidimensional elements and factors that interact and contribute to the highly generalized concept of culture. In the effort to understand and improve communication all avenues of discussion must be available.

Conclusions to the Research Questions

1. What role has the natural environment played in the history of human evolution?

The Sumerian culture was a continuous expression of their environment, in their beliefs, in literature, and in the use of natural materials in which the arrangement and construction of their houses, like the adobe of Pueblo Indians maximized cooling effect in summer and warmth in winter. Ancient Greek cities provided a paradigm for population control based upon the carrying capacity of the landscape. Every culture and civilization has produced unique traits that contain practical methods for living in the natural world the forces of which are plainly axiomatic. However, with the exception of supernatural beliefs in nature gods, urbanized societies have typically been led to believe that their world has somehow altered the natural laws and that civilization has been at least partially freed from the power of nature. Periodically, natural disasters have intervened to remind humans of the fallacy of such thinking.

2. What if any natural laws apply to human behaviors?

Desert and steppe biomes produces plants that conserve moisture through tough waxy exteriors, desert cultures cope with the harsh environments by a number of adaptive methods. One way is to use domesticated animals as intermediaries in which the animals are suited to the ecological niche permitting them to eat the kinds of plants available and then in turn provide meat and dairy products. The Maasai are singularly unique in that they prefer not to kill and eat their wealth, in the form of their cattle, but instead take draughts of blood for nourishment. The dry Serengeti steppe is the stage, on which the limits are set, and by which humans must adapt to or die – thus adaptation is the essential activity that the natural conditions have set down and enforced.

3. What are natural laws and how do they relate to human behavior?

The physical laws that govern the universe, when misunderstood are the subject of myths; however, natural laws governing the daily lives of humans are also issues for survival. Such universal laws that directly impact people include the weather and climate, the resources produced by natural causes that may aid in adaptation such as building materials as well as
present challenges from which experience becomes the best teacher. The natural laws that rule
the heavenly objects such as stars, the moon, the sun, and the planets have been more than just a
fascination – together they are phenomena that promote spiritual development. While such
relationships between the human mind and the forces of nature are enormously complex, it is yet
certain that human societies are deeply affected. Societies have always interpreted natural
phenomena as more than something with which accommodation must occur, but nature has been
the sources of the cosmological beliefs that granted as sense of eternity that grants humans as
sense of hope and optimism that drives humans toward survival even when the natural forces
seem stacked against him. Nature spurs actions that become imbedded in traditions that are then
passed on by symbols and artifacts, such as language and icons that become important in the
building of cultures.

4. What human activities are subject to environmental conditions?

Cultures respond as a whole to climate conditions. Many styles are simple variations on a theme
that has some value in adapting to prevailing conditions whether it is rain, sun, cold, or hot.
While modern societies seem somehow removed from the natural conditions, still people wear
clothing that has been manufactured for specific purposes that is frequently in part an adaptive
response to weather and climate conditions. People live in shelters, carry umbrellas, wear hats
and coats, and use inventions for transportation that offer some protections from the elements.
Nevertheless, while it may be nearly on a subconscious level, the daily lives of urbanized,
civilized humans are constantly in active response to ever-changing natural conditions. Thus,
when nature throws some heavy precipitation, the ball game is “rained out” and one of the most
frequent topics of conversation is the weather about which everyone has an opinion, and no one
can accurately predict.

5. Why was environmental determinism restricted to consideration of the relationship
between the natural environment and human behavior?

As a theory, environmental determinism belongs to the social science side of geography rather
than the physical side because physical geography assumes the correctness of cause and effect
relationships. These are also known as deterministic, mechanistic, or positivistic relationships,
but they are generally provable by controlled experimentation. However, the social sciences are
less obviously much more complicated thus making it much more difficult to establish cause and
affect relationships. Spatial behaviors are the essential interest of human geography and the
questions of how humans survive in the vast array of challenging landscapes is a worthy topic for
study. While conditions may be similar between two places, humans often develop uniquely
different methods of adaptation which makes it sometimes difficult or impossible to make
accurate predictions about natural conditions and human behavior. But, like the profession of
meteorology, just because accuracy may be illusive does not mean that the effort should be
terminated. Further, living on so-called marginal landscapes provide some of the best examples
of how innovative humans are when it comes to survival in the most hostile environments.
Typically, when there is a dearth of natural resources available in the environment one may
reasonably predict that human settlement and growth will be scarce except as trade networks.
6. How was environmental determinism relevant to determinist perspectives in history, philosophy, religion, etc.?

The rise of the natural sciences in the wake of Darwin coincided with the Jim Crow era and led by the forces of the radical right racism became a substitute for Old South slavery when some states began passing segregation laws in the 1870s. Those with a moral conscience hated the idea of evolution; but ironically, they found support in idea of natural selection. With a twisted view of science, the moral compass of some educated people could accommodate their racist beliefs could draw on science, on natural selection, to support of their beliefs. Besides, racism even *de jure* support from the Supreme Court in *Plessy v. Ferguson* (1896).

Thus the antecedents to environmental determinism were ideas and beliefs. The religious forces could use the Bible to back up their racist agenda. The educated forces of racism could connect Darwinism to determinism via Spencer’s survival of the fittest. Finally, traditional perspectives on history provide a continuous stream of examples in which one people conquer and dominate another people. Had not historical events not sidetracked the era of Jim Crow America, was it likely that the United States was expanding its own version of the Holocaust through expansion of policies of racism and eugenics?

7. What role did environmental determinism play in the development of geography as a social science?

The positivism of physical sciences was the basis for environmental determinism. It was an attempt to apply scientific methods to geography as a social science. Though there were criticisms, the perspective helped garner attention for geography that helped it gain new disciples to the discipline that gained it access to the curriculums of higher education. As a result, geography was in turn granted a positive feedback cycle in which the more people attracted to the field of study, the more instructors were needed. As a science that had everything, except boundaries, geography eventually became a part of the core areas of liberal arts programs in many colleges and universities.

8. If environmental determinism had any acceptable applications, why was it repressed?

The Gaia Hypothesis that holds that the entire planet is one immense interactive and interconnected system in the sense of an organism has become very popular. However, the mechanistic perspective that is essential to environmental determinism is antithetical to the belief that humans are free agents who can choose at any time to take directions that are not in their bet interests, have no survival benefit, or are not practical from a survival perspective. Indeed, humans do seem to make choices that do not serve the interests of survival, and yet they still make such choices. Therefore, environmental determinism does not always make sense as an approach to the study of human behavior. However, it may still be considered one of many possible perspectives that can be used providing care is taken to understand its short-comings.
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