GENES, CLIMATE, AND CONSUMPTION CULTURE

Connecting the Dots

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Connecting the Dots

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INVESTOR IN PEOPLE

This book is dedicated to my writer, John Yow,
who is a brilliant storyteller and an
outstanding journalist.

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PREFACE

My interest in climate and its influence on consumption goes back to my first year college class on economic geography. The year was 1955. It was further reinforced when I specialized in European History with a specific focus on colonial expansion during my first two years of college (1955–1957).

However, all of this came into focus when I did research for Coca Cola International on why some nations consume a lot of Coca Cola and others do not. Ultimately, through statistical analysis, I concluded that all types of consumption can be explained by the North–South Latitude differences in climate ranging from the arctic to temperate to tropical.

What I learned from the Coca Cola study has been further validated by consumption differences in cheese, shoes, garments, and homes. In other words, differences in consumption of all three basic necessities of food, shelter, and clothing can be explained by the North–South climate differences.

More recently, I began to wonder whether cultural differences among nations about punctuality, territorialism, individualism, friendship, social distance, and uncertainty avoidance can also be explained by the latitude link. In other words, I could explain why Northern Europeans are generally more time and space conscious and why they believe in individualism, innovation, and pro-change.

It has been a fascinating journey for me since the early seventies and what I learned in my economic geography and modern history classes. The journey has not stopped.

I am now intrigued whether digital technology and social media will counterbalance influence of climate on culture and consumption or will it be moderated by climate. In other words, will warmer climate cultures be more engaged in social media than the colder climates? Will they have more family and friends on their social media apps such as Facebook, What's App, and Instagram as compared to colder climate cultures? Nobody knows for sure.

INTRODUCTION: CLIMATE AND THE HISTORY OF MAN

A few years ago, I was involved in a study for Coke International — then headquartered in New York. We were trying to figure out why consumption of Coke varied so widely from country to country. The differences were striking. When we analyzed the data from 55 to 60 countries, we found some countries were sipping Coke at a rate of only 64 bottles per capita annually, while others were guzzling 400 bottles per capita. Why?

We got a bunch of product managers together to come up with some themes.

The first hypothesis was "bad water." If a country had bad water, the people drank more Coke. We loved this one. It made good sense. Then the quiet guy in the corner spoke up. If water was so bad for the natives, they would have died long ago, and dead people don't drink Coke. Of course he was right; "bad" water is bad only for tourists. So we threw that one out.

The second theory was "affordability." Richer countries were the ones drinking Coke. So we ran the numbers, to see if per capita income correlated with consumption. We were surprised to find a slightly negative correlation. Poorer

countries were drinking more Coke than affluent ones. So this theory also had to be abandoned.

Third came the idea of "substitute beverages." We thought maybe whether a nation's attachment to its "native beverage" (i.e., beer in northern Europe, wine in the Mediterranean, tea in China) was strong or weak might influence Coke consumption. But what we found was that Coke consistently took market share away from native beverages, without a lot of difference from country to country. So this theory went out of the window.

It turned out that there were two actual explanations: one was climate, the other was age. If the country was warmer in climate and had lots of young people (low median age), then Coke consumption was very high. In countries that were "colder and older" Coke consumption was low. The lowest rate of consumption was in Sweden. The highest was Mexico, with 400 bottles per capita per year. This was even more than in America, with the exception of the four Deep South states Georgia, Alabama, Mississippi, and Louisiana, where the consumption rate topped at 600 bottles per capita. It occurred to me that climate probably also explained why, within the United States, consumption was higher in the South than in the North.

You say, "Of course. This is obvious. People in hot climates drink more of everything. They sweat. They're thirsty."

You're right. But as we puzzle out consumption patterns around the world, I believe we're often like those product managers, who perhaps did not see the forest for the trees. We're eager to investigate cultural factors, like religion, language, and social customs — or even genetics. The more I thought about it, the more I came to believe that we too easily overlook the pervasive influence of climate. It occurred to me that culture itself may be significantly shaped by climate.

Of one thing I was certain: In our increasingly global economy, with products and ideas flowing ever more easily from one part of the world to another, the question of who consumes what, and why, will become increasingly important.

And so I began this journey. I began by looking at the role climate plays in basic consumption (food, shelter, clothing), and soon found myself investigating how climate affects culture itself — that is, the cultural values that lie behind patterns of consumption. I must say, I have found these interrelationships quite fascinating. But before examining climate's influence on contemporary culture, let's take a brief look at climate's role in man's history.

THE EVOLUTION OF MAN

Let's begin with ice — or, more specifically, with the four Ice Ages of the Glacial Epoch.[1] For reasons that remain mysterious, at some point in our planet's past (maybe 35 million years ago), the climate began to cool. By roughly ten million years ago it's likely that the earth had cooled enough for glaciers to form in Antarctica, and perhaps elsewhere also. Finally, approximately two million years ago there came a period of very severe cold — the so-called Glacial Epoch — which probably lasted, punctuated by warmer spells, or interglacials, until roughly 12,000 years ago. Snow on northern mountainsides ceased to melt. Instead it accumulated, compacted into glacial ice, and began its slow drift toward lower elevations. At its worst, the Glacial Epoch saw sheets of ice covering much of the northern Europe, including the areas that would later become Dublin, north London, Amsterdam, Berlin, Warsaw, Kiev, Moscow, and Leningrad. In North America, ice covered most of what would become Canada

and extended as far south as St. Louis, Chicago, Cleveland, and New York City.

Anthropologists and climatologists generally agree that the gradual cooling of the earth during the Pliocene epoch (roughly 14 million years ago to 2 million years ago, leading up to the Glacial Epoch) offers a simple reason for man's evolution in Africa: it was getting too cold most everywhere else. Primates — the class of mammals which includes man and all of his ape-like ancestors — were originally tropical animals. In most cases (highly evolved *Homo* being the conspicuous exception) they still are. As such, their diet consists of easy-to-digest fruits, shoots, and buds, foods available only in a climate moist and warm enough to support such vegetation all year round. This essential requirement of a tropical climate immediately rules out North America, Europe, and most of Asia as potential birthplaces for man. It's true, as Robert Claiborne notes, that "fossil primates — including apes — have, indeed, been found in parts of Eurasia that are now distinctly cool, but the latest of them dates from a period some twenty million years back when these regions were still, at worst, subtropical; subsequently, we must infer, the apes were driven south or exterminated by the advancing cold and changes in vegetation."[2]

Plenty of fossil evidence attests to the existence of these tropical, tree-dwelling primates before the Pliocene. From this era, for example, comes *Aegyptopithecus* (Egyptian ape), whom Claiborne calls "the very first ape in the fossil record, and very probably the earliest creature that can with reasonable certainty be placed upon man's family tree." But then the story takes an interesting twist. For the 12 million years of the Pliocene, the African fossil record is a blank, and then, suddenly, toward the beginning of the Pleistocene (roughly three million years ago), fossils tell us that at least some of

the tree apes have taken up residence on the ground. What happened?

The answer, of course, is climate change. During the Pliocene, Africa, like the rest of the planet, was becoming cooler. At the same time, the African tropics were becoming drier, with seasonal rather than year-round rainfall. Consequently, the rain forest, the habitat of the tree apes, was shrinking. Our ancestors, if they wanted to survive, were going to have to climb down out of their Edenic tree-top sanctuary and think about going to work for a living. They were going to have to adapt, which, of course, they did — though we can suppose it was a long and difficult process. As Claiborne writes, the first ground apes had no great skills, as predators, scavengers, or vegetarians. "The only thing they were really good at, in fact, was doing many things inefficiently. They were masters of no biological trait — but jacks of many. In the course of some millions of years on the African savanna, they had begun acquiring what is unquestionably the most fundamental trait of man: adaptability."[3]

Not only the evolution, but also the migrations of early man were a matter of climate. Our ancestors probably made their way from South and Central to North Africa during the First Interglacial (i.e., between the first and second Ice Ages of the Pleistocene), when a climate warmer and wetter than today's would have driven summer rains into the Sahara far north of where they reach today.

To proceed from North Africa eastward into the Middle East, India, and Malaysia, early man probably had to wait for the Second Glacial. During the interglacial that allowed his trek northward in Africa, Malaysia would have had an Equatorial climate — fine if these migrating primates still lived in trees, but not so good for ground-dwellers. So it's likely that migration through Malaysia had to wait until a

new glaciation cooled and dried the area, transforming it into something like the ground-dwellers' preferred savanna.

But then, to continue his eastward migration from India and the Malaysian peninsula, man had to wait for yet another glacial period. We know that by about a million years ago he had reached the island of Java, and we also know that during an interglacial, as today, that would have meant crossing the Straits of Malacca and Sunda Strait. But based on his tools, Java man was far from sufficiently advanced to build the boats required for the crossing. We can only assume that he stayed put until glacial weather picked the moisture up out of the straits and added it to the advancing ice, allowing him to walk to Java on dry land.[4] About 500,000 years ago, another mild spell allowed man to complete his westward migration into northern Europe, where our Neanderthal ancestors settled in.

Let's jump ahead another 300,000 years to yet another migration-related question: Where did the original Americans come from, and when did they arrive? The prevailing answer is that America's first settlers arrived about 13,000 years ago, toward the end of the final Ice Age. They came from Asia walking across the dry bed of the Bering Sea, which like the Sunda Strait many years earlier, had sacrificed its waters to glacial ice — part of the worldwide "oceanic recession" that was the natural counterpart to the Glacial Epoch. Evidence for this theory has been unearthed at a site in Clovis, New Mexico. As Michael Parfit explains, "Stone can't be carbon-dated, but the dating of organic material found with the tools showed that the people who used them were in America no earlier than about 13,500 years ago." The story most archaeologists built on these ancient tools was of a people they nicknamed Clovis, who came into North America via Siberia, moved south through the ice-free corridor, then dispersed,

their descendants occupying North and South America within a thousand years.

But this theory has come under attack over the past decade. A find at Cactus Hill, south of Richmond, Virginia, has produced tools that may go back as far as 18,000 years, and another site — Rockshelter, near Pittsburgh, Pennsylvania — suggests that people may have been in North America 20,000 years ago. Such finds raise the radical possibility that the original Americans were not Asian but European; that they didn't walk across "Beringia," but rather sailed across the Atlantic.[5] Did the "oceanic recession" of the Glacial Epoch shrink the oceans so much as to allow passage by whatever crude craft might have been fashioned 20,000 years ago?

We're not likely to find that answer. But these climate-propelled migrations are fascinating to think about, aren't they? Compress an epoch into a season, and we see the same phenomenon in New Englanders headed to Florida to escape the harsh northern winter. Or we hear the words to the popular song:

> *Going where the sun keeps shining through the pouring rain Going where the weather suits my soul …*
>
> *Skipping over the ocean like a stone.*

THE RISE OF CIVILIZATIONS

Some writers are wary of attributing too much importance to the role of climate in the emergence of human civilization. Among them are Stephen H. Schneider and Randi Lander, who prefer this more cautious correlation: "The generally

benign climate that replaced the ice age [roughly 10,000 years ago] coincided with the rise of civilizations; perhaps it even fostered their development."

Yet even they make the obvious climatic concessions. In the Indus Valley civilization, for example, which arose in what is today the Rajasthan (or Thar) Desert of India and Pakistan, the inhabitants of Harappa were cultivating cereals 4500 years ago. These ancient people, write Schneider and Lander, "populated areas where irrigation was not possible and not needed; the rainfall provided enough moisture for their crops. Around 3700 years ago, the civilization faltered and declined rapidly" perhaps because of a changing climate and failing monsoon rains.

In China, higher temperatures helped push the range of some flora farther north so that bamboo groves became much more widespread. Bamboo was this civilization's "most important raw material; the young shoots provided food, while the more mature stems were used for construction, for making hats and other clothing, furniture and musical instruments, and for writing on."

The authors cite other civilizations, too, that blossomed along with the improving climate of the early Holocene (i.e., the present interglacial, beginning 10,000 years ago): the Sumerians (ancestors of the Southern Iraqis), who flourished in lower Mesopotamia some 7000 years ago and produced improvements such as the wheel and clay tablets with writing; the Minoans in the Aegean region, who emerged around 4400 years ago; and the Egyptians, Romans, and Greeks, who flourished in the Fertile Crescent, the cradle of western civilization. In a more direct acknowledgment of climatic influence, the authors note that while hunters and gatherers might have inhabited the southwestern United States 13,000 years ago, "they did not begin to sow the land until about

6000 years ago, when New Mexico and Arizona were [moister]."[6]

Civilization, of course, requires staying put, which requires agriculture, which requires water, which requires rainfall. Claiborne reminds us that desert soils next to great rivers — as in Mesopotamia, Egypt, and the Indus Valley — are ideal because they are renewed by flooding every year. In these places, with warm temperatures, plenty of water, and rich, silty soil, the land yielded more than the farmer needed. Higher productivity, abetted by easily maintained irrigation, further promoted the advance of civilization. It created leisure for the cultivation of nonmenial pursuits, and it created surplus food which could be traded to other communities.

In the Mediterranean, on the other hand, where the climate failed to promote irrigation, farmers specialized in grapes and olives, which thrived on the rocky, but sunny, hillsides. Such specialization necessarily fostered trade, and while they were at it, Mediterranean merchants were soon expanding their product lines to include things like Lebanese cedars and dried fish — which would vary the diet of inland farmers. (Claiborne speculates that the difficulty of preserving shellfish may well explain the Mosaic ban on their consumption. The Jews lived so far inland that any shellfish coming from the coast would surely be spoiled.)

As the Mediterranean climate promoted the production of specialized raw goods that necessitated trade, so trade encouraged manufacture: pottery, textiles, dyes, gold and ivory trinkets, tools, weapons. "By 1800 BC," writes Claiborne, "this process had produced along the Mediterranean coast the world's first truly commercial civilization populated by merchants, craftsmen, and sailors. It was the latter, who carried goods, and ideas, between the various civilized or quasi-civilized lands of the near East and who,

faring westward, bore the enticements and vices of civilization to new lands."[7]

CLIMATE AND HIGHER CIVILIZATION

Following his own argument to its logical conclusion, Claiborne suggests an even more far-reaching consequence of the climate-based shift from subsistence to commercial farming. In the Mediterranean world, as in most other places before and since, the subsistence-farming peasant was only marginally involved in civilization. He produced what he needed and otherwise stayed out of the way — and under the radar of the tax collector. On the other hand, the commercial farmer is tied to the city by the need to sell and buy there, and is therefore necessarily interested in what goes on there. Thus in Greece, as opposed to the Near East, for example, the notion arose that politics and civic affairs were the business of the average citizen, not merely of kings and nobles. It requires only another short step to suppose that this process advanced further and faster in the Athens region precisely because, being dryer than the rest of Greece, it was forced to rely more heavily on commercial farming — and, of course, on trade. With appropriate hedging, Claiborne concludes, "It would be a gross oversimplification to trace the burgeoning of Athenian democracy purely and simply to the effects of land erosion aggravated by the accident of a dryer local climate. Yet I feel there is a connection."[8]

Eminent climatologist H. H. Lamb might see the connection as well — particularly as he looks at the "climatic downturn" that persisted during the millennia just before the Christian era. Since the final retreat of the glaciers around 10,000 years ago, the climate had generally improved, reaching the so-called Climatic Optimum between 5000 and 4000

BC — an era when the world's weather was warm and wet, and generally benevolent to man and his undertakings. But from that point a cooling and drying trend set in. By 2500 BC, world temperatures were comparable to today's temperatures, but the trend continued for another 25 centuries. Lamb sees the final 15 of these centuries as a time of "disturbance," marked by sudden migrations: the Aryans from Iran to northwest India; the Dorian tribes into Greece; Hittites and Syrians raiding Egypt. The moving force behind this upheaval, he suggests, was drought. "In the case of Crete," Lamb writes, "we have the report of Herodotus that after the Trojan War the island was so beset by famine and pestilence that it became virtually uninhabited — conditions which certainly point to drought."

In asking themselves why, in the last millennium before Christ, the world had turned against them, perhaps these now civilized peoples were seeking the consolations of philosophy. "It may be of interest to notice," Lamb observes, "that it was in [this] last millennium that some of the great religions and philosophies of life and the world evolved." Deteriorating climate, upheaval, and migration may have signaled the kind of "breakdown of the old way of life and its ordered customs" that creates conditions conducive to the spread of a new religion.

For religious leaders and great philosophers, it was truly a remarkable millennium. "Buddha (563–483 BC) and Confucius (551–479 BC) each offered solutions to the universal problem of suffering in human experience. Confucius taught that all men are brothers and should sustain each other. The Buddha commended meditation to seek Nirvana, ultimately to reach a state of reconciliation to the terms of our existence and a serene view of pain and suffering. The period from about 600 to 536 BC saw the captivity of the Jews in exile in Babylon, accompanied by renewal of their

spiritual leadership and exhortations to get back to the laws that should govern life in the community, which had been laid down seven centuries earlier during another migration. And in Greece the middle and later centuries of the millennium were the times of the great philosophers, whose teachings influenced Christianity and all later European thought, leading on to the development of modern science and democratic debate."[9]

So, then, we have the climate to thank for human evolution, for the rise of civilization, for the development of Athenian democracy, and for the flowering of the world's great religions. Is that all? No. While the climate was driving the trade-based commerce of the Mediterranean, to the north it was watering the ground — literally — for the industrial revolution. Unlike the relatively dry Mediterranean, as Claiborne points out, the climate of Northwest Europe is wet: 2.4 inches of yearly rainfall in London, for example, compared to 0.9 inches in Rome. Prevailing winds off the ocean mean higher humidity. Rainfall comes in slow drizzles rather than torrents. All of which adds up to steadily flowing streams throughout the year.

Northwestern Europe, then, was a place ideally suited for a miller or millwright to set up shop, since he could count on a plentiful and dependable source of water power. In fact, according to William the Conqueror's *Domesday Book*, at the time of the Norman Conquest, England had no less than 5,000 water mills, meaning there had to have been at least one in virtually every hamlet.

With such an accessible source of power, argues Claiborne, the next obvious step was for medieval artisans to begin figuring out some of the other things a water wheel could do — like saw wood, operate trip-hammers to crush ore or forge iron, turn lathes, and run looms. "Long before Watt stared at his apocryphal tea-kettle," Claiborne writes,

"European industry was the most mechanized and the most power-driven in the world."

Moreover, the same water that supplied all this power also offered cheap and reliable transport. "The Seine and the Scheldt, the Rhine, Elbe, Oder, and Vistula, not to mention the Thames and the Severn … provided waterways for trade and commerce into the interior. Cheaper ways of moving goods meant better markets for goods, which set up the incentive for producing more goods, by devising more ingenious machinery which required ever more power."[10]

"WHAT CLIMATE GIVETH …"

In the first centuries of the Christian era, the climate began to improve again, with temperatures warming for roughly a millennium until peaking at the Little Climatic Optimum, or Medieval Optimum, from about 900 to 1200 AD. Among the interesting effects of this favorable turn in the weather were that oats and barley were grown in Iceland; English vineyards produced wine; locusts invaded Europe; and the Vikings got restless.

In 960, Viking settlers first arrived in Iceland. They were led by Thorvald Asvaldsson, who was forced to flee from Norway after having murdered a man. In what seems a remarkable example of genetic programming, Asvaldsson's son, Eric the Red, murdered two men in Iceland before fleeing to find his own land to settle. He sailed west, and in 982 discovered what looked like a suitable area on the southwestern coast of a land mass he named Greenland. The misnomer, according to Schneider and Londer, was intended to lure additional settlers — "an early example of a Heavenly Acres real estate swindle." Unlike Iceland, with its ample trees and tillable soil, Greenland, even during this "Little Climatic

Optimum," remained relatively harsh. Yet Eric succeeded in drawing settlers, who managed to raise vegetables, hay, and livestock. At its zenith, the population reached roughly 3,000 people, inhabiting some 280 farms.

But then the climate began to cool again, and the sagas documenting the Greenland settlement indicate that the route there began to be blocked by drift ice. Ships were forced to detour further and further south before they could swing back up to the coastal settlements. Eventually ships from Iceland could no longer complete the journey, and the Greenlanders were cut off. Even Schneider and Londer, who prefer to find nonclimatic factors behind historical events, admit that "the cooling climate most likely did contribute to the Greenlanders' demise. It destroyed their ability to grow sufficient crops and inhibited the growth of trees from which they could have built ocean-going boats, which probably explains why they did not simply sail away when conditions worsened. Today, the site of Eric's settlement is largely barren tundra."[11]

Or consider the Irish potato famine of 1845–1850, which can be blamed to a considerable extent on the same dependably wet climate that at the same time was fostering northeastern Europe's industrial revolution. H. H. Lamb reports that the blight arrived in a ship load of potatoes from Latin America to Belgium and "was wafted to Ireland by easterly breezes in July and August 1845." In that year, three-fourths of the potato crop was destroyed in Belgium and Holland, too, but in Ireland, overpopulation and poverty turned the situation into a catastrophe. Moreover, writes Lamb, "Ireland's position on the edge of the Atlantic, where the southerly and southwesterly winds are warm and especially humid, meant that the disease recurred, to devastate the crop in several successive seasons, whereas in 1846 a much drier summer saved most countries farther east." The result was "a

population disaster … in which climate played a key part": millions of deaths and forced migrations that reduced Ireland's population nearly by half.[12]

Or, in our own time, consider 1972. This one remarkable year brought drought to the U.S.S.R., India, Southeast Asia, Australia, Latin America, and the Sahelian region of Africa. It wiped out the Peruvian anchovy fishery. It depleted grain supplies around the world, resulting in soaring food prices, and worse, famine that eventually killed or displaced tens of millions of people. A million deaths in India and Bangladesh alone were attributed to this "bad weather year."

Schneider and Londer take a closer look at what happened to the Peruvian anchovy fishing industry, "since it is a good example of climate becoming hazardous to food production and an excellent reminder that the oceans are a significant part of the climate system." In that year, thanks to "El Nino," the temperature of Peru's coastal waters rose by several degrees. El Nino disrupts the process by which cool, deep ocean waters well to the surface, bringing with them oxygen and rich nutrients. The warmer, nutrient-poor water results in a decrease in plankton blooms, and in the absence of plankton, the anchovies, higher up the food chain, swam off, failed to spawn, or died. What had been considered an inexhaustible source of protein, not to mention a staple of the Peruvian economy, was suddenly gone. "In 1970," write Schneider and Londer, "Peru's anchovy catch reached a record high of 12.5 million metric tons. But within three years the catch had plummeted to less than 2 million metric tons. After a brief recovery to about 4 million metric tons, the catch dropped off even further by 1977 to less than 1 million metric tons…. This major fishery has shown few signs of recovery, and some wonder if it ever will."[13]

Finally, in the interests of fairness, if we are going to assign climate a role in the rise of Athenian democracy, let's consider

that it may just as easily have a contrary effect. For that we travel to "the driest place on earth": Chile's Atacama Desert.

According to Priit J. Vesilind, the arid climate helped spur the desert's first period of development, when "in the 1830s, prospectors found surface deposits of caliche, a raw nitrate formed over millions of years. Without vegetation to absorb it or rainfall to flush it away, the 'white gold' encrusted much of the desert's surface." Since Europe needed nitrates for the production of explosives and fertilizers, British and European mining companies came to the desert to set up shop. By the end of the nineteenth century the nitrate business was booming, supplying Chile with half its national income.

But when the nitrate supply was exhausted, the boom ended, sending thousands of Chilean workers, now jobless, back to the cities. Angry and disillusioned by their callous treatment at the hands of their British overlords, these workers embraced communist ideology and elected as their leader the Marxist, Salvador Allende. Allende's efforts to help his constituents by redistributing farm lands and nationalizing industry led to his overthrow by General Augusto Pinochet's military coup,[14] thus setting up a form of government even further removed from "Athenian democracy" than Allende's Marxism, which at least came through free elections.

Well, maybe it's a stretch to say that the climate in the Atacama Desert brought about General Pinochet's military dictatorship.

But what, exactly, can we say?

THE CLIMATE IS ... THE CLIMATE

Was climate responsible for the rise of man or the advance of civilization? Was climate responsible for Noah's flood or for the plagues of Egypt?

Perhaps we are not putting the question quite right. Man, like all other species, intends to survive, and the climate simply constitutes the field on which that battle for survival will continue to take place. It is the air we breathe — whether dry or wet — and the food we eat — whether scarce or abundant.

As I hope to show, climate touches us, impinges upon us, in myriad ways — some obvious and some less so. To pick up the metaphor again, it determines the armor we choose in our battle for survival — including what we eat, what we wear, and what we use for shelter. Furthermore — and perhaps more radically — Part Two of this book will analyze how climate helps shape the cultural values and attitudes that lie behind those fundamental consumption choices. That is, we will discuss not only how climate determines what we consume, but also how climate helps define who we are.

NOTES

1. Some climatologists prefer to divide the Glacial Epoch into more than four distinct Ice Ages. But let's agree with Robert Claiborne that four is a convenient number. Claiborne's *Climate, Man, and History* (1970) provides the general background for my discussion of climate's role in the history of man.
2. Claiborne, pp. 142–143.
3. Claiborne, p. 170.
4. Claiborne, pp. 181–182.
5. Parfit (2000, Dec).
6. Schneider and Londer (1984).

7. Claiborne, pp. 298–299.
8. Claiborne, p. 333.
9. Lamb (1982, 1995).
10. Claiborne, pp. 369–370.
11. Schneider and Londer, pp. 111–112.
12. Lamb, p. 16.
13. Schneider and Louder, pp. 390–391.
14. Vesilind (2003, Aug).