CHAPTER 2

Ellsworth Huntington's Victorian Climatic Writings

1 Ellsworth Huntington's Climate-Colored Glasses

Descended from Puritan stock migrating to Plymouth in the seventeenth century, Ellsworth Huntington was born in 1876, the son of a clergyman. From that Puritanical stock, he inherited a measure of compulsion, and also that people's penchant for keeping account, and taking oneself to task through journaling. This ancestral habit, together with elements of modern record keeping and scientific notation, yielded field notes, at once prolific and meticulous. These many notes became as many publications. When Mrs. Huntington donated her husband's papers to *Yale University Library*[1] in 1968, they spanned 135 linear feet, being comprised of 28 books, parts of 29 others, and more than 240 articles (Martin 1973). Huntington had much to say. He was an underpaid Yale University research associate, thinking, writing, and theorizing on the fringe of the geology department prior to geography, his own discipline, having attained to full recognition. It may have been precisely from this tenuous position that much of his productivity came, for it at once rendered Huntington impecunious and interdisciplinary. As did Washington Irving, Charles Dickens, Alexandre Dumas, and many another author, Toynbee wrote his way out of straightened economic circumstances. More importantly, not being ensconced within an established discipline, he was not entangled in its conventions. Representative of many another student that had the advantage

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of becoming personally acquainted with Huntington, Arnold Joseph Toynbee, the comparative historian featured in Chapter 8, remarked, "Huntington had a mind that perceived the possible connections between things that pedestrian minds, plodding along in blinkers, overlooked"[2] (Martin 1973; foreword by Toynbee).

Long before, Huntington distinguished himself as a student, but was far from satisfied by achieving within established forms. By the time he was twenty-one, Huntington evinced implacable wanderlust that eventually took him across many a continent and country. In his travels through Asia Minor, one can see an eclectic combination of experiences, not likely to be gained by a single academic in the present. For example, one of Huntington's official missions was to find reed beds, topography, fossils, and related markers of bygone moisture in demonstration of climatic changes. In doing so, he recalled a harrowing experience in which his party secured a watering hole in the desert, ransoming access to it for the bread of another party. He often managed natives in his employ and learned from them, while more generally the logistics of these surveys necessitated his becoming acquainted with the peoples and cultures of each region he visited. In the early 1900s when Huntington was conducting his most intensive fieldwork, the Modern West was equipped with rails and roads, but Huntington preferentially studied the geography of Africa, Asia, and the Middle East where transportation still relied on pedestrian and animal power. As such, Huntington became as much anthropologist as geographer.

Over a long career Huntington's irrepressible intellectualism was brought to bear upon the Caspian Sea (1907), the Arabian Desert (1912a), Asia (1912b), tropical America (1914a, b), Australia (1920a), Korea (1920b), Mexico (1920c), Northern Europe (1922a), China (1925a), Russia (1925b), and Iceland (1943). Only the subjects of his investigations were more varied than the region; for indeed, Huntington studied race (1915, 1924a, 1932), economics (Huntington 1916; Huntington et al. 1933), agriculture (Huntington and Cushing 1919), statistics (Huntington and Cushing 1920), business (Huntington and Williams 1922), peat deposits (1922b), sun spots (1923a), epidemics (1923b), suicide (1925b), non-random migration (1927), paleoclimate (1913a, 1925c), dendrology (1913b), eminence (Huntington and Whitney 1927), not to mention civilizational decline (1919a), the dysgenics of war (1919b), cranial volume, and cognition (1919c). Huntington (1938) devoted a book-length treatise to the single subject

of seasonal differences in births as they regionally varied, a topic previously addressed by anthropologist *Edvard Westermarck* and statistician *Corrado Gini*, and which has lately been revisited by Martinez-Bakker et al. (2014). Also, he wrote extensively on eugenics in the 1930s and 1940s (Huntington 1935). Moreover, Huntington investigated maternal aging as it affects offspring sex (1938) in such a way that conforms with the *Willard-Trivers Hypothesis* wherein high maternal condition[3] relates to male-biased births (Cameron 2004; Almond and Edlund 2007). Further still, Huntington conjectured on lifespan and sex ratio, while at the same time discussing intelligence and eminence, criminality, longevity, parasites, and weather; much else that is the stock and trade of contemporary life history theorists. These are not juxtaposed randomly; Huntington was sensing some deep underlying connection between such variables.

2 Mapping the Distribution of Civilization

Except in the most obscure works, despite the region or topic of study, *climate* was the great theme of Huntington's life.[4] Tenacity of pursuit was paired with talent, making for a presciently sophisticated study of climatic variables (Huntington 1944) as they related to human populations. Huntington expressed keen interest in paleoclimate, inoculating him from the assumption that present and past climate approximated one another. In *World Power and Evolution*, he devotes numerous pages and presents several graphs relative to this topic, which are then paired with informed speculation as to how more favorable conditions of the past could have precipitated heights of social complexity. For instance, he addresses the auspicious climate occurring in fourteenth century Italy, noting that this stimulated the forerunners of fifteenth century Renaissance masters (Huntington 1919b). Other nations and regions, before and after, showed similar, but short-lived, efflorescence. This *march of civilization* was like a program running in the background of Huntington's mind for decades, until he wrote pointedly on the subject in *Climate and Civilization* (1924b) and thereafter in *Mainsprings of Civilization* (1945).

Also, ever aware of the effects of migration, Huntington wrote of the "active evolution" that "has been the case in higher latitudes and more variable climates" (Huntington 1927; p. 50). At the same time, he recognized the curvilinear effect of latitude, as seen in his discussion of,

for instance, herding peoples living far north in the range of the Arctic Circle wherein winter is almost *unbearably miserable*. Huntington was correct; there is a fair amount of human biodiversity existing among human populations, especially those separated by major geographical features. He was correct also in associating this biodiversity with: (1) location, (2) landforms, (3) water bodies, (4) soil and minerals, in addition to (5) climate. Directly after describing these aspects of what a modern researcher would call *physical ecology*, Huntington, along with Cushing, wrote of a climate's associated plants and animals in what amounts to a delineation of *community ecology* from *physical ecology* (Huntington and Cushing 1922). For instance, Huntington (1919b) references the rainfall, soils, temperature, and related physical ecological variables that determine whether one will find "the moss and lichens of the barren tundra," the vigorous forests of Appalachia, the "orchids, twining vines, and mahogany trees" or the "grasslands…in the plains and deserts in the western cordillera." Pathogens and parasites are joined to plants, as Huntington further explored his implicit understanding of community ecology:

> The parasitic phase of climatic influences includes all diseases which are due to parasites or viruses, and which have a distinct regional distribution by reason of climate. Malaria, yellow fever, African sleeping sickness, yaws, pellagra, hookworm disease, and the more severe forms of dysentery are examples of diseases that are found mainly in the warmer portions of the earth because those are the regions most favorable to certain parasitic organisms and their carriers. (Huntington 1938; p. 21)[5]

Beyond relating physical ecological variables to the community ecological variables to which they give rise, Huntington considered climate as it variously imposed constraints and afforded opportunities to mankind during the Neolithic revolutionary transition to sedentary agriculture.

Huntington understood climate, along with the plant and animal life that it engendered, and which alternately helped and hindered mankind, to ultimately explain the distribution of civilization. Pursuing that theme, and in an effort at impartiality, Huntington enlisted the expertise of 213[6] persons, of whom twenty-six Americans, eight British, eight continental Europeans, seven Latins, and six Asians participated by placing 185 slips of paper with country names on them, into one of ten envelopes, forming an ordinal hierarchy of civilization. These responses were compiled and converted into an ordinally tiered *Distribution of Civilization*

(Martin 1973; p. 113). In that map, *civilization* is concentrated in Western Europe and diminishes as one progresses across Eastern Europe through the interior of Asia, before rising to high heights in Japan. There are pockets of *high civilization*[7] approximately near Argentina and within South Africa, but mostly they are restricted to East Asia and portions of America and Australia settled by the English. Alternatively, *low* and *very low* levels of civilization predominate at absolute latitudinal extremes, corresponding to the tropics and tundra.[8] This comports to Huntington and Cushing's (1922) presentation of eleven climatic zones, which were thought to differentially support civilization. Therein, among so much else, one will find complex considerations of the salubriousness of temperate forests, alongside details on the poverty of tropical soils.

3 Mapping the Distribution of Life History

Huntington's mapped *Distribution of Civilization* is no doubt a cacophony of error, bias, and ethnocentrism. For all that, it is of profound interest in that it would very likely correspond with broad continental clusters of life history speed, were it likewise mapped and superimposed.[9] How did this distribution come about? Only in its totality can this book begin to cobble together an answer. In due course, we will expose causal connections, for example, with soil and agriculture in Chapter 4, mortality regime in Chapters 5 and 9, population density in Chapter 6, family organization in Chapter 10, and mating practices in Chapter 11. Before more doggedly pursuing the question of *why* life history varies between populations distributed across locales, latitudes, and continents, it is here necessary to establish that it does so vary; to establish the basic fact of our immediate thesis: *50,000 years of post-migration evolution in Eurasian climates created life history variation across continental populations, which, in some measure, underpins the above-mapped tiers of civilization*.

Huntington died before life history theory was born. Huntington stressed direct effects of climate on individuals[10] in the vein of van der Vliert (2009). Nevertheless, he clearly divined evolutionary responses (Huntington 1929), as when he stated, "…throughout the thousands of years which brought about these changes, all the races apparently retained the indelible constitutional impress of the climate of their common birthplace" (Huntington 1919b; p. 9). Nevertheless, he often separated evolution from climate,[11] seeing them as separate, rather than searching for the ways in which climate created a selective regime, which, in turn, altered an evolutionary trajectory. Lamentably, evolutionary

responses to post-migration evolution into Eurasia remain misunderstood and underappreciated within all social science disciplines. Too often, differences in civilization are assigned to culture (Lowie 1917), in a process of circular reasoning. Where ecology is judiciously considered as an impetus, direct effects on individuals are emphasized above evolutionary responses within populations. The absence of life history evolution from explanatory narratives remains an impediment to progressing toward a biological reckoning. Only with it, one can see how approximately fifty thousand years of evolution could have produced biological differences from which variegated civilizations are *partially* wrought. As detailed subsequently, migration did not simply proceed slowly within the Upper Paleolithic Era, with temperature targeting traits piecemeal, rather it accelerated into the Neolithic Era, with an utter inversion of selective pressures operating on the life history complex as a unit.

The ecologies of Africa and Eurasia contrast starkly, such that, with migration, one set of selective pressures waned, while a new set of selective pressures waxed. In combination, the selective regime turned suddenly, not like a car, but like a skid-steer or tank, the wheels or tracks of which run in opposite directions. More precisely, the northerly migrant to upper Paleolithic Eurasia suffered from *migration load*, as he coped with seasonal cold imposed by the physical ecology; but at the same time benefited from *ecological opportunity*, as he was relieved from the parasites and pathogens that were such deadly components of Africa's community ecology (Hertler 2015). Physical, anatomical, cognitive, and behavioral traits which had previously been adaptive and remunerated by natural and sexual selection were, in some cases, ill-suited for this new environment. Some traits became superfluities that northerly environments failed to actively maintain, but which nonetheless were not harmful to their holders. Other traits became actively maladaptive and were quickly selected against.

At issue is then the speed of response to the above described inverted selective pressures. Huntington believed that Darwin overemphasized gradualism,[12] as well he may have (Garland and Rose 2009) from a combination of circumspection and humility. Similarly, later evolutionists have overemphasized gradualism in response to incredulous disbelievers, Neo-Lockeans, the stir of Gould's *punctuated equilibrium*, fears of biological determinism, and a lay reluctance to accept evolutionary thinking applied to human behavior. Compounding the error is a related fiction whereby human evolution purportedly ceased. In that view, the

Environment of Evolutionary Adaptedness was located somewhere in the distant past (Woodley of Menie and Sarraf 2018). For some, that past was prior to settlement, when all humans lived in hunter-gatherer bands; for others, it stretched back 100,000 years or more prior to migration out of Africa. Through the work of Lynn (1991) and Rushton (2012), we now understand that an enormous amount of evolutionary change has occurred following migration into the colder climates. Additionally, *The 10,000 Year Explosion* (Cochran and Harpending 2009) and related works (Scott and Turner 2000; Wills 2011; Jablonski and Chaplin 2000) demonstrate the acceleration of evolution thereafter. The civilizations and cultures that humans create decidedly do not obviate further adaptation; instead, they represent complex anthropogenic selective regimes that accelerate the evolutionary process along a range of trajectories. Like a prism that breaks white light into many colors, the complexities of civilization manufacture many more niches, into which variegated types evolve (Armstrong et al. 2014; Woodley et al. 2013; Woodley and Fernandes 2014).

At present, we have established two points: First, African and Eurasian populations faced very different selective regimes, wrought by extremely different physical and community ecological features, and second, evolution proceeds apace much more rapidly than is generally appreciated. To these two points, a third must be appended. Having established motive and capacity, this third point pertains to method. To understand the method by which humans evolved, one must replace *massive modularity* with life history. Massive modularity refers to each aspect of human cognition and behavior being *modular*, meaning independent. To the extent that human behaviors are independent of one another, it would be difficult to envision post-migration evolution creating population-level variation across so many traits, and the culture at large. Life history theory solves this problem. These behaviors and traits are not in fact modular, but are instead part of the life history complex. When the life history complex slows, all constituent traits, to greater and lesser degrees, change in a recognizable direction. Thus, there is no need to posit a mass of separate mutations across the genome that independently arose and were independently preserved in reaction to a range of selective pressures. Instead, life history is an integrated complex on which every population varies. Eurasian selective regimes non-randomly preserved and perpetuated somewhat more *sLH*-selected migrants, and thereafter, increasingly *sLH*-selected inhabitants of future generations.

4 The Life History Response to Eurasian Ecology

In supporting all that went before, Phillipe J. Rushton's work is of immediate relevance. Rushton (1985) is the founder of *Differential K Theory*—the first systematic application of life history theory to understanding differences between human populations. Rushton's *Race, Evolution and Behavior*,[13] a book summarizing a decade of his research backed by approximately one thousand references, demonstrated that *Mongoloid* populations had the most extremely *sLH*-selected population mean, with the *Negroid* mean being most *fLH*-selected and the *Caucasoid* mean being intermediate.[14] Therein and elsewhere, one finds, among other variables, population differences across what have come to be known as *biodemographic, psychosocial, and psychological* life history traits (Figueredo et al. 2004, 2013, 2014). Looking to individual traits, migration evoked forward thinking, planning, impulse control, and other cognitive-behavioral forms of executive control. Population mean intelligence, conscientious action, future-oriented preparation, and parsimoniousness inclined, while parental effort outstripped mating effort, monogamous pair bonding preponderated over polygynous harem formation, and reproduction, instead of taking place early and often, was deferred and moderated.

Though Rushton's research defies condensation, for the sake of example, consider life history traits associated with mating effort. Native Chinese, Japanese, Korean, and related *Mongoloid* populations show behavioral signs of reduced mating effort in their low rates of sexually transmitted disease,[15] intercourse frequency, extra-marital copulation, extra-marital births, and extra-marital affairs, as in their late age of first intercourse and late age of first pregnancy (Rushton 1988, 1999a, b, 2000). These behavioral differences might be readily assigned to purely *cultural* origins, save that they are paired with evidence of reduced prostate cancer (Santner et al. 1998), genital size, combined testes weight (Dixson 2009), skeletal muscle mass (Rushton 2000; Silva et al. 2010), and twinning rates (Rushton 1996), which are evident alongside restricted beard growth (Santner et al. 1998; Wu et al. 2012), sperm counts (Iwamoto et al. 2007; von Eckardstein et al. 2001), and functional testosterone expression (Lookingbill et al. 1991; Zitzmann and Nieschlag 2001; Greaves 2001). These data were cataloged in Hertler (2015), wherein their significance as markers of mating effort is established in a comparative psychological review. In turn, mating practices,

and their underlying dispositions, have profound implications for family organization and the organization of civilizations, topics that will be pursued in Chapters 10 and 11.

Whether aggregated on the *fast* or the *slow* end of the spectrum, the coordination of life history traits imparts coherent life strategies, the *ultimate* evolutionary logic of which can be appreciated. In closing, we look ever so briefly toward candidate *proximate* mechanisms theoretically responsible for producing coordinated life history responses. In insects (Travisano 2009) and bacteria (Zera and Harshman 2009), there is experimental evidence of life history change in coordinated response, coordinated responses that are hypothesized to relate to regulatory genes which have downstream (Lande 1982; Flatt and Heyland 2011; Muehlenbein and Flinn 2011), *pleiotropic* effects on *reaction norms*, growth rates (Stearns 1989), and also degrees of *neoteny* and *paedomorphia* (Hawkes 2006). Correlations among life history variables are also maintained by bioenergetics tradeoffs, wherein investments in one area necessitate compromises in other areas (Calder 1984; Charnov 1993; Braendle et al. 2011; Hill and Hurtado 1996/2011). Lastly, there is strong evidence that evolution acts on the production, or sensitivity to, hormones (Dowling and Simmons 2009; Réale et al. 2000; Zera and Harshman 2001; Flatt et al. 2005), with effects on developmental speed, senescence rates, reproductive (Rushton 2000), and developmental schedules (Finch and Rose 1995), all of which comprise the stock and trade of life history theory.

Notes

1. Yale provides the following online catalogue, guiding interested readers to some of these many materials: http://drs.library.yale.edu/HLTransformer/HLTransServlet?stylename=yul.ead2002.xhtml.xsl&pid=mssa:ms.0001&query=india&clear-stylesheet-cache=yes&hlon=yes&big=y&adv=&filter=&hitPageStart=176&sortFields=&view=c01_18.
2. As discussed by Martin (1973; p. 239), by the 1930s, the maturing discipline of geography *slipped past* Huntington, as he was increasingly a grand generalist amidst precise specialists.
3. Maternal social dominance has more lately come to the fore as an addition predictor of male-biased sex ratios within the Willard-Trivers Hypothesis.
4. Martin speaks of Huntington's controversial position among peers within the then emerging discipline of geology. He was, and continues to be (Lewis 2011; Livingstone 2011), attacked as a determinist, and for

various other positions he held. Nevertheless, Martin points out that his body of work defies the critic who would select a single sentence, paragraph, chapter, or book, and denunciate on its basis. Martin has digested Huntington's writings *en masse* and notes that they defy distillation in piecemeal. Only by reading through many of Huntington's works, in other words, can the reader begin to grasp at Huntington's grand themes and contextualize the meaning of any particular. Unfortunately, Huntington's frank style and bold theorizing invited attack. He would properly disclaim the tentative nature of his theses, but thereafter support them to the utmost. Consider also, Huntington's implicit refutation of the charge, embedded within musing on his intellectual evolution:

> … Although I am primarily a student of environment I am gradually coming to the conclusion that at any given moment inheritance is more important than environment. But of course inheritance owes much to past environment through the selective action of that environment and perhaps through its direct effect in causing mutations. About ten years ago I came to the conclusion that I was growing one-sided. I started life as a firm believer in the idea that the world's salvation was to be attained through education, religion, good government, and social reform. Then I studied physical environment and health, and was switched from cultural to physical environment. At that stage I began to study genetics and the results of recent biological research. The result is a book now in press called The Character of Races, and a firm conviction that any man who asserts that either inheritance, physical environment including food, bacteria, climate, etc., or social environment including all the cultural elements is more important than the others is talking through his hat. Each is essential just as air, drink, and food are essential to human life. Thus from my point of view the man who ignores or minimizes the importance of race and inheritance weakens my confidence in his judgement just as does the man who ignores the importance of health, or of social organization. (Martin 1973; p. 203)

Similar statements can be found in the preface to *World Power and Evolution* (Huntington 1919b; p. 8), in *The Character of Races* (Huntington and Whitney 1927; p. 286), and in *Season of Birth* (Huntington 1938; p. 439).

5. Huntington goes on to contrast the above with the epidemic disease of temperate regions.
6. Of the 213 solicitations, 137 replied, but only 54 participated fully as per Martin (1973).

7. This is the first of many times that the term, *high civilization*, appears in this volume. This precise term, or some variant thereof, is employed by several featured authors. It may mean something somewhat different to each author, but, as for our interpretation, it is circumscribed. Alike eschewing value judgments and hierarchical arrangements, we see it only as reflecting complexity.
8. Akin to a societal version of Maslow's hierarchy of needs, Huntington identifies climatic allowances for abundance to support the luxury of teachers, scientists, artists, and clergymen (Huntington and Cushing 1922). Huntington recognizes density as a precondition to advanced civilization. Only with sufficient density can people combine in the formation of law courts, museums, schools, and churches. This concept will be discussed at length in subsequent chapters, such as Chapter 4 featuring Baker.
9. Where Huntington no doubt saw high and low civilization along some hierarchy of development, life history variation, though it might overlap, would simply map differential adaptation. There is no good or bad life history speed, only ecologically induced variation.
10. For a moment, it seems that Huntington might draw Lamarckian lessons from epigenetic observations of egg development, but his later discussion of toads puts this to rest. He notes that experiments with toads show much the same findings, in that an acquired characteristic (Huntington does not use the term) is inherited. Before moving on, he ascribes this to the eggs within the mother having been exposed to the same temperature as the mother herself. Later, Huntington continues in the same vein, this time reviewing mammals. He notes that longer tails and larger feet seem to be induced by mice gestated in hot conditions. He seems not to consider changes induced via gestation to be adaptive. Instead he seems to consider them simple differences and infers that they are developmentally instilled; making here implicitly the distinction between genetics and the building of a body according to a genetic blueprint. In a later work, Huntington returns to observations of what may well have been epigenetic phenomena: "We may be dealing with what Martin (1973) called 'temporary inheritance.'" Huntington continues, summarizing Martin's findings: "He suggests that, if a certain response to an environmental condition is repeated often enough, the capacity to respond increases, and may even be transmitted to offspring" (Huntington 1938; p. 445). However, here, epigenetic observations lull him into Lamarckian assumptions: "I cannot enter into the matter further here, but many of our facts seem to fit such an hypothesis better than the more orthodox belief that new qualities arise only through mutation and selection" (Huntington 1938; p. 446).

11. Cabeza de Baca et al. (2017) recently critiqued van Lange et al. (2017) climatically inspired explanations of violence for failure to distinguish between levels of causation; in other words for failing to specify whether certain climates potentiated the evolution of violence, or simply fostered violent behavior within individuals only so long as they continue to experience those climatic conditions. The same criticism could be leveled at Huntington. In many a passage, one is not certain whether he is referencing evolved or facultative responses to climate. However, there are some passages where he clearly does endorse either evolutionary or facultative responses. So he certainly believed in both responses, leaving uncertainty only as to what degree of importance he placed on each level of explanation.
12. Huntington (1919b) discusses Darwin on page 148 of *World Power and Evolution*. It is therein that Huntington charges Darwin with having overemphasized gradualism. Though the error is supportable, Huntington's alternative is not. Huntington put his stock in mutations. These he thought were responsible for the creation of diversity. Now this is no doubt true; all variation ultimately comes of mutation. However, at least in *World Power and Evolution*, Huntington creates a view of evolution wherein mutations spontaneously arise and are selected for and against based on climatic factors and related selective pressures. Again, this is of course true, but where he errs is by failing to combine this with a parallel process wherein existing variation is non-randomly selected to the end of creating directional selection and evolutionary change within the population. Of course, it is difficult to impute this or any misunderstanding to someone as prolific as Huntington, as Martin (1973) warns.
13. Rushton's initial work, as is said, focused on life history differences expressed across human populations. However, Rushton and collaborators, as well as other researchers and research groups, went on also to describe life history variation within populations; such research will be presented in later chapters.
14. Rushton was aware of fine racial and regional differences within more discreet populations, though, possibly in connection to past data collection practices, he used the following broad groupings: *Mongoloid, Caucasoid*, and *Negroid*. In addition to these terms having an anthropological history, available data sets that Rushton used did not consistently use population distinctions that were more finely variegated, leaving him to employ these essentially continental-level distinctions.
15. As was said in Hertler (2015), "it is important to note that rates of sexually transmitted disease (STD) may provide a proxy for rates of sexual behavior, as implied herein; however, intervening factors, such as medical treatments and prophylactic devices, could alternatively account for reported differences in STD prevalence."

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