Herodotus on Diet and Longevity: How the Persians Fed on Dung and Lived to 80, While the Tall, Handsome Ethiopians Ate Boiled Meat and Lived Beyond 120

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Herodotus’ Histories tell of diet and longevity: the Persians, who ate bread from grain fertilized with dung lived but 80 years, while the tall handsome Ethiopians ate boiled meat and lived more than 120. These and other ancient texts anticipate current biomedical understanding of aging. However, there little evidence for supra-centenarians in the ancient world as noted in Herodotus, Genesis, and other classical texts: only recently have centenarians emerged as a significant age group. Nutrition and hygiene have been major factors in the increasing longevity and of adult height since 1800. It remains possible that some ancient elites achieved modern longevity.

KEYWORDS Herodotus’ Histories, Genesis, diet, hygiene, longevity

The title of this article draws from a passage in Herodotus’ great work, The Histories, from the 5th Century BCE, which may be the earliest statement about human dietary associations with longevity in the Greco-Roman literature. Herodotus, famous as “the father of history,” has received renewed attention with publication in 2007 of two major scholarly sources, The Landmark Herodotus (Herodotus, 2007a), with many informative footnotes, images, and maps, and A Commentary on Herodotus Books I-IV (Asheri et al., 2007), which gives rich line-by-line explanations. Every page contains delights for the surprisable mind.

“History,” or historie, meant inquiry and is among the key concepts Herodotus introduced. This book is remarkable as the earliest surviving

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complete ancient Greek text of an intended nonfictional nature. The Histories represent the Greeks’ political concerns about their bitter enemies the barbarian Persians, whose invasions they had recently beaten back (490–479 BCE) at Marathon, Thermopylae, et al. Herodotus sought to understand the locally perceived causes of the endless wars of those times. But he also had also great curiosity about the varieties of peoples and life styles. He was as pioneering in ethnography as in history by systematically searching for information on human diversity up to the exotic fringes of the known world from direct observation, interviews, and written sources (Redfield, 1985). Besides various peoples’ behavior, body shape, color, dress, health, and diet, their longevity was occasionally noted.

Curiously, no edition of Herodotus has referenced aging, life span, or longevity in the index. Besides diet, I find indications of the importance of hygiene to life span. The idea that external agencies determine life span was in Herodotus’ time a challenge to beliefs that individual fate is determined supernaturally, by the will or whim of a god, as indeed it remains to our time.

**HERODOTUS ON LONGEVITY AND DIET**

Herodotus tells us about a spy mission sent in the 6th Century B.C.E. up the Nile to the Aithiopes (Ethiopians) by the Greeks’ enemies, the Persians. About a life span before Herodotus, the Persians had invaded Egypt, establishing the XXVII “Persian” Dynasty (525–404 BCE).1 “Ethiopia” represented lands south of the First Cataract of the Nile (site of ancient Elephantine and modern Aswan (Herodotus, 2007, note 2.22; maps 2.18 and 2.140). The word Aithi-ops meant literally “Burnt-face” and referred to very dark-skinned people who dwelt on the fringe of the known world south of Egypt and beyond (Herodotus, 2003, note 2.20; Allen Lloyd, personal communication). These domains include northeastern parts of the modern Republic of the Sudan, but certainly did not include modern Ethiopia. Earlier in the 8th century BCE, some Aithiopes founded the XXVth dynasty of Egypt, known today as the Nubian dynasty, rather than the Ethiopian.

[The Aithiopes] . . . . asked what the Persian king ate and the longest life span of a Persian. They said he ate bread, related how the grain was grown, and set 80 years as the longest life span for a man. The Aithiopes replied it was no wonder they survived only for a few years if they subsisted on dung, and that they would not have been able to live [even] that long if they did not restore themselves with [wine]; as he made this remark, he pointed to the wine, for at least in this respect he admitted his own people were inferior to the Persians.
[The Persian spies] in turn asked the king about the life span and diet in his country. He told them that most of his people lived to the age of 120 years, and some even surpassed this age. Their food was boiled flesh, and their drink was milk. . . . [The Persians] were amazed at this life span . . .

This land [Ethiopia] produces much gold, enormous elephants. . . . and men who are the most tall, handsome, and long-lived. (Herodotus, 2007, Book 3, Sections 22, 23, 114)

I suggest that Herodotus' *Histories* is the earliest surviving Greek text to associate components of the diet with life span. Although other authorities on the history of gerontology have noted this passage (e.g., Grumann, 1966; Minois, 1989)², none to my knowledge considered the implications of the diet. Moreover, causality is implied by the remark “. . . they would not have been able to live [even] that long if they did not restore themselves with [wine]” (Book 3, Section 22). Herodotus frequently cites diet and drink in characterizing ethnic differences of health, but only here is diet and drink specifically linked to longevity. The Libyan nomads, which Herodotus called “the healthiest of all people,” also had a diet of meat and milk (4.186–7), but we are not told of their life span. Attention to (food and drink) dietetics in treatment of illness and for maintaining health is also a major theme of Hippocrates and his followers, who were known to Herodotus. Thus the *Histories* include many concepts from the emerging science of medicine (Lloyd, 2003; Thomas, 2000).

The Aithiopes’ remark about “eating dung” is understood by most translators as referring to the use of dung in fertilizing the soil (Herodotus, 2007, note 3.22.4a, p. 217). Manuring of the soil was already an ancient practice in Mediterranean agricultures (Alcock et al., 1994; Finch, in prep). Of course, “eating dung” was a highly insulting statement, as in Aristophanes’ *The Clouds*: “Since you imitate the rooster in everything, why don’t you eat dung and sleep on a perch?” (lines 1421–1431). This comedy, written during Herodotus’ time, parodied the new thinking by philosophers that some human behaviors are shared with animals. Thus, “eating dung” represents more than the Aithiopes’ opinion (a Greek proxy?) of the disgusting Persian invaders living downstream.

However, we must take the statements on life spans with the proverbial “grain of salt.” The Aithiopes were also called the *Makrobii* (long-lived), their tallness and remoteness adding to other semifabulous qualities (Halliday, 1924; Redfield, 1985; Romm, 2007). As discussed later, supracentenarian life spans are now recognized as extraordinary extremes, and not normative in any population. Notwithstanding the recentness of critical knowledge of paleodemography, even ancient readers must have winced at his fantastic comment that the Aithiopes’ semen was black like their skin (Herodotus 3.101).
But perhaps no less credible in those days was the importance of diet in life spans of mortal men versus the immortal gods. Every Greek knew that the immortal gods of the Homeric epics would not touch the grain and meat, milk and wine that define the diet of mortal men. The immortals were nourished solely by nectar and ambrosia which enabled their eternal youth (Clay, 1981). It is intriguing, and not commented on by other scholars of the history of gerontology, that the word nectar has the roots nect/ar, or “death-surpassing” (Levin, 1971). Everyone understood that the individual life span was predestined by fate (moira, meaning portion) and not under human control. According to the common Greek myth, the goddesses of fate, the Moirea, prevailed over each person’s life span: Klotho spun the thread of life, Lachesis fixed its length for each at birth, and inevitably, Atropos cut the thread. However, the effect on longevity of wine and bread versus milk and meat is almost speculative now as 2500 years ago.

How credible was Herodotus about longevity? A 120 year life span was also mentioned for King Arganthonius (Herodotus 1.163). The 120 year life span recurs in so many other ancient text that it may be considered a fundamental unit of number symbology in gero-mythology. The words Herodotus used to designate the 80 and 120 year life spans, while representing “real numbers” for 80 and 120 (personal communication from Andrea Purvis, translator of Herodotus, 2007, the Strassler edition), were also used loosely. Numbers given to human ages in ancient Greek times had less specificity than in modern societies, where the exact age routinely determines pensions and other assets, and may force retirement. The year of birth was becoming important in Herodotus’ time in many Greek cities (Minois, 1989, p. 68), but did not include the day within the year. Still, some numbers were already precisely understood in Herodotus’ world: In contrast to the evident age-elasticity, weights and measures were more strictly held in the domains of commerce and taxation (Martin, 2007).

**LONGEVITY IN GENESIS AND THE PLINY’S**

The 120-year life spans in Herodotus also recur in the Torah, or Old Testament. “. . . [For he] man is but flesh. Let his days be 120 years” (Genesis 6:3). But we must also reckon with the fabulous longevities of the patriarchs: Adam, 930 years; Noah, 950; Methuselah, 969 years. After Moses died at 120 (Deuteronomy 34:7), only Jehoiada and Job lived longer (noted to me by Solomon Golomb). These numbers have been recalibrated by Rosenzweig (1980), who argued from linguistic and cultural elements that the word “year” meant half-year or even the length of a season. However, the great range of life spans in Genesis precludes any consistent recalculation. For example, in the lineage of Noah’s son Shem, the life span in successive generations decreased progressively to approach modern longevity records.
after Abraham (Genesis 11:1–20; Alter, 2004, footnote, p. 60). Some biblical scholars consider Genesis as largely mythical, noting other anomalies and anachronisms from the Patriarchal period and the lack of correspondence to other historic texts and archeological evidence (e.g., Alter, 2004, p. 119). These sections of the Books of Moses were assembled or written after 950 BCE, possibly up to the 5th Century BCE, the time of Herodotus. There is no evidence that the ancient Hebrew texts translated into Greek after the 3rd Century BCE (the Septuagent) were known to their Greek contemporaries of the earlier era. However, there is much evidence for Western Asian influences on Greek mythology and thought, including numerous Semitic sources (West, 1997). Notably, the Greek alphabet was derived from the Phoenecian writing system, as was the Hebrew.

Quite possibly, some ancients enjoyed exceptional life spans in favorable environments. Sophocles (495–406 BCE), reputedly a friend of Herodotus, was said to have written his last play Oedipus at age 90. Five centuries later in the Roman world, Pliny the Elder followed the Herodotean model in his assembled accounts of Ethiopians and others living to 400 years in Natural History, published about 77 CE (Book 7: 2, 49, 50). A generation or so later, we find Lucian’s book on the longevity of exotic peoples, Macrobius, which cites extreme 300-year life spans among the Seres of northwest China as possibly attributable to their exclusive use of water as their beverage. Lucian, who is better known for his novels, may have been the latest pagan to have continued the Herodotean collection of tales of great longevity.

We may also learn further about the environment and life span from Pliny the Younger from his Letter to Domitius Appolinaris, circa 104 CE. After describing the healthy atmosphere of his summer mountain estate away from teeming Rome, he declares:

Hence the number of elderly people living there—you can see the grandfathers and great-grandfathers of people who have reached their own manhood, and hear stories and tales of the past. . . . . (p. 139)

Assuming short generation times of 20–25 years, the great-grandfathers of young men could be over 80. Also cogent is the observation:

My servants too are healthier here than anywhere else; up to the present I have not lost a single one of those that I brought here with me . . . (p. 144)

Premature deaths of servants in his privileged household would have been most likely due to infections, which have been a major cause of mortality throughout human history (Crimmins & Finch, 2006; Finch, 2007; Finch & Crimmins, 2004; Scheidell, 2009). The coastal plains had become infested by malaria by that time (Aldarette, 2007, p. 148; Sallares, 2002; Scobie, 1986). Thus, in extolling the healthy atmosphere of his summer home, the younger
Pliny was observing the benefits of a less contagious environment that may have reduced mortality across the life span.

Sober demographic work has not proven exceptional longevity in the ancient Mediterranean world. The evidence from official records, skeletal remains, and tombstones is haphazard in the fragments that have survived (this large literature is critically discussed in Minois, 1989; Parkin, 1992, 2003; Harlow & Laurence, 2007; Gowland, 2007; Scheidell, 2001). Bessie Richardson’s pioneering analysis of ancient Greek tombstone epitaphs concluded that the average life span was about 30 years (1933). As an example of the difficulties, consider the divergence of life spans calculated from tombstones in Rome: for inscriptions in Latin, the life expectancy at birth was below 23 years, but was 51 for those in Greek (Ery, 1969). This difference is better attributed to funerary practices than to differential mortality in the same city (Parkin, 1992; Gowland, 2007). It must also be noted that the majority of the populace could not afford memorialized burials. Moreover, while dental and long-bone growth patterns from burial samples can resolve several age classes younger than 20, advanced adult ages have not yet been accurately reckoned on the basis of osteoarthritis, osteopenia, or tooth wear (Hoppa & Vaupel, 2002; Gowland, 2007).

I suggest that the demographic reconstructions of various Greco-Roman populations (vide infra) approximate those of pre-industrial Europe (Oeppen & Vaupel, 2002) and well-documented 20th-century populations of hunter-foragers (Gurven & Kaplan, 2007; Finch 2007). The shared demographic profile is a life expectancy at birth of 30–45 years, weighted by high mortality at early ages (20–50%), but still giving substantial life expectancy of those surviving into adulthood. For example, survivors to age 15 had modal ages (most frequent age class) at death of about 72 years (range 68–78), in 1751 Sweden and in various 20th century hunter-foragers (Gurven & Kaplan, 2007). The modal age at death in Greek notables who reached at least 30 is also about 70, which would have allowed 10–20% of the adult population to be 60 or older (Finch, in prep.). Thus, we may be reasonably confident that the Greco-Roman populations included a substantial proportion surviving to ages we would recognize as elderly.

**MODERN DEMOGRAPHICS OF SUPRACENTENARIANS**

The extreme ages of 120 and beyond in Herodotus, Pliny, and Lucian are unsupported by critical demographic studies and by careful analysis of various reports of “supracentenarians” in remote regions. A few decades ago, Alexander Leaf, a distinguished Professor of Medicine at Harvard, thrilled the public with his National Geographic expedition, which reported
numerous supracentenarians in remote mountain villages of South America and Western Asia (Leaf and Launois, 1973, 1975). These vivid narratives and photographs described vigorous elderly in Vilcabamba (Ecuador), Abkhasia (Georgia, USSR), and Hunza (Pakistan). The oldest Abkhasian, Shirali Mislimov, was reputedly 167. In these “bastions of longevity,” the self-claimed centenarians comprised 1.1% of the population in Vilcabamba, an estimate Leaf advanced to his readers tentatively but straight facedly. Obesity was rare, and the diet in these three locations was spare by Western standards, less than 2000 calories/day with little animal fat. Whatever their health, their given ages did not hold up. Return visits revealed the elasticity of age from one interview to the next (Mazess & Forman, 1979) and an equally embarrassing failure to find the purported records of birth, all of which was gradually conceded (Leaf & Launois 1975; Leaf 1982, 1990). Birth certificates of supracentenarians shown by another traveler to the Andes (Davies, 1975) proved to be death certificates (Doris Finch, Finch, 1976).

Critical work by modern demographers, has validated some modern extreme life spans, but clearly shows the extreme rarity of centenarians before 1800 (Jeaune & Vaupel, 1999; Kanisto, 1988; Robine & Paccaud, 2005). The 122 year life span of Jean Calment (1875–1997) remains the proven record (Robine & Allard, 1998; Jeune et al., 2009). The closest to gero-nirvana may be the “longevity belt” of Okinawa and a few southwest Japan prefectures, wherein about 0.05% of the total population is considered centenarian (Willcox et al., 2008). The age-dating, however, is debatable, because most of the original records were destroyed by the fires of World War II, and have been reconstructed by family survivors. In most other populations, the prevalence of centenarians is 0.01 to 0.02%. Thus, the received historical information that about 1–5% of named ancients survived to 100 is a hundred-fold excess over the modern prevalence of centenarians who have benefited from modern hygiene and medicine (Finch, in prep.).

The myth of extraordinary longevity in remote regions persists today, as in Herodotus time, despite widely publicized refutation, for example, in the New York Times (Sullivan, 1978) and in the lucidly written trade books of Steve Austad (1999) and Tom Kirkwood (1999). However, even so careful a classical scholar as Robert Alter was unaware of these revisions in concluding that the Patriarchal life spans dwindled “...to the extraordinary life spans of the modern Caucasian mountain dwellers and not legendary life spans.” (Alter, 2004, p. 60). Moreover, many prolongevityists continue to repeat myths of exceptional longevity with the same passion as biblical literalists. Lacking any reason to think that human biology of aging of today differs from that of the ancient Greco-Roman world, most biogerontologists and biodemographers dismiss the claimed ancient life spans greater than 100 as nonsense. So caveat lector!
TALLNESS AND LONGEVITY: CLUES TO DIET AND HYGIENE

But Herodotus’ Aithiopes may still have more to tell us. Associations of handsomeness, tall stature, and longevity could be consistent with adequate nutrition and low incidence of infectious disease. Since 1800 in Europe, adult height and longevity have increased in proportion to the reduction of early age mortality (Crimmins & Finch, 2006; Finch & Crimmins, 2004; Finch, 2007). The recent improvements in both hygiene and diet have decreased early age deaths which are largely due to infections. Because childhood infections are strongly linked to growth stunting, the “tallness” of the Aithiopes suggests that they incurred fewer chronic infections during childhood. The link of reduced infections to longevity is hypothesized to involve a smaller burden of chronic inflammation, which putatively shortens life span by accelerating aging of the arterial and immune systems, and by increasing cancer risk (Crimmins & Finch, 2006; Finch, 2007; Franceschi et al., 2007). Their “handsomeness” further suggests the absence of pox marks or other disfigurement from infections.

The role of hygiene in the recent increases of longevity returns us to the Aithiopes’ slur on Persians eating dung, which referred to how the grain was fertilized (Herodotus, 3.22 and footnote 3.22.4A, Herodotus, 2007). They may have been revolted by the use of human feces as fertilizer, but we can’t tell from the word *kopros* used by Herodotus, which does not distinguish between human and animal (personal communication from Andrea Purvis). In ancient Greece, crops were commonly fertilized by dung, which could be from domestic animals or from the collected night-soil (Alcock et al., 1994). Thus, “eating dung” seems to represent the Aithiopes’ disgust about the impure practices of those unfortunate Persians living downstream.

CONCLUSIONS

Herodotus was the first in the Greco-Roman literature to associate specific diets with long life spans. The Ethiopians’ association of grain with the short Persian life spans seems an echo from Homer’s epic, where senescing humans eat grain and drink wine, while the ageless gods subsist forever on ambrosia and nectar. However, accounts of great longevity in the Ethiopians in Herodotus and in other ancient sources are cherished fables, but very unlikely. Nonetheless, it remains plausible some that some ancients reached the 90s. There is a basis for further study of fragments of “gerontology and geriatrics” in Herodotus and other pre-Socratics to the rational or scientific medicine which was emerging at the end of Herodotus’ life in the Hippocratic writers (Finch, in prep.).
NOTES

1. Cambyses II, son of Cyrus the Great, had sent the spy mission, possibly to Meroe, “metropolis of the Ethiopians” (Herodotus 2.29) and capital of the Kushite (Nubian) kingdom, 6th to 2nd century BCE, which was 52 days hard traveling upstream of the First Cataract. Scholars concur that Herodotus went as far upstream as the temples at Thebes (Herodotus 2.143), but there is no evidence that he went beyond the First Cataract into “Ethiopia.” Furthermore, Burstein (1981) argues from archeological and historical evidence that this mission was a fantasy. Although not mentioned by Herodotus, even more distant southerly lands had been visited a millenium before by the great Egyptian queen Hatshepsut, whose trading fleet sent from the Red Sea in 1493 BCE went beyond the Horn as far as the Land of Punt (Somalia).

2. Gerald Gruman’s major survey of prolongevity in the ancient world noted the Persian surprise at the Ethiopian 120 year life span, but focused on a later part of the text not discussed here, which describes a wondrous spring (Gruman, 1966, p. 25). Two decades later, Georges Minois’ more detailed monograph also discussed other aspects: “This astonishing passage reveals the preoccupation of men of antiquity with old age. The question of the superiority of one people over another is here set not on the level of wealth or military power, but on that of human longevity” (Minois, 1987, p. 18).

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