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Paleolithic Fallacies

Imagine picking through wild bushes, gathering berries, and hunting wild game for food…in present day New York City. Why are you doing this instead of going to McDonald’s? According to supporters of the Paleolithic diet (as called the Paleo-diet or the Caveman diet), you are doing this because our ancient, 2.6-million-year-old ancestors did it. And our ancestors were a healthier version of modern day humans, a version we can revert to by mimicking the Paleolithic era diet.

 While Paleolithic diet supporters do not suggest actually hunting and gathering your meals, they do promote a hunter-gatherer diet as a means to better health. In this essay I will present the claims made by Dr. Loren Cordain and other Paleolithic diet enthusiasts, analyze the claims and relevant data, and discuss the importance and validity of the enthymeme that a Paleolithic lifestyle is beneficial to modern humans. I will also explore why diets such as this gain wild popularity and blind followings.

 My goal is not to prove the successfulness of the diet on an individual level or to criticize people who have benefited from this lifestyle. Instead, I aim to deconstruct the argument that following a Paleolithic diet is best *because* it is how we ate in the distant past. I will prove that while the Paleolithic Diet may provide health benefits to some people, the origins of the diet are rooted in marketing, pseudoscience, and questionable inferences.

**A Brief History**

 While a Paleolithic lifestyle has been suggested from at least the 1970’s (Zuk, 2013, p. 49), more recently Dr. Loren Cordain has promoted the trend. Currently a Health and Exercise Science professor at Colorado State University, Dr. Cordain offers an alternative to our unhealthy modern lifestyle through the Paleolithic diet. The diet claims many health benefits on the basis that our early ancestors were the epitome of human health due to their eating habits and therefore we should constrict ourselves to their diets. The diet focuses specifically on the Paleolithic era, from about 2.6 million years ago to about 10,000 years ago with the development of agriculture (“About the Paleo Diet,” n.d.). In addition to Dr. Cordain, many other magazines, books, and websites encourage a Paleolithic lifestyle for better health.

 So, are these claims true? First we need to consider whether the claims can even be *proven* true. Here is where things get a little messy. The Paleolithic diet seems to be both pseudoscience and a controversy within science. As with other pseudoscientific claims, the diet is not conclusively testable or falsifiable because it is based on a causality that is impossible to determine. On the other hand, some portions of the claims can be proven, yet scientists debate the interpretation of facts.

**Dissecting the Diet**

 Accepting the Paleolithic lifestyle as a logical and scientific path to an optimal quality of life requires believing underlying “truths”. To analyze these “truths”, I have organized the most prominent claims and conclusions (based on popular media like Dr. Cordain’s website and *Paleo Magazine*) into a two-part syllogism. The first syllogism includes two premises: A) we know what our ancestors ate; and B) we were healthier in the past. The diet then requires that we make the conclusion that what distant ancestors ate contributed positively to their health. If this syllogism is accepted, we can move on to part two. Premise A for Syllogism 2 is the conclusion from Syllogism 1: The diet of our ancient ancestors contributed positively to their superior health. Premise B states that modern humans have not adapted or evolved enough to benefit from modern food, especially food resulting from the agriculture revolution. Premise A and Premise B from Syllogism 2 contribute to the overall Paleolithic diet claim: Eating like we did in the past is a healthier alternative to modern eating habits because it produced healthier humans in the past and we have not evolved sufficiently since then. Unfortunately, this is a syllogistic fallacy that Paleolithic diet fans do not consider worth dissecting. To really tackle the Paleolithic diet we must first analyze each premise, and then consider whether the conclusion is a *non sequitur*. (For a visual breakdown of these syllogisms, see Table 1 and Table 2).

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| Table 1*Syllogism 1 for a Paleolithic Diet* |
| Premise A | We know what our ancient ancestors ate. |
| Premise B | Paleolithic ancestors were healthier than modern humans. |
| Conclusion | Ancient ancestral dietary habits contributed positively to their overall health. |

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| Table 2*Syllogism 2 for a Paleolithic Diet* |
| Premise A | Ancient ancestral dietary habits contributed positively to their overall health. |
| Premise B | Modern humans have not adapted or evolved enough to benefit from agricultural foods. |
| Conclusion  | Following a Paleolithic diet like our healthier ancestors did will increase our health and decrease presence of diseases that were not present during Paleolithic times because we have since not evolved enough to adapt to modern food habits. |

 Let us consider the above “truths” surrounding the Paleo diet and figure out what exactly the Paleo-enthusiasts propose. As mentioned before, my goal is not to report successful or unsuccessful health changes in individuals, in fact the main Paleo diet website itself admits that “There are no guarantees that every person using this program will lose weight or gain fitness. Weight loss and fitness depend on many factors and the results may vary from person to person” (“About the Paleo Diet,” n.d.). Instead, I aim to discover if the reasoning behind the claimed success is logical.

**Syllogism 1: Premise A**

 The first line of acceptance requires believing we know our ancestors’ lifestyles, specifically what they ate. Since our Paleolithic ancestors did not keep dietary journals, Tweet about their breakfast, or post pictures on Facebook of their meals, we do not have as detailed a record as we do for modern humans. In fact, during the Paleolithic diet time frame, archaeological sites are rare and usually not completely intact (Richards, 2002). Thus, we do not have the mass amount of archaeological material (bones, teeth, etc.) necessary to generalize about people from all over the world within a 3 million year time span. Since the Paleolithic diet does not specify where or when our disease-free ancestors existed, except to say they lived from 2.6 million years ago until the agricultural revolution, it is hard to generate enough conclusive evidence to prove that the extremely general diet during that time frame led to better health. We do, however, have some artifacts, most of which are animal bones and tools. Because most of what we find in the limited archaeological sites points to animal consumption, the Paleolithic diet tells us to “eat generous amounts of animal protein. This includes red meat, poultry, pork, eggs, organs (liver, kidney, heart…), wild caught fish and shellfish” (“Paleo 101,” n.d.). But, as Marion Nestle point out, “since bones are better preserved than vegetable matter, they give the impression that hunted animals must have been primary food sources” (as cited in Richards, 2002). So even though we do have *some* evidence of what our ancestors ate, it is clear that we do not have *all* the evidence. Paleo-enthusiasts see this lack of evidence (e.g., lack of sufficient vegetative remains) as positive evidence that meat was favored. However, the absence of evidence is not the evidence of absence. In other words, absence of non-meat remains in Paleolithic sites is not evidence that those foods were absent or less favored. Unfortunately, people respond more to positive proof than absence of proof so, with this appeal to ignorance, Paleolithic diet promoters are free to speculate without fear that others will present unfavorable concrete evidence against them.

**Syllogism 1: Premise B**

 Followers of the Paleolithic diet ascertain that our early ancestors were “typically” free from modern illnesses, including: acne, obesity, cardiovascular disease, cancer, autoimmune disease, osteoporosis, myopia, varicose veins, and gout (“Getting Started with the Paleo Diet,” n.d.). Besides the blatant “typically”, there is little evidence that our million-year-old ancestors were in fact free from many diseases. In a study by Professor Randall C Thompson MD and others, probable or definite atherosclerosis was found in 47 of 137 mummies excavated in four geographically distinct areas (Thompson et al., 2013, p. 1). Although these mummies date back only about 5,000 years, the study presents some significant data. Most importantly, one of the sites was that of Unangan pre-agricultural hunter-gatherers in the Aleutian Islands. In this demographic 60% of the mummies suffered from atherosclerosis, the highest percentage of all the four regions (Thompson et al., 2013, p. 1). So why did these hunter-gatherers suffer from a heart disease when they were following the same diet as our ancient hunter-gatherer ancestors? And why did other mummies of Egyptian, Peruvian, and Ancestral Puebloan descent show the same disease? I suspect that Paleo-enthusiasts would argue that 5,000 years is not ancient enough, or that the Unangan hunter-gatherers do not represent our Paleolithic hunter-gather ancestors. But isn’t it more likely that diseases like atherosclerosis are an innate peril of human aging? Thompson et al. proved that atherosclerosis is not just a current problem, or one localized to a specific region with specific health practices. Using Occam’s Razor, it is more logical to conclude that atherosclerosis, and most probably other cardiovascular diseases, are prevalent regardless of location and diet, and more likely dependent on other factors such as age or heredity.

 Besides the previous example, there are many other explanations for why one might assume our Paleolithic ancestors were disease-free. For one, most diseases present themselves later in life; much later than the average life span of humans thousands and millions of year ago. Many proponents for a pre-agriculture society use claims like the following to “prove” that post-agricultural societies are worse off: “members of technologically primitive cultures who survive to the age of 60 years or more remain relatively free from these disorders, unlike their ‘civilized’ counter-parts” (Eaton & Konner, 1985, p. 283). While this may be statistically true, we need to remember that people in technologically primitive cultures that *do* have these diseases may not be likely to live past 60, therefore the 60+ sampling group is a collection of people healthy enough to live to that age, likely because they are free from disorders in general. Compare that to “civilized counter-parts” where more 60+ people have these diseases because they are, due to modern medicine, able to actually live to 60 or older with the disorder. Additionally, it is possible that our ancient ancestors suffered from many more diseases that we do not recognize today, either because we have now become immune, or because everyone who had it died. So even if our Paleolithic ancestors were “typically free from modern diseases”, which may not be true, they may still have suffered from pre-modern diseases or simply not lived long enough for modern diseases to manifest. As with other aspects of the Paleolithic diet, the “proof” that our ancestors were healthier is merely a case of observational selection at best.

**Syllogism 1: Conclusion**

At this point, if we still accept that we can determine ancestral diets, and that humans were healthier in the past, despite evidence to the contrary, we still have to infer one premise is related to the other. In other words, we have to believe that if we follow the first, we can achieve the second. But, does a specific eating habit directly correlate to our overall health? More importantly, did the specific eating habits of our ancestors directly correlate to the diseases they were supposedly free from? As we saw in the previous sections, it is difficult to determine a general diet and standard of health for Paleolithic people. This makes it even more difficult to suggest that ancient dietary habits were directly related to positive health. In dietitian Lois D. McBean and Dr. Elwood W. Speckmann’s article about diet fads, they write “Nutritionists and dieticians are aware that no single food pattern must be adhered to for the purpose of ensuring good nutrition. Man requires specific nutrients, not specific food items” (McBean & Speckmann, 1974, p. 1072). So even if we could prove what Paleolithic hunter-gatherers ate, *and* definitively know their positive health status, the conclusion could still result from a confusion of correlation and causation.

**Syllogism 2: Premise A**

 As demonstrated in Table 1, the first premise for the second syllogism is the conclusion from the first syllogism: ancient ancestral dietary habits contributed positively to Paleolithic people’s overall health. Let us consider, despite its fallacies, that the conclusion to syllogism 1 is logical. From there, we can move on to the second premise and the overall diet’s conclusion.

**Syllogism 2: Premise B**

 Premise B is essentially the backbone of the Paleolithic Diet: modern humans have not evolved sufficiently since the Paleolithic era, which is why followers can argue that what worked for ancient ancestors will work for us. Likewise, diet promoters claim modern humans have not successfully adapted to what foods are currently widely consumed. Dr. S. Boyd Eaton and Dr. Melvin Konner reflect on the time period between 2 million years ago and 4 million years ago and state “evolutionary history made definitive contributions to our current genetic composition, partly in response to dietary influences at the time” (Eaton & Konner, 1985, p. 284). They then go on to say, “the range of diets available to preagricultural human beings determines the range that still exists for men and women living in the 20th century” (Eaton & Konner, 1985, p. 283). Dr. Eaton and Dr. Konner suggest that the period between 4 million years ago and 2 million years ago drastically shaped, or even “programmed”, our optimal diet. But just because certain foods were readily available during that time does not automatically suggest that our bodies were programmed to eat only those foods. Like most animals, our early ancestors followed an optimal forging model to obtain the most calories with the least amount of energy. Without modern technologies, this meant collecting easy-to-gather materials and hunting easy-to-hunt animals. Thus, food availability during that time period was not necessarily the result of preprogramming, but a manifestation of food source limitations.

 Further, the time frame suggested by Eaton, Konner, and other Paleo-enthusiasts seems arbitrary. Why base a diet on a time starting 2 million years ago (except, of course, for the fact that it was the “Paleolithic” era)? Why not start 25 million years ago? And why end with the agricultural revolution? After all, humans have since then developed the ability to consume lactose at older ages in life. At the same time, millions of people are allergic to fish, nuts, and peanuts, food we have been consuming for thousands and thousands of years (“Common Food Allergies in Infants, Children, and Adults,” n.d.). These facts suggest that we can not only adapt to certain foods in a relatively short time frame, but individual people (and individuals in specific geographical regions) can benefit from the same foods that harm others. Thus, a “preprogrammed” model for human dietary needs is not appropriate. Biological anthropologist Barbara King sums it up perfectly: “genes no more ‘designed’ our eating behavior than they designed our language or our ways of relating between genders.” (King, 2011).

**Syllogism 2: Conclusion**

 Now we come to the final conclusion: following a Paleolithic diet like our ancestors did will increase our health and decrease presence of certain diseases because the diet mimics what we know our ancestors ate and those eating habits contributed directly to their superior health and freedom from now-common diseases. Once broken down, we can see that to accept this overall conclusion, one must accept the interwoven assumptions that this claim carries with it. The underlying claims, once uncovered, are easily analyzed and dissected. This method of deconstruction is a helpful way to grasp exactly what the Paleolithic diet enthymeme is claiming and how Paleo-enthusiasts justify each claim.

**Discussion**

 We considered earlier whether the Paleolithic diet claims are pseudoscientific or merely up for scientific debate. After analyzing the various underpinnings, we can see that some parts of the claim are based on scientific data and thus falsifiable. For example, we have some evidence of what our ancestors ate and what their health might have been like, even though the significance is debatable. However, the Paleolithic diet becomes pseudoscience when it links all the little “facts” into a chain held together by *non sequiturs*. The real scientific processes behind the diet may be accurately executed but they are masked by misinterpretations and faulty correlations. The presence of scientific data and pseudoscience makes this type of claim especially harmful because the promoters can point to accurate scientific evidence to support their view. For example, the Paleolithic diet presents evidence that people who follow the diet become healthier. But, control experiments do not prove the claim; they can prove that monitoring your food intake or excluding specific foods from your diet leads to a healthier life, but studies cannot and do not prove that “the path to optimal health is through eating only what our ancestors ate before modern agriculture and a shift to more sedentary ways” (Zuk, 2013, p. 49).

**Why the hype?**

 If this diet has so many obvious and other not-so-obvious fallacies, why promote it?

Why not advocate a healthy overall diet instead of weaving a porous web based on unreliable conclusions? Unfortunately, promoting a general healthy diet does not sell. What sells are labels. Diets like the Atkins Diet, the South Beach Diet, the Mediterranean Diet, and many others succeed by providing different, easier, “better” weight-loss methods. I am not proposing that all promoters of fad diets are money-hungry charlatans. Most, I would hope, truly believe in the diet and want to help people live healthier lives. Still, many diet followers choose not to question the scientific basis of dietary claims. This may be because our society is obsessed with prolonging life and living “naturally”, yet we expect to find quick fixes to achieve this lifestyle. Fad diets provide this quick fix and further, “the media debate is seldom helpful in separating beliefs and hypotheses from science-based conclusions regarding connections between food and body weight, or health in general” (Bryngelsson & Asp, 2005, p. 19).

 Blindly following fad diets can be harmful because the diets often act as a self-diagnostic tool for what might be real, harmful conditions (McBean & Speckmann, 1974, p. 1072). Additionally, fad diets do not encourage skepticism, which is an essential tool for understanding our world and progressing as a society.

**Conclusion**

 As mentioned earlier, my goal is not to discourage the Paleolithic diet per se, because many people have benefited from it, but to encourage people to question the science behind fads such as this. In the case of the Paleolithic diet, a series of embedded syllogistic fallacies give rise to the enthymeme that we can achieve optimal health by following the diets of our earlier, healthier ancestors. As we can see from the previous analysis, many of the Paleolithic diet claims are based on poor induction strategies, logistical fallacies, and unsupported, non-scientific evidence.

 Promoting diets that are not based on logical reasoning contribute to the overall scientific illiteracy of our society and demean the real scientific efforts of qualified scientists. However, with proper understanding of scientific processes and the application of skepticism, we can successfully debunk money-driven diet fads and other pseudoscientific claims.

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