experiences of populations, they seem almost irrelevant because they will be very largely ignored.

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Reply to ARP Walker

Dear Sir:

We appreciated and enjoyed Walker’s constructive comments and interesting insights and agree with many, but not all, of his conclusions. Numerous epidemiologic data support the notion that increasing Westernization and industrialization in human populations is associated with a greater incidence of chronic degenerative diseases. It is almost axiomatic that changes in diet and activity levels initiated by Westernization and industrialization are largely responsible for these health disorders. As human societies stray farther and farther from the original environmental conditions (both diet and exercise) for which our present genome was selected, it is not unexpected that ill-health effects should emerge (1, 2).

We have little doubt that some, but not all, lifestyle characteristics of rural Africans and many of the world’s other less industrialized people could serve as a model to benefit the health and well-being of Western populations. However, the reason certain of these lifestyle variables are advantageous is that they are consistent with those of Stone Age hunter-gatherers that in turn represent the lifestyle characteristics for which our species is genetically adapted. High levels of physical activity are required of both hunter-gatherers (2) and rural Gambian subsistence farmers (3) and similarly may provide both of these groups with protection from degenerative disorders and disease. However, the proximate mechanisms of exercise’s therapeutic effect are not specifically intrinsic to subsistence farming but, rather, stem ultimately from the rigors and selective pressures dictated by the physical requirements of the hunter-gatherer lifestyle that shaped the present human genome over >2 million years of evolutionary experience. Similarly, it was found that increased dietary intakes of n−3 fatty acids may provide protection from chronic disease in highly industrialized societies such as Japan (4) and in partially Westernized hunter-gatherers such as the Inuit (5). The ultimate evolutionary reason these fatty acids afford protection for these diverse populations is based on our species’ genetically determined requirement for them, which in turn was shaped by the environmental selective pressures that fashioned the present human genome. By examining the original environmental conditions for which our present genome was selected during the Paleolithic Era (the Old Stone Age, lasting from 2.6 million y ago until the agricultural revolution 10000 y ago), it is possible to gain insight into optimal lifestyle characteristics that may be of therapeutic value for modern populations experiencing degenerative disorders.

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Reply to ARP Walker

Dear Sir:

It is gratifying to see that Walker’s letter supports my recent Editorial (1), which pointed out that hunter-gatherer societies are largely free of chronic degenerative diseases despite notable differences in plant-animal subsistence ratios and macronutrient energy patterns. Walker, whose expertise on this topic is widely recognized, expands on this point, discussing the relative freedom from degenerative disease that is characteristic of all pastoral societies in Africa (who consume low-fat diets) and of other rural African populations.

In keeping with his letter’s title, Walker then suggests that, rather than seek health and ill-health lessons from hunter-gatherers, it might be more relevant to study present-day Western populations that vary in their incidence of degenerative disease. I assume that he suggests this because, in the near future, most or all human populations worldwide will probably be Westernized. Thus, regardless of how healthful the hunter-gatherer lifestyle and diet may be, no one will live under such conditions. But, as Walker suggests, if we could determine why some Western populations show less evidence of certain degenerative diseases than do others, we could emulate the more healthful patterns. Walker concludes his letter somewhat pessimistically, noting that, even if such recommendations were forthcoming, current evidence suggests that they would largely be ignored.

The comparative studies that Walker advocates are of considerable value and importance. However, because human biology appears to have altered little over the course of human evolution (most human adaptations having been cultural rather than biological), it seems that casting a wide net would produce a more complete picture. We need to bear in mind that the contemporary Western lifestyle is only an experiment in progress. In contrast, the hunter-gatherer way of life has been time-tested and proven for >2 million y.

True, we can only speculate about dietary proportions of ancestral hunter-gatherers. But other relevant dietary information can be determined from the fossil record, and our ability to recover such information is constantly improving (2). Archaeological and skeletal remains permit us to trace the changes in human health that accompanied the dietary transition to agriculture and estimate the length of time a population may have used a given plant or animal staple (3). Detailed information about nutrient characteristics of wild foods shows important ways in which hunter-gatherer diets differ from contemporary Western diets (4–6)—and here I am referring not to processed modern foods but to differences in the nutrient content of fresh cultivated compared with wild plant foods and domesticated compared with wild animal foods. Study of hunter-gatherer behavior shows that most hunter-gatherers have a very active, physically demanding lifestyle. In addition, our investigation does not have to be restricted to humans. For example, examination of the natural diets of wild apes and monkeys shows interesting differences between the nutrient patterns of their diets and those of contemporary Westerners (6).

Walker is justly concerned because many people appear to ignore diet-related suggestions that could improve their health and longevity. Research with hunter-gatherers may provide clues as to why people behave in this manner. Although considerable material has been published on the dietary behaviors of some hunter-gatherer societies, quantitative data are generally scant and there is a strong need for more detailed study of this topic while time permits.

It seems that many hunter-gatherer diets consist largely of the same foods each day. Most wild foods are low in energy, and it often requires tremendous effort to secure a sufficient supply. For example, indigenous Amazonians, both men and woman, typically devote ≥8 h/d to subsistence activities (7). Rare, energy-rich wild foods seem particularly critical for children and women because of the costs of growth and reproduction, respectively. Fat reserves are also necessary to survive seasonal low points in overall food availability (8, 9).

In contemporary Western nations, it makes perfect sense that a well-nourished person who has already consumed sufficient energy for a 24-h period does not need to eat a piece of cake. Why do most of us reach for that cake more or less automatically? Perhaps it is because we are “programmed” through our common evolutionary heritage as hunter-gatherers to be particularly responsive to foods that appear rich in energy (8, 9).

For similar reasons, we can predict that people might show resistance to changing the features of their customary diet, even when such changes would prove beneficial. Smith and Smith (10) compared 3 diets of northwestern Australian Aborigines over the period 1890–1970: their diet as hunter-gatherers, their diet when they lived on cattle stations where some Western staples were available, and their diet in contemporary Aboriginal communities in which Western foods could be self-selected.

Comparison of the 3 diets with a modern recommended diet supported the nutritional adequacy of the hunter-gatherer diet (wild cereal and fresh plus dried fruit with a moderate amount of meat). However, there was a common link among the 3 diets in that they all represented a relatively unchanging Aboriginal evaluation of the worth of several major kinds of food despite the radically changing availability of these foods. Such traditional evaluations in the context of Western rather than wild foods resulted, for example, in a dramatic increase in the proportion of dietary energy from fat and lower intakes of some vitamins (10). Dietary changes were accompanied by altered patterns of disease, including well-documented increases in hypertension, diabetes, and heart disease (10). Similar observations were made of the Maori—“in spite of increasing use of Westernized foods the Maori will favor fatty foods and traditional seafoods if available” (11).

Such examples suggest that certain contemporary behaviors of humans with respect to foods may relate, at least in part, to nonimmediate dietary circumstances. Obesity and its associated health problems and some other current diet-associated conditions (eg, lactose intolerance and celiac disease) seem inextricably bound up in past interactions between humans and their foods. Comparative study of only contemporary Western populations would not provide the temporal depth needed to understand the full etiology of these conditions. Also, for humans, food often is not consumed for its nutritional content but for its relation to the social context and cultural meanings that different...