Chronic Complex Disease as a Growing Mismatch Between our DNA and Our Modern Environments

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- Health as a byproduct of DNA-environment compatibility

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REVIEW Open Access

Natural environments, ancestral diets, and microbial ecology: is there a modern "paleo-deficit disorder"? Part I

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Abstract

Famed microbiologist René J. Dubos (1901–1982) was an early pioneer in the developmental origins of health and disease (DOHaD) construct. In the 1960s, he conducted groundbreaking experimental research concerning the ways in which early-life experience with nutrition, microbiota, stress, and other environmental variables could influence later-life health outcomes. He also wrote extensively on potential health consequences of a progressive loss of contact with natural environments (now referred to as green or blue space), arguing that Paleolithic experiences have created needs, particularly in the mental realm, that might not be met in the context of rapid global urbanization. He posited that humans would certainly adapt to modern urban landscapes and high technology, but there might be a toll to be paid in the form of higher psychological distress (symptoms of anxiety and depression) and diminished quality of life. In particular, there might be an erosion of humanness, exemplified by declines in altruism/empathy. Here in the first of a two-part review, we examine contemporary research related to natural environments and question to what extent Dubos might have been correct in some of his 50-year-old assertions.

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"Human beings can almost certainly survive and multiply in the polluted cage of technological civilization, but we may sacrifice much of our humanness in adapting to such conditions... The maintenance of biological and mental health requires that technological societies provide in some form the biological freedom enjoyed by our Paleolithic ancestors".

Dr René Dubos, Invited Editorial, *Life* Magazine, 1970 [1].

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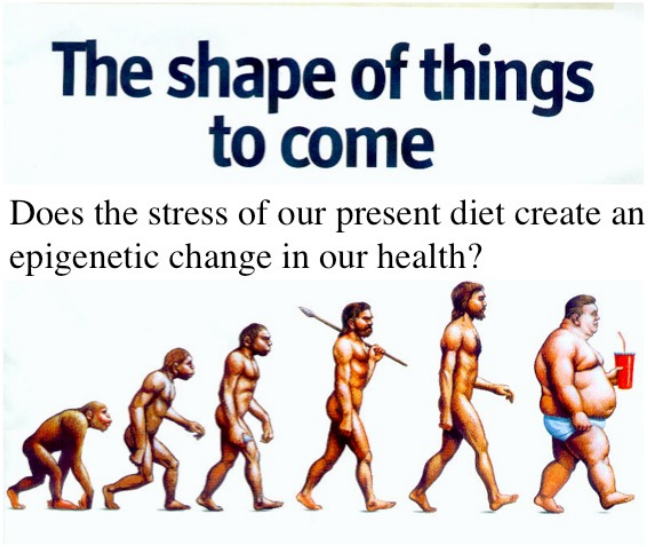
The shape of things to come
Does the stress of our present diet create an epigenetic change in our health?

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!Kung people
Kalahari Desert, Botswana

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Courtesy Jeff Leach PhD

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Courtesy Jeff Leach PhD

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Courtesy Jeff Leach PhD

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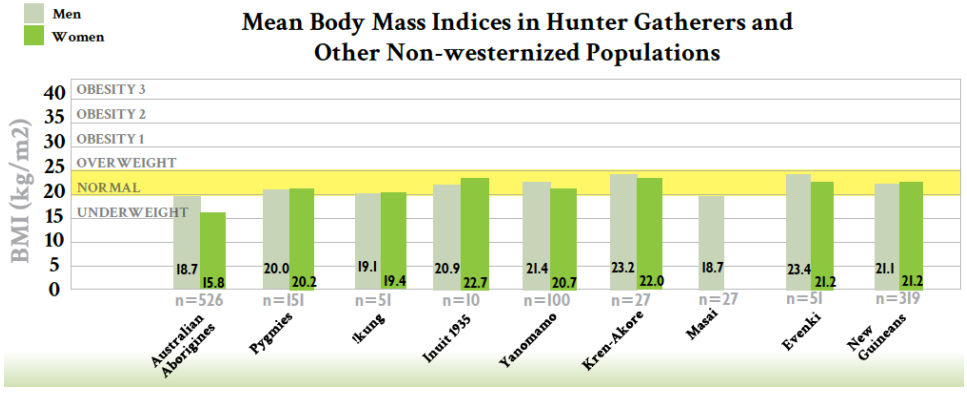

Courtesy Loren Cordain PhD

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Epigenetics in Primates

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Robert Sapolsky PhD Stanford

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From Robert Sapolsky PhD

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Robert Sapolsky PhD Stanford

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From Robert Sapolsky PhD

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Junk Food Monkeys

- Much heavier with more body fat
- Metabolic Syndrome
- Insulin resistant with elevated fasting and post-prandial insulin levels
- Increased TGAs
- Move a lot less
- Socialized and play less
- High Infertility
- Die younger

From Robert Sapolsky PhD

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Effects of Traditional and Western Environments on Prevalence of Type 2 Diabetes in Pima Indians in Mexico and the U.S.

Leslie O. Schulz, PHD[1], Peter H. Bennett, MB, FRCP[2], Eric Ravussin, PHD[3], Judith R. Kidd, PHD[4], Kenneth K. Kidd, PHD[4], Julian Esparza, MS[5] and Mauro E. Valencia, PHD[5]

CONCLUSIONS—The much lower prevalence of type 2 diabetes and obesity in the Pima Indians in Mexico than in the U.S. indicates that even in populations genetically prone to these conditions, their development is determined mostly by environmental circumstances, thereby suggesting that type 2 diabetes is largely preventable. This study provides compelling evidence that changes in lifestyle associated with Westernization play a major role in the global epidemic of type 2 diabetes.

Prevalence of type 2 DM 5 times higher in Arizona Pima's compared to Mexican Pima's.

Diabetes Care August 2006 vol. 29 no. 8 1866-1871

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Epigenetics in humans

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www.StrangeCosmos.com


HOMELAND SECURITY

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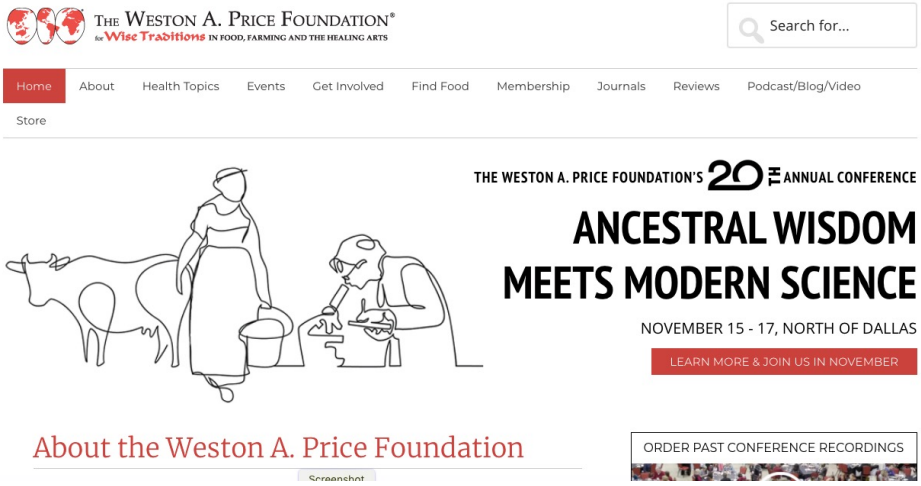
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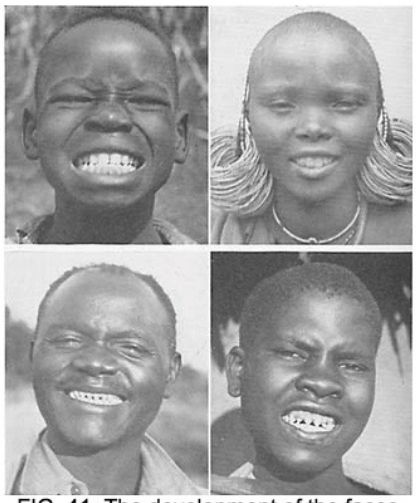

FIG. 41. The development of the faces and dental arches in many African tribes is superb. The girl at the upper right is wearing several earrings in the lobe of each ear. The Wakamba tribe points the teeth as shown below. This does not cause tooth decay while they live on their native food.

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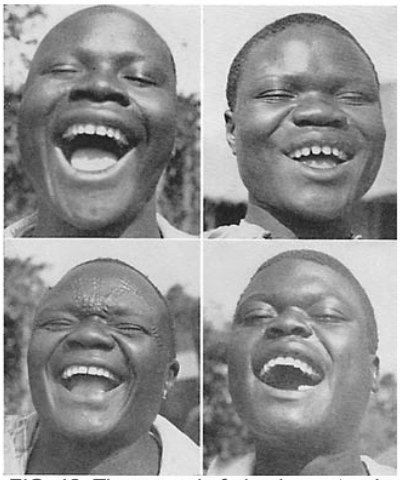

FIG. 42. The reward of obeying nature's laws of nutrition is illustrated in this west Nile tribe in Belgian Congo. Note the breadth of the dental arches and the finely proportioned features. Their bodies are as well built as their heads. Exceedingly few teeth have been attacked by dental caries while on their native foods.

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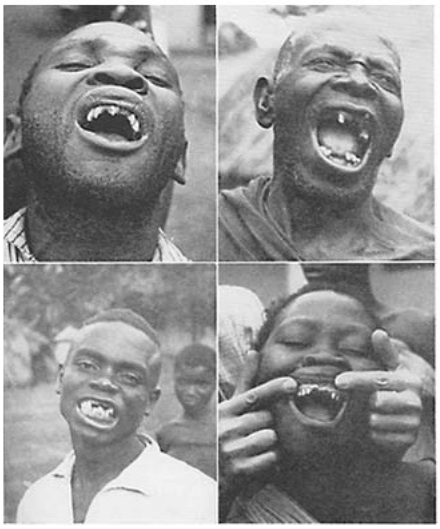

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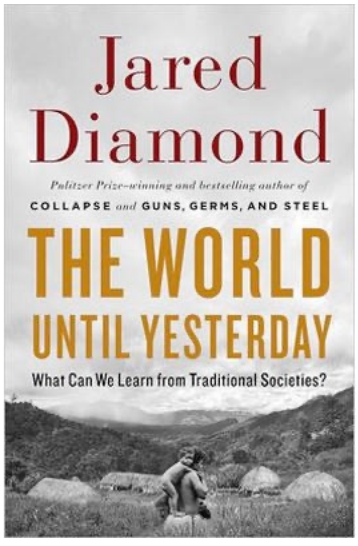
Jared
Diamond
Pulitzer Prize–winning and bestselling author of
COLLAPSE and GUNS, GERMS, AND STEEL
THE WORLD
UNTIL YESTERDAY
What Can We Learn from Traditional Societies?

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"About 75% of the food in the Western diet is of limited or no benefit to the microbiota in the lower gut. Most is comprised specifically of refined carbohydrates, is readily absorbed in the upper GI tract, and what eventually reaches the large intestine is of limited value, as it contains only small amounts of the minerals, fiber, and other nutrients necessary for maintenance of the microbiota."
Nutrients 2013. 5, 162-207

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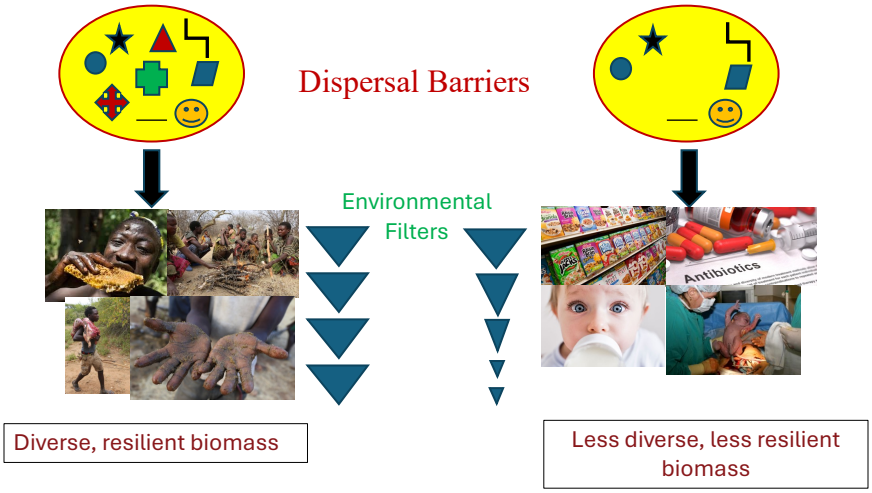

Courtesy Jeff Leach PhD

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Reclaiming and maintaining our metabolic flexibility (ie. mitochondrial health)


Circadian rhythm

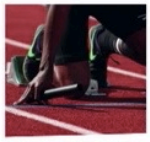

Sleep


Light exposure


Gut health


Meaningful relationships


Lift weights


Go fast


Go slow


Novel experiences

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Logan *et al. Journal of Physiological Anthropology* (2015) 34:9

Compared to our ancestors depicted, a modern urban dweller may experience:

- ↓Natural light; daytime blue portion in particular
- ↓Darkness at night
- ↓Physical activity in natural environments
- ↓Visual contact with features of diverse natural environments
- ↓Auditory processing of natural sounds reflective of biodiversity
- ↓Intake of relatively unprocessed foods; phytochemicals
- ↓Contact with non-pathogenic microbial diversity
- ↓Natural olfactory stimulants;phytoncides
- ↓Tactile contact components of natural environments
- ↓Opportunity for privacy, solitude
- ↓Opportunity to function/sleep in electromagnetic environments that remain unaltered by human intervention
- ↓Relative amounts of negatively charged air ions

Figure 1 Paleo-deficit disorder?

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Biodiversity: species-rich systems can exploit resources more efficiently than species-poor systems; large number of species can imply some level of functional redundancy; high species diversity also implies higher chances of having species that efficiently fulfill functions presented by their environment. *Diversity is expected to increase the resilience of ecosystems whereas a diverse system with high functional redundancy gains in resistance*.

Courtesy Jeff Leach PhD

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