

HUNTER GATHERERS AND THE CRISIS OF CIVILIZATION

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ABSTRACT

Stone Age Economics initiated a lively debate about the quality of hunter-gatherer life that has now lasted fifty years. Since the initial debates a large body of ethnographic evidence, and modern techniques such as DNA analysis, has confirmed Marshall Sahlins' basic insights. Prior to the widespread adoption of agriculture human societies were characterized by egalitarian social structures and economies based on the sustainable use of environmental resources. Only after agriculture and state societies did hierarchical caste systems and exploitation of nature become the norm. Today, inequality has reached staggering levels and exploitation of the natural world has decimated non-human nature and undermined the climatic stability that made modern agriculture and civilization possible. *Homo sapiens* existed for some 300,000 years without these human-caused existential threats. Hunter-gatherers tell us that (1) it is not "human nature" to be greedy and exploitative, and (2) hierarchical and repressive societies are not "natural" to the human condition. Pogo was wrong. The enemy is not "us" but rather the peculiar economic system we stumbled into 10,000 years ago. Understanding how hunter-gatherer economies functioned as social systems has direct relevance for today's environmental and social policies.

Keywords: Agricultural Transition, Egalitarian Societies, Hunter-Gatherers, Pleistocene Overkill.

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The contemporary industrial world exists in highly structured societies at immensely high densities and enjoys luxuries of technology that foragers could hardly imagine. Yet that world is sharply divided into have and have nots, and after only a few millennia of stewardship by agricultural and industrial civilizations the environments of large portions of the planet lie in ruins. Therefore the hunter-gatherers may well be able to teach us

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something, not only about past ways of life but about long-term human futures as well. If technological society is to survive it may have to learn the keys to longevity from fellow humans whose way of life has lasted at least one hundred times longer than industrial commercial “civilization”.

Richard Lee 1998: x

INTRODUCTION

A half century ago Lee and Devore (1968) published their challenge to orthodoxy in *Man the Hunter*, a collection of field studies detailing how existing hunter-gatherers actually lived. This was followed by Marshall Sahlins' (1972) *Stone Age Economics*. The research documented in these books showed that the traditional societies of the San of the Kalahari, The Hadza of Tanzania, the Inuit, and the Australian Aborigines had abundant leisure time, rich social lives, an egalitarian social structure, and a sustainable relationship with the plants and animals they depended on for survival. After the publication of this influential work there was a predictable reaction against the positive portrait of hunter-gatherers (Alvard 1998; Keely 1996; Kelly 1995). Critics made valuable contributions including pointing out the importance of neighboring agriculturalists to contemporary hunter-gatherers, and the variety of hunter-gatherer adaptations to local environments (Lee 1992; Suzman 2019). But recent studies have verified the general characteristics of hunter-gatherers described by Lee, Marshall, Sahlins, Woodburn and others. Hunter-gatherer societies were egalitarian (Boehm 1993, 1997; Pennisi 2014) generally peaceable (Culotta 2013; Fry and Söderberg 2013; Ryan and Jethá 2010), and they did not negatively impact the ecosystems they were embedded within (Suzman 2017, 2019). Recent studies using modern techniques of analysis (DNA and proteins) have provided a powerful new line of evidence supporting the idea that prior to the widespread adoption of agriculture some 10,000 years ago human societies were characterized by egalitarian social structures and the sustainable use of environmental resources.

Today we face seemingly insurmountable threats to the long-term viability of our global market economy. Inequality has reached truly staggering levels. Exploitation of the natural world has decimated non-human nature and is threatening the climatic stability that made civilization possible. *Homo sapiens* existed for at least 300,000 years without these human-caused existential threats. We can we learn much from hunter-gatherers about the current crises facing us. The hunter-gatherer way of life shows us that (1) “human nature” does not condemn us to be greedy and exploitative, (2) hierarchical societies are not “natural” and (3) human values are not universal but are shaped by the way we make a living.

1. WHO ARE THE HUNTER-GATHERERS?

Great confusion exists about what characterizes hunting and gathering societies. A good definition is given by Panter-Brick *et al.* (2001):

Hunter-gatherers rely upon a mode of subsistence characterized by the absence of direct human control over the reproduction of exploited species, and little or no control over other aspects of population ecology such as the behavior and distribution of food resources.¹

A further elaboration is given by Woodburn (1982) who distinguishes between *immediate return* and *delayed return* hunter-gatherers. Immediate return hunter-gatherers have the following characteristics:

People obtain a direct and immediate return from their labour. They go out hunting or gathering and eat the food obtained the same day or casually over the days that follow. Food is neither elaborately processed or stored. They use relatively simple, easily acquired, replaceable tools and weapons made with real skill but not involving a great deal of labor.

Delayed return hunter-gatherers have more complex technologies and capital in the form of nets, boats, traps and other material artifacts. Producing food may take place over long time periods of months or even years. Some storage is present and wild crops are selectively tended. Neither delayed nor immediate return hunter-gatherers practice agriculture, horticulture or animal husbandry.

Much of the negative characterization of hunter-gatherers lumps together hunter-gatherers, small scale agriculturalists, and contemporary marginalized peoples who hunt using modern weapons and engage in trade with a dominant culture (Keely 1996; Krech 1999; Pinker 2011). For example, Kelly (1995) refers to “sedentary hunter-gatherers” as practicing horticulture and having settled communities and domestic animals. Steven Pinker, in a TED talk decrying the human propensity to violence,² presents evidence of “hunter-gatherer” violence using examples from Keely’s 1996 book *War before Civilization*. Of the seven cultures he discusses, only the

¹ The key phrase is “direct human control”. Direct control of all stages of food production and distribution initiated a number of unique changes, including a very complex division of labor, that led to large city states and hierarchical societies with access to economic surplus based on hereditary wealth and power. Agriculture fundamentally transformed the relationships between people, and between people and natural world.

² https://www.ted.com/talks/steven_pinker_on_the_myth_of_violence (accessed March 18, 2021).

Murugin aborigines from Australia might remotely be considered hunter-gatherers, but the data for them was collected in 1975, decades after they had been absorbed by commercial society. None of the cultures listed by Pinker represent our ancestral immediate-return hunter-gatherers (Ryan and Jethá 2010, 183-185). Agriculturalists, including simple horticulturalists and pastoralists, are not hunter-gatherers. Neither the Polynesian Maoris who killed the last Moa, nor the buffalo hunting Plains Indians, nor those responsible for the extinction of the Dodo in the 1600s, were hunter-gatherers.

2. HUNTER-GATHERERS WERE EGALITARIAN: SOCIAL HIERARCHIES ARE NOT AN INEVITABLE FEATURE OF HUMAN SOCIETIES

Sociality, caring for others and cooperation with non-kin, are important characteristics of the human species (Frith and Frith 2010; Sober and Wilson 1998). These traits not only made it possible for humans to flourish and survive the extreme environmental changes of the Pleistocene, they also fostered sustainable use of environmental resources and egalitarian social arrangements. In hunter-gatherer bands, these traits worked both for the benefit of the group and for individuals within the group. Small-scale human societies have developed myriad forms of social organization to minimize within-group conflicts and to ensure that no individual or group of individuals can dominate. Every member of the group had access to the means of making a living. Woodburn writes of immediate return (simple technology and material culture) hunter-gatherers:

Without seeking permission, obtaining instruction, or being recognized as qualified (except by sex) individuals in these societies can set about obtaining their own requirements as they think fit. They need considerable knowledge and skill but this is freely available to all who are of the appropriate sex and is not, in general, transmitted by formal (or even informal) instruction: rather it is learnt by participation and emulation. In most, but not all, of these societies neither kinship status nor age is used as a qualification to obtain access to particular hunting and gathering skills or equipment (Woodburn 1982: 438).

The status of women in hunter-gatherer societies was generally equal to men's. Leacock (1998) suggests that "autonomy" is a better word than "equality" to describe gender relationships in these societies: "They held decision-making power over their own lives and activities the same way that men did over theirs". She argues that individual autonomy was necessary to support the hunter-gatherer way of life.

The fact that consensus, freely arrived at, within and among multifamily units was both essential to everyday living and possibly has implications that we do not usually confront. Individual autonomy was a necessity, and autonomy as a valued principle persists to a striking degree among the descendants of hunter/gatherers. It was linked to a way of life that called for great individual initiative and decisiveness along with the ability to be extremely sensitive to the feelings of lodge-mates. I suggest that personal autonomy was concomitant with the direct dependence of each individual on the group as a whole. Decision making in this context calls for concepts other than ours of leader and led, dominant and deferent, no matter how loosely these terms are seen to apply (Leacock 1998: 143).

The success of hunter-gatherer bands depended on both autonomy and cooperation. Living off flows from nature required freely available knowledge about the hundreds of plants and animals they depended on, as well as flexibility and decentralized decision making. Women in immediate return societies, to the extent that they were the gatherers, provided the bulk of calories and they had direct access to the knowledge and resources they needed to secure their own food.

As Sahlins argued, orthodox economic theory cannot explain hunter-gatherer behavior. Hunter-gatherer egalitarianism (sharing) is sometimes reduced to “risk reduction reciprocity”, that is, hunters share their kill and gatherers share their plant food because of the uncertainty inherent in hunting and gathering. A hunter shares his kill because he is likely to be unsuccessful in the future and will need food from another hunter. But Hawkes *et al.* (2001) found that this explanation does not explain sharing among the Hadza of Tanzania. Among the Hadza the successful hunter does not control the distribution of the meat. They write:

These data and analyses do not support the proposition that the shares households receive from the kills of others are contingent on reciprocal shares from kills made by the hunter in those households. At least 90% (usually more) of the meat of large prey goes outside the hunter’s household. In our sample of household shares, the men who supplied more meat to others did not get more meat from them. Poorer or less hard-working hunters were no more likely to be excluded from the kills of others, or to get smaller shares. ... Moreover, the men who were more skilled hunters spent more time at it, magnifying the disproportionate contribution they made to the diets of their neighbors. To the extent our sample is representative, the meat hunters supplied to others was not repaid by meat from them. The proposition that hunters share meat so they will get meat repayments later is, on these grounds, implausible. Risk reduction reciprocity does not explain the persistence of widespread meat sharing among the Hadza (Hawkes *et al.* 2001: 130).

Boehm (1993) describes hunter-gatherers as having an ethos of “reverse dominance hierarchy”. He argues that egalitarianism in these societies is

deliberately shaped by the attitudes of members of these societies. Woodburn (1982) recognizes the importance of sanctions on accumulation but cites other reasons as to why immediate return hunter-gatherers are aggressively egalitarian: equal access to food and other resources, mobility and flexibility, and access to means of coercion. Capital in immediate return societies is simple and immediately accessible. It is intangible since it is comprised of freely available information about resource availability (Veblen 1908). It is not a physical thing that can be controlled, manipulated and confiscated. The features of modern society that drive inequality – private property and hereditary wealth – were largely absent in immediate return hunter-gatherer societies.

New evidence for egalitarianism among hunter-gatherers is provided by DNA analysis of the structure of hunter-gatherer groups. Dyble *et al.* (2015) found that that human hunter-gatherer bands, in contrast to other great ape social groups, have “fluid social networks where family units are relatively autonomous, with couples and their children moving often between bands, living with kin of either the husband or the wife”. They present an agent-based model showing that if men and women are equally likely to decide the group of residence after marriage (with the husband’s family or the wife’s family) the result will be the observed relatively low within-group relatedness. By contrast, DNA analysis of early agricultural communities (about 4,000 years ago) in the Lech River valley in Bavaria found evidence of patrilocality, and social differentiation based on gender and class (Mittnik *et al.* 2019). One of the most striking findings was an absence of adult daughters from the local communities, and the presence of foreign women of unknown origin. In this society women traveled far from home to marry while men stayed home and kept wealth in their families (Gibbons 2019: 168).

Borgerhoff Mulder *et al.* (2009) in a study of wealth inequality in 21 small-scale societies, found a strong ethos of equality among hunter-gatherer bands, and more economic stratification among agriculturalists. They attribute this to the intergenerational transmission of wealth. Carneiro (1981) argues that power leads to surplus production, not the reverse. But the argument about which came first, power or surplus is probably fruitless. Surplus made the intergenerational transfer of wealth, and the means of producing it, possible and this encouraged those in power to coerce even more surplus production. In any case, it was agriculture and surplus production that gave rise to hierarchical societies and eventually large-scale repressive states (Gowdy 2021; Gowdy and Krall 2016; Scott 2019). As Lee (1990: 239) puts it: “[T]he development of inequality is first and foremost a consequence of food production. Foragers directly appropriate from nature; farmers and herders by contrast depend far more on *improvements* upon nature and the *husbandry* of resources”.

An aspect of equality is sympathy and compassion for others that may be less fortunate. Such traits were present in the Pleistocene. Spikins *et al.* (2018) discovered that Neanderthals cared for severely injured individuals including a male aged 35-50 at the time of his death, whose degenerative disease would have made it impossible to care for himself long before his death. A Neanderthal individual found at Shanidar I cave in Iraq showed extensive debilitating injuries including the loss of an arm, serious wounds to his right leg and loss of hearing (Trinkaus and Villotte 2017). Spikins observes: “Our findings suggest Neanderthals didn’t think in terms of whether others might repay their efforts, they just responded to their feelings about seeing their loved ones suffering”.³ Evidence from the Sima de los Huesos site in Spain, dated at 400,000 years ago, indicates that a child with craniosynostosis (Gracia *et al.* 2009), an individual with deafness, and an elderly man who would have had trouble walking (Bonmatí *et al.* 2010), were cared for for several years (Gracia *et al.* 2009). Even earlier evidence for long-term care of severely injured individuals comes from a *Homo erectus* site dated at 1.6 million years ago (Walker *et al.* 1982). Despite evidence to the contrary, the belief in the moral superiority of modern humans continues to mar our appreciation of the humanity of our Pleistocene ancestors.

3. HUNTER-GATHERERS AND SUSTAINABILITY: THE RAPACIOUS EXPLOITATION OF NATURE IS NOT DUE TO “HUMAN NATURE”

The question “what is human nature” is central to public policy and the nature of the human presence on planet earth. The belief that humans are “killer apes” doomed to exterminate everything in their path is widespread. Population ecologist William Rees blames the current decimation of the natural world on human nature:

Humans may pride themselves as being the best evidence for intelligent life on Earth, but an alien observer would record that the (un)sustainability conundrum has the global community floundering in a swamp of cognitive dissonance and collective denial...Indeed, our alien friend might go so far as to ask why our reasonably intelligent species seems unable to recognize the crisis for what it is and respond accordingly. To begin answering this question, we need to look beyond conventional explanations – scientific uncertainty, societal inertia, lack of political will, resistance by vested interests, and so on – to what may well be the root cause of the conundrum: human nature itself.⁴

³ Quoted in *Science Daily*, <https://www.sciencedaily.com/releases/2018/03/180313130443.htm> (accessed March 16, 2021).

⁴ <http://www.postcarbon.org/publications/human-nature-of-unsustainability/> (accessed March 16, 2021).

The view that our species is doomed species because we have evolved to be unrepentant mass murderers of our fellow humans and other species is so widespread it might be considered a dominant worldview – we are genetically programmed to be selfish and rapacious and there is nothing we can do about it. This view is summarized succinctly by Dave Pollard:⁵

We humans have not changed and cannot change what we are, what we do, how we behave or what we value. We are doomed by the coding in our DNA to continue along our inexorable path of self-destruction, and to inflict large-scale but ultimately transitory damage on our planet in the process.

If this view is true, we are left with nothing but despair and handwringing over our inevitable fate. But if it's "human nature" to ravish the natural world how did *Homo sapiens*, living in an innumerable variety of cultures and local environments, live sustainably on planet Earth for 300,000 years? Studies using genome sequencing indicate that the Khoisan people inhabited Southern Africa continuously for over 150,000 years. The Khoisan were the largest population of *Homo sapiens* on the planet for most of human history (Kim *et al.* 2014). The *Homo erectus* Acheulian hand-axe tradition flourished for 1.5 million years. The Neanderthal Mousterian culture, with regional variations, lasted 300,000 years. Even after agriculture many small-scale human societies lived in harmony with nature with stable populations and sustainable resource use. Humans are capable of almost any type of behavior depending on underlying institutional structures and the behavioral patterns arising from the requirements of particular economic systems. Blaming human nature for the current assault on the natural world is a defeatist position. If human cultures have always been unsustainable and characterized by overshoot and collapse nothing can be done. It's an apolitical easy way out that blames all humans as individuals, regardless of cultural context, and precludes a deeper analysis of the way specific cultures and economic systems encourage or discourage rapacious exploitative behavior.

3.1. *The Pleistocene overkill hypothesis*

Central to the human-nature-and-the-environment debate is the widespread belief in the Pleistocene overkill hypothesis – the idea that the disappearance of megafauna from North America, Europe, and Australia was caused by a sudden blitzkrieg of extinctions perpetuated by human hunter-

⁵ <https://howtosavetheworld.ca/2005/05/02/the-end-of-philosophy/> (accessed March 16, 2021).

gatherers. The tone of this view is illustrated by the title of a paper by the late Paul Martin, the chief proponent of the overkill hypothesis: “40,000 years of extinctions on the ‘planet of doom’” (Martin 1990). This view is accepted uncritically by many thoughtful popular commentators (Harari 2015; Kolbert 2014; Monbiot 2014; Wright 2004) and most ecologists. It is rejected by most archaeologists, including those doing the primary research on the relationship between climate change, Pleistocene hunting, and megafaunal extinctions (Nagaoka, Rick, and Wolverson 2018). It may be premature to say that the Pleistocene overkill hypothesis is dead but scientific opinion has swung strongly against it.

Grayson and Meltzer (2003) argue that the hunter-gatherer overkill hypothesis is not supported by evidence and that it represents a convenient “evil human nature” worldview supported both by environmentalists and developers. It is a convenient story used to blame the environmental destructiveness of the Anthropocene on ethical shortcomings of individual humans. It supports the belief that humans are a uniquely predatory species – highly evolved killer apes that always outcompete and eliminate all others. This view appeals to conservationists who use the “original sin” idea to argue for redemption through conservation. The most avid proponent of the overkill blitzkrieg hypothesis was Paul Martin who used the idea to promote “rewilding” of the planet to make amends for human-caused extinctions. Monbiot (2014) makes a similar argument for rewilding the world to make amends for our destructive nature.⁶ On the other side, the overkill hypothesis is also used by ecomodernists who argue that human domination of nature is natural, and therefore good.

Many megafaunal extinction studies are flawed because of the lack of precise dates about extinctions, human arrivals and climate (Price *et al.* 2018). But the most careful and detailed studies point to climate change as the culprit. Cooper *et al.* (2015) present forensic DNA evidence about Pleistocene Holarctic (North America and Europe) megafaunal turnover. Environmental DNA analysis has revolutionized the study of past and present distributions of species (Seymour 2019). Traces of genetic material from soil, water or ice can be used to detect the presence of plants and animals, and the structure of ecosystems, as far back as 50,000 years or more ago. Cooper *et al.* (2015) found that rapid climate change, particularly rapid warming events, were responsible for megafauna extinctions whether humans were present or not. Furthermore, megafauna extinction occurred in

⁶ Rewilding is a powerful idea rapidly gaining traction, but Pleistocene overkill is a poor argument for it. A better one is that humans lived in harmony with other species for most of human existence, and that a healthy natural world is essential for a physically and emotionally healthy human population (MACKINNON 2013).

earlier warm periods in places where humans were not present. The results are summarized in the *New Scientist*:

Cooper and colleagues have simultaneously produced an unprecedentedly accurate map and timeline of changes in megafauna populations around Eurasia and North America, and precisely matched that timeline up with ancient climate records. It punches a hole in a key argument of the prosecution. This states that climate cannot have caused megafauna extinctions because it has changed so much over the past 60,000 years. There were lots of warm and cool periods – interglacial and glacial epochs, respectively. If climate change is the real megafauna killer, why did the animals survive those events only to die when humans turned up in their region? The new data show that they did not survive. Megafauna extinctions were actually relatively common during the past 60,000 years whether humans were around or not (Slezak 2015: 1).

In the Late Pleistocene extinction events clustered in periods of warming including a period 37,000-32,000 years ago and at the end of the Pleistocene 14,000 to 11,000 years ago. Cooper *et al.* (2015: 605) conclude: “Our results lend strong empirical support to the hypothesis that environmental changes associated with rapid climatic shifts were important factors in the extinction of many megafaunal lineages”. Humans may have had a role in some megafaunal extinctions. But applying the *coup de grâce* after a climate-change-induced depopulation event is not the same as causing the extinctions. Mammoths co-existed with humans in Siberia for about 30,000 years, and only became extinct after the last ice age ended (MacDonald *et al.* 2012). The big climate event triggering environmental changes in the last few million years is the Holocene beginning about 12,000 ago. The earth’s climate has been comparatively warm and stable since then. Previous warm periods have been spikes, not prolonged warming.

Striking changes in the earth’s biota occurred only after humans began to practice large-scale agriculture. Lyons *et al.* (2016) looked at DNA evidence showing structure of biotic communities, based on the frequency of aggregated or segregated pairs of taxons,⁷ over the last 300 million years. Pairs of species may be segregated because of negative interactions among species or different habitat preferences. Aggregated pairs may indicate positive species interactions or shared habitat preferences. Lyons *et al.* (2016) found that the percentage of aggregated pairs was stable for the entire 300 million year-long period until it changed abruptly some 6,000 years ago. “This dominance of aggregated pairs persisted with little change for more

⁷ A taxon is a group of organisms that may be classified as a unit. The hierarchical classifications of species, families and orders represent different hierarchies of taxons.

than 300 million years on different continents and across diverse taxa, until about 6,000 years ago, when the sharp transition to the segregated co-occurrence pattern began". Lyons *et al.* (2016) conclude that the rapid expansion in the human population some 6000 years ago explains why species co-occurrence patterns changed so rapidly.

Aggregated pairs dominated from the Carboniferous period (307 million years ago) to the early Holocene epoch (11,700 years before present), when there was a pronounced shift to more segregated pairs, a trend that continues in modern assemblages. The shift began during the Holocene and coincided with increasing human population size and the spread of agriculture in North America. Before the shift, an average of 64% of significant pairs were aggregated; after the shift, the average dropped to 37%. The organization of modern and late Holocene plant and animal assemblages differs fundamentally from that of assemblages over the past 300 million years that predate the large-scale impacts of humans. Our results suggest that the rules governing the assembly of communities have recently been changed by human activity (Lyons *et al.* 2016: 80).

DNA analysis is exonerating hunter-gatherers from driving the population dynamics of specific animals, including their extinction. The title of a paper by Camposa *et al.* (2016) makes this clear: "Ancient DNA analyses exclude humans as the driving force behind late Pleistocene musk ox (*Ovibos moschatus*) population dynamics". Hill, Hill and Widga (2008) studied body size and mortality rates for North American Bison between 37,000 and 250 years ago and conclude "Overall, it appears that the changes in body size were a reaction to environmental conditions rather than the result of human predation pressure".

Another argument for human hunter-gatherer caused massive environmental change is the use of fire. Mooney *et al.* (2011) in a study based on 223 samples of sedimentary charcoal records over the last 70,000 years in Australia found no evidence that human occupation affected the extent of biomass burning in Australia until 200 years ago. Aborigines redirected fires in local ecosystems but did not significantly change the fire regimes that long preceded human arrival. Mooney *et al.* (2011: 28) write: "There is no distinct change in the fire regime corresponding to the arrival of humans in Australia at 50ka (+ or - 10k) years ago. And no correlation between archaeological evidence of increased human activity during the past 40ka and the history of biomass burning".

The objections to the Pleistocene overkill hypothesis may be summarized as follows:

1. We know that "abrupt" climate change has always affected the evolution and distribution of life on earth. Abrupt climate change has driv-

en macroevolution, including major extinction episodes, since complex life appeared on Earth (Vrba 1993);

2. Recent dates for human arrival in Australia and North America show a lack of close temporal correlation between human arrival and megafaunal extinctions;

3. There is a lack of direct evidence for human hunting of animals that became extinct on a scale that would cause extinctions;

4. The claim that megafauna did not go extinct in the absence of humans has been disproved;

5. Extinctions occurred in warm periods. The Holocene was much worse for megafauna because of its unprecedented duration.

4. HUNTER-GATHERERS AS “UNECONOMIC MAN”

Hunter-gatherer behavior toward non-subsistence goods was in sharp contrast to the caricature of “rational economic man” depicted in every standard economics textbook. Wants were limited and the means of obtaining them plentiful. Their mobility, the variety of food sources their vast knowledge allowed them to tap into, and their preference for leisure and socializing over “work”, made material possessions a burden, not a source of prestige. Sahlins (1972: 14) writes: “We are inclined to think of hunters and gatherers as *poor* because they don’t have anything; perhaps better to think of them for that reason as *free*”.

Before agriculture humans lived directly off the flows from nature, not stocks of fertile soil, water, and the other inputs required for food production. When a hunter-gatherer band overshot the carrying capacity of their local ecosystem the results were immediate and obvious. They behaved sustainably not because they were more moral but because their survival depended on it. Among historically observed hunter-gatherers, a wide variety of rules and customs protected against the over-exploitation of nature. The Australian Aborigines, for example, had an elaborate religious and kinship system having at its center a personal and spiritual relationship to the land. Berndt and Berndt (1988) write:

In some areas of the Daly river, the Aborigines were careful about exhausting certain yam beds and always left a residue well scattered for the next season’s crop... Their intimate knowledge of the growth of various creatures, as well as of the increase of vegetable and other plants and trees, led many of them to realize that conservation was essential even in times of plenty. They could not afford to be careless (Berndt and Berndt 1988: 108).

There is no reason to believe there was an absence of social rules regulating exploitation of nature in the Pleistocene. Also, with a lack of markets, an abundance of food for the taking, and a stable population, there was simply no reason to over-exploit the environment, and many incentives not to.

Suzman (2019) writes of the Hadza of Tanzania:

Like the Ju/'hoansi whom Lee worked with, the Hadza typically went out gathering or hunting only when they needed to. They made no effort to store food and only gathered enough food to meet their immediate needs. In seasons when wild fruits were at their most abundant, the Hadza didn't change their behavior to exploit this abundance, perhaps by drying fruit to eat when the seasons turned. Similarly, if for some reason hunting was particularly easy at a certain time of year, they didn't exploit the opportunity to kill and store meat for use when times were lean. Instead they were grateful for an easy hunt but would not hunt again until all the meat was consumed (Suzman 2019: 75).

In contrast to the standard economic behavioral model, the San of the Kalahari work less, not more, when wages are higher (Suzman 2017). Instead, hunter-gatherers have a kind of production quota to reach and they stop working when that quota is met. Such behavior is not limited to hunter-gatherers.⁸ A study of New York city cab drivers showed similar behavior. On rainy days when they met their daily fare quotas quickly, they stop working earlier (Camerer *et al.* 1997). Is it irrational to see an economic windfall as a blessing to ease everyday life, rather than as an opportunity for more material accumulation?

As Sahlins stressed (1972) the notion of scarcity is largely a social construct, not a necessary characteristic of human existence or a mold of human nature. Hunter-gatherers may be considered affluent because they achieve a balance between means and ends by having everything they need and wanting little more. Asked why he did not plant crops a !Kung man replied: "Why should we plant when there are so many mongongo nuts in the world?" (Lee 1968: 33) As a Ju'hoansi song goes, "Those who work for a living, that's their problem!". Hunter-gatherers have few material possessions but much leisure time and, arguably, a richer social life than the "affluent" of the industrialized world. In contrast to hunter-gatherer economies, the modern industrial system generates scarcity by creating unlimited wants. Consumers are addicted to a continual flow of consumer goods and they feel continually deprived because addiction can never be satiated.

⁸ In economic jargon, this is called a "backward bending supply of labor curve". Chayanov (1966) and Sahlins (1972) have discussed this phenomenon in the context of peasant societies.

In Sahlins (1972: 4) words: “Consumption is a double tragedy: what begins in inadequacy will end in deprivation”. The modern addiction to material wealth threatens our psychological well-being as well as the biological and geophysical foundations of our economic system.

5. CULTURE AND HUMAN NATURE: THE POLICY IMPLICATIONS OF A DEEP PERSPECTIVE ON SOCIAL EVOLUTION

All cultures have dominant world views, or “cosmologies”, that guide behavior (Sahlins 1996). The variety of behaviors and world views in different cultures is astonishing. Jains believe that all life is sacred and Jain priests can be seen in India sweeping the sidewalk in front of them as they walk to avoid killing even the tiniest insects. By contrast, the Judeo-Christian tradition teaches us that all of nature was put on earth by God to be used as humans see fit (Whyte Jr. 1967). Recent findings from neuroscience suggest that differences in acculturation, and the resulting value systems, may have a deep genetic basis. In humans, most neurons are formed after birth and develop according to environmental and cultural influences, pointing to the blurred line between genetic heredity and socialization (Wexler 2006). Social differences can arise from the requirements of economic production. For example, rice growing is more of a cooperative activity than growing wheat. Talhelm *et al.* (2014) found major psychological differences between wheat and rice growing regions in China. People in wheat growing areas were more individualistic while those in rice growing areas were more interdependent. As Marx (1859: preface) put it: “The mode of production of material life conditions the general process of social, political, and intellectual life. It is not the consciousness of men that determines their existence, but their social existence that determines their consciousness”.

With the spread of industrial society across the globe, the values of “WEIRD” societies (Western, Educated, Industrial, Rich, and Democratic) (Henrich, Heine and Norenzayan 2010) are replacing those of all other cultures. More and more of the world’s population have come to be dominated by the market mentality. Furthermore, WEIRD values are apparently aberrations – outliers compared to the myriad values of other human cultures. Henrich *et al.* (2010) examined the characteristics of 16 societies around the world, including 14 small-scale societies, and concluded:

Here, our review of the comparative database from across the behavioral sciences suggests both that there is substantial variability in experimental results across populations and that WEIRD subjects are particularly unusual compared with the rest of the species – frequent outliers. The domains reviewed include

visual perception, fairness, cooperation, spatial reasoning, categorization and inferential induction, moral reasoning, reasoning styles, self-concepts and related motivations, and the heritability of IQ. The findings suggest that members of WEIRD societies, including young children, are among the least representative populations one could find for generalizing about humans (Henrich *et al.* 2010: 61).

Large differences among cultures were found in special perception, risk aversion, the perception of nature, social motivation (fairness), and views of “self” (independent or embedded in society). Members of WEIRD societies were outliers on measures of all these characteristics. These “least representative” values are becoming dominant worldwide. It may be that WEIRD people offer a glimpse of what the future world will look like if the economic “rationalization” of human life continues – a world of a one-dimensional culture with little variety for cultural natural selection to work upon.

WEIRD values came to dominate the world after the end of World War Two, a period dubbed the Great Acceleration. World economic production increased from \$4 trillion to \$78 trillion, life expectancy increased from 48 years to 72 years, and world population from 2.5 billion to 7.5 billion. The human population has done well in recent decades in terms of the material well-being of the average person. But these improvements have come at a staggering cost to the non-human world. In terms of evolvability, the evolution of flexibility to adapt to new situations, we have painted ourselves into a corner. Globalization and the homogenization the world’s cultures may be limiting the ability to adjust to change. We are moving toward a single economic system, market capitalism, with its own unique exploitative value system.

Underlying the evolution of human behavior is “evolvability”, a set of possible phenotypic expressions of genes whose presence or absence depends on developmental and environmental circumstances. Humans evolved from biologically diverse populations of hominids whose successful adaptation to changing environments depended on having a wide range of characteristics for natural selection to act on. Likewise, human social evolution has been a story of migrations, conquests, and mixing of customs and beliefs. Selection among groups and synergy from new traits was the raw material for human cultural evolution. For the current dilemmas of human civilization – inequality and unsustainable exploitation of nature – this is good and bad news. It is not human nature to be greedy and destructive, myriad other kinds of behaviors are possible. The dangers of genetic bottlenecks are well-known, equally ominous is the cultural bottleneck as the immense variety of human languages, customs, and belief

systems fall victim to the homogenized global economy. Periods of rapid environmental change drove human cultural and physical evolution. We are entering another period of rapid destabilization when the existing ways of living will be subject to unknown but surely disruptive stress. Cultural variety is disappearing just when we need it the most.

CONCLUDING REMARKS

The view is widespread that humans evolved under conditions of extreme scarcity where only the strongest and most selfish survived. In a world of limited means and unlimited wants, human nature was honed to be selfish and exploitative. This is the world view of selfish gene advocates, free market economists, and much of evolutionary psychology. But mounting evidence indicates that our Pleistocene hunter-gatherer ancestors were generally well-fed, healthy, and egalitarian. Selfish behavior, interpersonal violence, and domination would have been disadvantageous in small groups whose survival depended on cooperation the valued contributions of each member. Altruistic groups out-competed selfish ones. Behavioral incentives changed with the wide-scale adoption of agriculture and the switch from living off day-to-day flows from nature to the reliance on building stocks of food and resources for the future. Scarcity was institutionalized to become the organizational principle of society.

We have entered a period of rapid environmental, social, and political change. In this age of climate change, pandemics, and the rise of xenophobic nationalism, it is easy to be pessimistic about the human prospect. But Sahlins' insights give us hope for the future. After the era of industrial capitalism, with the end of fossil fuels and industrial agriculture as the climate again returns to the instability of the Pleistocene, we may once again return to something like a hunter-gatherer existence (Gowdy 2020). Far from being pessimistic, the vision of returning to a hunting and gathering way of life is wildly optimistic compared to the technological dystopias envisioned by many science fiction authors and social philosophers. Every characteristic that defines us as a species – compassion for unrelated others, intelligence, foresight and curiosity – evolved in the Pleistocene. We became human as hunters and gatherers and we may regain our humanity if we return to that way of life.

REFERENCES

- ALVARD M. 1998, "Evolutionary Ecology and Resource Conservation", *Evolutionary Anthropology*, 7 (2): 62-74.
- BERNDT R. and BERNDT C. 1988, *The World of the First Australians*, Canberra: Aboriginal Studies Press.
- BOEHM C. 1997, "Impact of the Human Egalitarian Syndrome on Darwinian Selection Mechanisms", *American Naturalist*, 150: 100-121.
- BOEHM C. 1993, "Egalitarian Behavior and Reverse Dominance Hierarchy", *Current Anthropology*, 34: 227-254.
- BONMATÍ A. *et al.* 2010, "Middle Pleistocene Lower Back and Pelvis from an Aged Human Individual from the Sima de Los Huesos Site, Spain", *Proceedings of the National Academy of Sciences*, 107 (43): 18386-18391.
- BORGERHOFF M. *et al.* 2009, "Intergenerational Wealth Transmission and the Dynamics of Inequality in Small-Scale Societies", *Science*, 326: 682-688.
- CAMERER C., BABCOCK L., LOEWENSTEIN G. and THALER R. 1997, "Labor Supply of New York City Cab Drivers: One Day at a Time", *Quarterly Journal of Economics*, May: 407-441.
- CAMPOSA P. *et al.* 2010, "Ancient DNA Analyses Exclude Humans as the Driving Force Behind the Pleistocene Musk Ox (*Ovibos Moschatus*) Population Dynamics", *Proceedings of the National Academy of Sciences*, 107: 5675-5680.
- CARNEIRO R.L. 1981, "The Chieftdom: Precursor of the State", in G.D. Jones and R.R. Kautz (eds.), *The Transition to Statehood in the New World*, Cambridge, UK – New York, NY: Cambridge University Press: 37-79.
- CHAYANOV A.V. 1966, *The Theory of Peasant Economy*, Homewood, IL: Richard Irwin.
- COOPER A., TURNEY C., HUGHEN K., BROOK B., McDONALD G. and BRADSHAW C. 2015, "Abrupt Warming Events Drove Late Pleistocene Holarctic Megafaunal Turnover", *Science*, 349: 602-606.
- CULOTTA E. 2013, "Latest Skirmish over Ancestral Violence Strikes Blow for Peace", *Science*, 341: 224.
- DYBLE M. *et al.* 2015, "Sex Equality Can Explain the Unique Social Structure of Hunter-Gatherer Bands", *Science*, 348: 796-798.
- FRITH U. and FRITH C. 2010, "The Social Brain: Allowing Humans to Boldly Go Where no Other Species Has Been", *Philosophical Transactions of the Royal Society of London B*, 365: 165-176.
- FRY D. and SÖDERBERG P. 2013, "Lethal Aggression in Mobile Forager Bands and Implications for the Origins of War", *Science*, 341: 270-273.
- GIBBONS A. 2019, "Bronze Age Inequality and Family Life Revealed in Powerful Study", *Science*, 366: 168.
- GOWDY J. 2021, *Ultrasocial: Human Nature and the Quest for a Sustainable Society*, Cambridge, UK: Cambridge University Press.
- GOWDY J. 2020, "Our Hunter-Gatherer Future: Agriculture, Climate Change, and Uncivilization", *Futures*, 115. <https://doi.org/10.1016/j.futures.2019.102488>.
- GOWDY J. (ed.) 1998, *Limited Wants, Unlimited Means: A Reader on Hunter-Gatherer Economics and the Environment*, Washington, DC: Island Press.
- GOWDY J. and KRALL L. 2016, "The Economic Origins of Ultrasociality", *Behavioral and Brain Sciences*, 39: 1-60.

- GRACIA A. *et al.* 2009, "Craniosynostosis in the Middle Pleistocene Human Cranium14 from the Sima de Los Huesos, Atapuerca, Spain", *Proceedings of the National Academy Sciences*, 106 (16): 6573-6578.
- GRAYSON D. and MELTZER D. 2003, "A Requiem for North American Overkill", *Journal of Archaeological Science*, 30: 585-593.
- HARARI Y. 2015, *Sapiens: A Brief History of Humankind*, New York: Harper.
- HAWKES K., O'Connell J. and JONES N.B. 2001, "Hazda Meat Sharing", *Evolution and Human Behavior*, 22: 113-142.
- HENRICH J., HEINE S. and NORENZAYAN A. 2010, "The Weirdest People in the World?", *Behavioral and Brain Sciences*, 33: 61-135.
- HILL M. Jr., HILL M. and WIDGA C. 2008, "Later Quarternary Bison Diminution on the Great Plains of North America: Evaluating the Role of Human Hunting Versus Climate Change", *Quarternary Science Reviews*, 27: 1752-1771, 1752.
- KEELY L. 1996, *War Before Civilization*, New York: Oxford University Press.
- KELLY R. 1995, *The Foraging Spectrum*, Washington, DC: Smithsonian Press.
- KIM H.L., RATAN A., PERRY G., MONTENEGRO A., MILLER W. and SCHUSTER S. 2014, "Khoisan Hunter-Gatherers Have Been the Largest Population Throughout Most of Modern-Human Demographic History", *Nature Communications*, 5: 6692. Available at: <https://www.nature.com/articles/ncomms6692> (accessed March 16, 2021).
- KOLBERT E. 2014, *The Sixth Extinction*, New York: Picador.
- KRECH S. 1999, *The Ecological Indian*, New York: Norton.
- LEACOCK E. 1998 (1983), "Women's Status in Egalitarian Society: Implications for Social Evolution", in J. Gowdy (ed.), *Limited Wants, Unlimited Means: A Reader on Hunter-Gatherer Economics and the Environment*, Washington, DC: Island Press: 139-164.
- LEE R. 1998, "Forward" in J. Gowdy (ed.), *Limited Wants, Unlimited Means: A Reader on Hunter-Gatherer Economics and the Environment*, Washington, DC: Island Press.
- LEE R. 1992, "Art, Science, or Politics? The Crisis in Hunter-Gatherer Studies", *American Anthropologist*, 94: 31-54.
- LEE R. 1990, "Primitive Communism and the Origin of Social Inequality", in S. Upham (ed.), *Evolution of Political Systems: Sociopolitics in Small-Scale Sedentary Societies*, Cambridge, UK: Cambridge University Press: 225-246.
- LEE R. 1968, "What Hunters Do for a Living, or, How to Make Out on Scarce Resources", in R. Lee and R. Devore, *Man the Hunter*, Chicago: Aldine. Reprinted in Gowdy 1998: 43-63.
- LEE R. and DEVORE R. 1968, *Man the Hunter*, Chicago: Aldine.
- LYONS K. *et al.* 2016, "Holocene Shifts in the Assembly of Plant and Animal Communities Implicate Human Impacts", *Nature*. Doi: 10.1038/nature16447.
- MACDONALD G., BEILMAN D., KUZMIN Y., ORLOVA L., KREMENETSKI K., SHAPIRO B., WAYNE R. and VAN VALKENBURGH B. 2012, "Pattern of Extinction of the Woolly Mammoth in Beringia", *Nature Communications*. Available at: <https://www.nature.com/articles/ncomms1881>(accessed March 16, 2021).
- MACKINNON J.B. 2013, *The Once and Future World*, New York: Houghton.
- MARTIN P. 1990, "40,000 Years of Extinctions on the Planet of Doom", *Palaeogeography, Palaeoclimatology, Palaeoecology*, 82: 187-201.
- MARX K. 1859, *A Contribution to the Critique of Political Economy*, Moscow: Progress Publishers.

- MITTNIK A. *et al.* 2019, "Kinship-Based Social Inequality in Bronze Age Europe", *Science* (early release 10 October). Doi: 10.1126/science.aax6219.
- MONBIOT G. 2014, *Feral: Rewilding the Land, the Sea and Human Life*, Chicago: University of Chicago Press.
- MOONEY S. *et al.* 2011, "Late Quaternary Fire Regimes of Australasia", *Quaternary Science Reviews*, 30: 28-46.
- NAGAOKA L., RICK T. and WOLVERTON S. 2018, "The Overkill Model and Its Impact on Environmental Research", *Ecology and Evolution*, 8: 9683-9696.
- PANTER-BRICK C., LAYDON R., and ROWLEY-CONWAY P. 2001, "Lines of Inquiry", in C. Panter-Brick, R. Laydon and P. Rowley-Conway (eds.), *Hunter-Gatherers: An Interdisciplinary Perspective*, Cambridge, UK: Cambridge University Press.
- PENNISI E. 2014, "Our Egalitarian Eden", *Science*, 344: 824-825.
- PINKER S. 2011, *The Better Angels of Our Nature: The Decline of Violence in History and its Causes*, London: Viking Penguin.
- PRICE G., LOUYS J., FAITH T., LORENZEN E. and WESTAWAY M. 2018, "Big Data Little Help in Megafauna Mysteries", *Nature*, 558, 23-25.
- RYAN C. and JETHÁ C. 2010, *Sex at Dawn*, New York: Harper Perennial.
- SAHLINS M. 1996, "The Sadness of Sweetness: The Native Anthropology of Western Cosmology", *Current Anthropology*, 37: 395-428.
- SAHLINS M. 1972, *Stone Age Economics*, Chicago: Aldine.
- SCOTT J. 2018, *Against the Grain*, New Haven, CT: Yale University Press.
- SEYMOUR M. 2019, "Rapid Progression and Future of Environmental DNA Research", *Communications Biology*. <https://doi.org/10.1038/s42003-019-0330-9>.
- SLEZAK M. 2015, "Megafauna Extinction: DNA Evidence Pins Blame on Climate Change", *New Scientist*. Available at: <https://www.newscientist.com/article/dn27952-megafauna-extinction-dna-evidence-pins-blame-on-climate-change/> (accessed March 16, 2021).
- SOBER E. and WILSON D.S. 1998, *Unto Others*, Cambridge, MA: Harvard University Press.
- SOLWAY J. and LEE R. 1990, "Foragers, Genuine or Spurious: Situating the Kalahari San in History", *Current Anthropology*, 31: 109-146.
- SPIKINS P., NEEDHAM A., TILLEY L. and HITCHENS G. 2018, "Calculated or Caring? Neanderthal Health Care in Social Context", *World Archaeology*, 1. DOI: 10.1080/00438243.2018.1433060.
- SUZMAN J. 2019, *Affluence Without Abundance*, London: Bloomsbury.
- SUZMAN J. 2017, "Why 'Bushman Banter' Was Crucial to Hunter-Gatherers' Evolutionary Success", *The Guardian*, October 29. Available at: <https://www.theguardian.com/inequality/2017/oct/29/why-bushman-banter-was-crucial-to-hunter-gatherers-evolutionary-success> (accessed April 27, 2021).
- TALHELM T., ZHANG X., OISHI S., SHIMIN C., DUAN D., LAN X., and KITAYAMA S., "Large-Scale Psychological Differences within China Explained by Rice Versus Wheat Agriculture", *Science*, 344: 603-608.
- TRINKAUS E. and SÉBASTIEN V. 2017, "External Auditory Exostoses and Hearing Loss in the Shanidar 1 Neanderthal", *PLOS*, 20 October. <https://doi.org/10.1371/journal.pone.0186684>.
- VEBLEN T. 1908, "On the Nature of Capital", *The Quarterly Journal of Economics*, 22 (4): 517-542.

- VRBA E.S. 1993, "The Pulse That Produced Us", *Natural History*, 102 (5): 47-51.
- WALKER A., ZIMMERMAN M.R. and LEAKEY R. 1982, "A Possible Case of Hypervitaminosis A in Homo Erectus", *Nature*, 296 (5854): 248-250.
- WEXLER B. 2006, *Brain and Culture*, Cambridge, MA: MIT Press.
- WHITE JR. L. 1967, "The Historical Roots of Our Ecological Crisis", *Science*, 155 (3767): 1203-1207.
- WOODBURN J. 1998 (1982), "Egalitarian Societies", in *Limited Wants, Unlimited Means: A Reader on Hunter-Gatherer Economics and the Environment*, Washington, DC: Island Press: 87-110.
- WOODBURN J. 1968, "An Introduction to Hadza Ecology", in I. Devore and R. Lee (eds.), *Man the Hunter*, Chicago: Aldine.
- WRIGHT R. 2004, *A Short History of Progress*, Cambridge, MA: De Capo Press.