Complexity Theory, Lovelock's Gaia and Tribal Peoples*

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ABSTRACT

In his recent book, 'The Revenge of Gaia' (2006), James Lovelock contends that the earth, or Gaia, is a living system and around 100,000 years ago tribal peoples initiated a succession of events that could culminate in the end of humanity on the planet. Likely responses to Lovelock's argument: from American Indians, Western optimists, and Western pessimists, are critically assessed from the perspective of complexity theory. If Lovelock turns out to be right, Gaia will continue, perhaps with neo-tribal societies re-emerging and participating in a future process of Gaian self-organization and evolution. Gaia is not sentient and indifferent to the survival of individual species. If a disaster wipes out humanity entirely, Gaia will probably continue despite everything as a living complex system.

INTRODUCTION

In his most recent book, *The Revenge of Gaia*, James Lovelock (2006) argues that in a metaphorical sense, earth is a living system, but not sentient. Although ancient people lived in harmony with Gaia, around 100,000 years ago tribal peoples initiated a chain of events that may cause our own demise. I will present responses to Lovelock's argument from three imagined perspectives: American Indians, Western optimists, and Western pessimists. Ideas informed by complexity theory address each response, Lovelock's argument, and the future of Gaia.

If Lovelock turns out to be right and accelerated global warming or one of a number of other planet-wide disasters does occur,

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Gaian evolution will continue, perhaps with a neo-tribal humanity as a part of a continued process of system self-organization. Earth history suggests that Gaia is indifferent to the survival of individual species. If a disaster entirely wipes out humanity, most life on the Earth is microbial, and Gaia will quite likely continue on as a living and evolving complex system.

LOVELOCK'S ARGUMENT

Lovelock thinks that 'a long time ago… we were an animal, a primate, living within Gaia and different from other species only in unimportant ways… We had our niche in the evolutionary system, and our numbers were probably not more than a million. As intelligent predators, we… could throw stones, use simple stone and wood tools, and do it better than other primates' (Lovelock 2006: 143). But then human involvement with global dynamics began to upset the delicate balance of the system (Westbroek 2004: 418). 'It could have started 100,000 years ago, when we first set fire to forests as a lazy way of hunting' (Lovelock 2006: 6). We became disputatious tribal animals, lazy hunter-killers, and the first great sinners against a living Earth.

'Terrorism and genocide both result from our tribal natures… (W)hy else would we as a mob or a crowd do the evil things that only psychopaths would do alone?' (Lovelock 2006: 9). Lovelock's problem is with tribes, considered as a whole, not individuals. 'We should not think of early humans as better or worse than we are; indeed, they were probably very little different' (*Ibid.:* 144). He seems unaware that in much of the non-Western world, particularly in North America, an intimate and harmonious relationship between tribal peoples and Gaia only began to change a few hundred, not one hundred thousand, years ago.

AN AMERICAN INDIAN RESPONSE TO LOVELOCK

'It remains for us to learn once again that we are a part of nature, not a transcendent species with no responsibilities to the natural world. As we face the twenty-first century…We may well become one of the few species in this vast universe that has permanently ruined our home' (Deloria 1994: 3).

American Indian philosophy has only recently emerged as a defined area within the broader discipline of American Indian

Studies (see Waters 2004). An American Indian worldview generally appears to be compatible with Gaia theory (*e.g.*, Cajete 1994; Deloria 1994; Fixico 2003). For example, similarities between Lovelock's theory of an ideal Gaian world and American Indian worldviews are evident in noted American Indian philosopher and religious scholar Vine Deloria's statement that 'Tribal religions are… complexes of attitudes, beliefs, and practices fine-tuned to harmonize with the lands on which the people live' (Deloria 1994: 70). An American Indian '…religious view of the world… seeks to locate our species within the fabric of life that constitutes the natural world, the land and all its various forms of life' (*Ibid.*: 1).

Although Deloria is comfortable with the language and metaphors of Gaia theory, he would dispute Lovelock's account of ancient tribal life and argue that Indian tribes in North America lived in harmony with Gaia as recently as first contacts with Western explorers and colonists. Deloria thinks we are in a bad situation today because as Western civilization has evolved, it has ignored, trampled and forgotten the established wisdom of tribal peoples (Deloria 2002). In his view, if humanity is to survive on the planet, we must try to recapture the traditional knowledge of Native Americans and reapply it in our lives today.

ACADEMIC PERSPECTIVES ON AN AMERICAN INDIAN RESPONSE TO LOVELOCK

'If the archaeology is not done, the ancient people remain without a history' (Meighan 1999: 2).

Social scientists present conflicting visions of tribal life in North America before the arrival of the first Europeans on the continent. Although supporters of Deloria's view that tribal peoples lived in harmony with Gaia sometimes appear to romanticize tribal life (*e.g.*, 'once upon a time man and animals talked with one another on this continent', honored Mother Earth, and 'lived lightly on the land'), an overall picture emerges of a generally intelligent, hard-working people who lived in ways that were well-matched to their immediate environment (Anderson 2005; Kehoe 2002; Mithen 2004). Where Lovelock sees sinful hunter-gatherers setting fire to forests as a lazy way of hunting, many scholars see 'proto-agriculturalists' and tribal managers of diversified natural economies. And rather than something used destructively, fire was an

essential tool that Native Americans used to manage game, control unwanted vegetation, and rejuvenate grasses (Dods 2002). The result over time was the emergence and maintenance of a mutually causal, supportive, and intimate relationship between native peoples and their natural Gaian environment.

Many other social scientists support Lovelock's negative view of pre-historic tribes and tribalism and argue it is a myth that 'primitive societies' lived in harmony with their environment through the wisdom of their folkways, and that early Native Americans were the original environmental conservationists (Krech 1999). 'What is certain is that Native Americans not only altered the landscape, they also did considerable damage to animal populations – something most academics… have ignored' (Krech 2005: 54). Scholars supporting a negative image of life in prehistoric North America cite research to suggest that violence throughout the continent was widespread and routine (Bamforth 1994; Keeley 1996; Lambert 2002). 'Warfare was nasty. Men, women, children killed in groups, shot with arrows, clubbed, scalped, decapitated, dismembered. The loss of life was truly appalling, and nobody was spared the disruptions in family life that sudden death inevitable brought' (Milner 2004: 180–181). In part because of the prevalent violence, the health of indigenous people was in rapid decline well before first contacts with Western explorers (Steckel and Rose 2002). A life span of little more than 35 years may have been usual for people living in hunter-gatherer societies 1,000 years before the arrival of Christopher Columbus (Wilford 2002).

So what do we really know about tribal life in pre-contact North America? The quick answer is not a lot. Western philosophers, social scientists, and historians have produced a large body of literature about American Indians. Unfortunately, much of the work on prehistoric Native America is littered with stereotypes, untested assumptions, and oversimplified generalizations; *e.g.*, Rousseau's noble savage, Hobbs's characterization of pre-modern life as nasty, brutal and short, and the image of primitive hunter-gatherers broadly applied to all tribal life. Ancient worldviews are often dismissed as inadequate philosophies and equated with animism, mysticism and primitive myth (*e.g.*, Pepper 1982).

Alice Kehoe has written that '…the prehistoric past does not speak directly to us and we … see its residue through brains al-

ready holding images of how humans live. What is important for sound interpretation is to be conscious and explicit about the models that are used as paradigms' (Kehoe 2002: 5). Unfortunately, the variety of models and theories applied to prehistoric tribes and tribalism can be enormous. For example, within the single discipline of archeology, there are Marxist archeologists, feminist archeologists, Whig archeologists, 'cultural materialists', 'ecological materialists', and postmodern archeologists (*Ibid.*: 4–5).

When American Indians try to look back to come to some understanding of pre-contact life within their own tribes, they encounter many obstacles. Most of the available research about Indians is produced by non-Indians and is loaded with a wide range of methodological problems associated with trying to do empirical research on people that lived hundreds and even thousands of years ago (Mason 2004; Sturtevant 1979). If they try to ignore the work of Western scholars and turn to their own tribal oral histories, they find that most were recorded one hundred or more years ago, probably by non-Indians working through translators. The loss of original languages and memories related to the earliest venues and contexts of recorded oral histories only compounds the problem.

Native Americans and non-Indian scholars alike face an additional problem when trying to look back thousands of years to envision what life was like in a prehistoric North American Gaia. Indigenous peoples across the continent were devastated by Old World infectious diseases and Native Nations were often well into decline *before* Native Americans first made direct contacts with European explorers and colonists (Murray 2003; Vale 2002). Too often, shadowy images of the destitute and drastically reduced remnants of ancient tribes were retained in the fading memories of passing generations of tribal elders, from time to time obtained by historians and other non-Indian observers, and eventually recorded as factual descriptions of once healthy and robust tribal cultures. With a massive die off of Indigenous populations, the once carefully managed, prehistoric landscapes of pre-Columbian protoagriculturalists disintegrated in the relatively short span of two or three hundred years to become the 'virgin forests', 'pristine' topography and the ancient Gaia that Lovelock now associates with tribal peoples living over 100,000 years ago.

A COMPLEXITY-BASED PERSPECTIVE ON AMERICAN INDIANS AND LOVELOCK

Complexity theory, Gaia theory and traditional American Indian worldviews are complementary conceptual frameworks and compatible ways of thinking about and seeing the world. Gaia and complexity theory are rooted in Western science and philosophical traditions and portray the earth as a super-organism, a human ecosystem or a self-organizing system (Harding 2006; Jencks 1997; Lenton and van Oijen 2002; Lewin 1999; Stepp *et al*. 2003). Complexity theory underscores the importance of American Indian tribes as the central units of analysis in this critique of Lovelock's contention that the sinful treatment of Gaia by tribal peoples started all of us on the road to an untimely demise.

Indian tribes have lived as nested subsystems within a North American Gaia for hundreds and perhaps thousands of years and continue to exhibit basic features that identify them as human complex adaptive systems (CAS) (see Peroff 2001, 2003, 2006). Tribes evolve, adapt and maintain their integrity as self-organizing systems. They learn from experience and collectively preserve information in the form of a common body of metaphor (CBM) that is the basis of tribal myth, a common identity or a 'Story of the People' (Cajete 1994). Tribes interact with a place to establish and maintain a niche within and a boundary between themselves and the rest of their physical environment (Jones 2005; Odling-Smee 2003). Tribes spontaneously increase in complexity through a process of mutual causation involving positive and negative feedback loops. Over time, recurrent and persistent patterns of human interaction within the tribe, in interaction with elements of tribe's environment (niche) may evolve to become new emergent tribal properties and behaviors.

Ideas about the origins, early existence, and even about what the proper definition of an American Indian tribe is, vary from theories grounded in Western science (*e.g.*, an African/Asian origin and subsequent migration across the Bering Strait land bridge to North America), to 'fundamentalist' Native American stories and oral traditions that place the origin of tribes in ancestral homelands in North America (Hall 1989; Kehoe 2002). Prior to first contacts with Europeans, shifting alliances of hundreds of Indian nations blanketed the North American continent (Josephy 1994). In Gaia

and complexity terms, North America contained within it a living web of thousands of tribal systems within systems. Go back thousands of years and you would have observed Indigenous communities (human CAS) included in a continent-wide process of Gaian self-organization. Tribes cooperated and competed, divided and multiplied in countless ways to generate persistent patterns of human interaction that from time to time evolved into bands, clans, villages and other emergent tribal properties and behaviors.

When French explorers crossed Lake Michigan in 1634, the people who met them on the western lakeshore were the Menominee Indians. No one knows how long the Menominees have lived where the French explorers found them, but estimates vary from 100's to 1,000's of years (Mason 1997; Menominee Indian Tribe of Wisconsin 2006). Anthropological research suggests that the Menominee Tribe may have emerged as an amalgamation of already existing tribal peoples (Mason 1997). Some Menominee elders believe that the tribe emerged as a combination of bear, eagle, and other already existing clans of ancient Algonquin origins (Beck 2002).

The concept of a common body of metaphor (CBM) is a key to understanding how the Menominee Nation, and other indigenous tribal communities, emerged to become new human complex adaptive subsystems within an ancient Gaian environment. When, for whatever reason, the people who would become the first Menominee tribal members became separated from the people around them, new experiences immediately began to shape a distinctive shared vision of reality and new tribal identity. This emerging distributed meaning of things – a common body of metaphor – grew and evolved with new experiences to guide subsequent actions and behavior. Members of the newly emergent tribe now began to understand things in terms of a growing knowledge of things known distinctively to them as shared images, ideas, symbols, and other metaphorical constructs.

At some point, the new Menominee CAS became a small, but independent, self-organizing, nested Gaian subsystem in its own environmental niche. Menominee traditional knowledge accumulated and retained in the tribe's common body of metaphor, consisted of locally distributed and observed Menominee rules for living as a part of the tribe. It provided a functional understanding of

the relationships between parts of the tribal CAS to one another, to elements of Gaia, and conveyed a Menominee view of the world that made sense of life in a prehistoric Gaian environment.

Living circumstances in a prehistoric Gaian environment may have been difficult or hostile, and the life spans of *individuals* may have been short, but the demonstrated ability of vital and robust Indigenous complex adaptive systems like the Menominee Tribe to adapt, evolve, and survive incredible adversity (of both natural and human origin), from their emergence in prehistoric Gaia to the present suggests that, in some form somewhere on the planet, human tribes, ranging in size from one hundred to three or four hundred people, will endure well into the foreseeable future. In the concluding pages of *The Revenge of Gaia*, Lovelock envisions a future in a hot arid world where 'survivors gather for a journey to the new Arctic centres of civilization' (Lovelock 2006: 159). If his dire predictions about the future of the planet prove correct, the demonstrated survivability of human complex adaptive systems like the Menominee and other Indian Tribes in North America suggests that tribalism may not only endure but re-emerge as the predominant default status of humanity in an increasingly hostile Gaia.

As for preserving, recapturing, or recreating the traditional knowledge that sustained ancient Indian tribes in a prehistoric Gaia, if rapid global warming or some other planet-wide disaster produces a hostile Gaia and a return to tribalism as a default scenario for human survival, some pockets of traditional knowledge in isolated Indigenous human subsystems could well survive, but contrary to the beliefs of many contemporary American Indian traditionalists and philosophers, most useful tribal knowledge would be new knowledge emerging within new and different tribes in a totally new and different Gaian environment.

A WESTERN OPTIMIST'S RESPONSE

Perhaps our descendants will use nanotechnology to turn whole planets into intelligent, living stuff, each atom a processor in a planet-sized, mind… . Whatever projects our descendants pursue, they… will look back on our lives with the wonder, pity and gratitude that we feel for our Paleolithic ancestors. Just as they left their hunter-gatherer lifestyle to build farms and cities, we must now take rational control of our biological destiny, and reach for the stars (Hughes 2006: 72).

There are optimists who think Lovelock is wrong and we will not meet our demise any time in the foreseeable future. They believe that from ancient tribes to the present, we have evolved successfully and one day, with the ever greater contribution of science and technology, humans or perhaps some now unimaginable expression of humanity will move on to the stars.

Lovelock, of course, ridicules human 'dreams of conquest even of other planets' and deplores humanity's wish to rule the earth for their benefit alone (Lovelock 2006: 146). For American Indians, tremendous Western optimism about the future looks like Western hubris and a vision borrowed from science fiction, not science (and some Native Americans would not concede the existence of a distinction between science and fiction). Western civilization is the problem. It has gotten us into most of the trouble we are now in on this planet and Western optimism about the future may, in fact, lead us to do things that intensify our reckless disregard for Gaia and to an early demise.

At least some complexity theorists think that Western optimists are naively anthropocentric in their faith in human science and technology and in their belief in our ability to take rational control of our destiny. Nested human subsystems have certainly emerged, evolved, and adapted within a Gaian complex system, but we are merely a part of Gaia and as such, we do not and cannot control Gaia. We may be facing our demise, or one day, humans, intelligent robots or some other expression of humanity may indeed move on to the stars. Complexity theory suggests that these things are possible, but that it is impossible to know such things.

A WESTERN PESSIMIST'S RESPONSE

'More than any other time in history, mankind faces a crossroads. One path leads to despair and utter hopelessness. The other, to total extinction. Let us pray we have the wisdom to choose correctly' (Woody Allen cited in Shapiro 2006).

From the outlook of a Western pessimist, the earth may or may not be 'alive' in a metaphorical sense and Lovelock may be correct that humans are quarrelsome tribal animals who try to rule the Earth and dream of conquering other planets. It does not matter. We are in a very bad situation, and whether ancient tribes were sinful or to blame is irrelevant. Ancient indigenous knowledge and

wisdom is lost and cannot be recaptured or applied to help humanity persevere. Global warming, depleted water resources, and other ominous trends all suggest that we are on an irreversible course to extinction.

American Indians would insist that Western pessimists are wrong about tribalism. Traditional tribal knowledge is relevant and, if adopted, could prove pessimists wrong about the future. Complexity theorists might emphasize their belief that Gaia is a living complex system. Undoubtedly, there are 'complexifiers' who would agree with Western pessimists that a debate over whether ancient tribes were sinful or to blame for today's situation is neither here nor there. They would also agree that ancient knowledge and wisdom emerged in an entirely different context and it is unlikely it can or will be recaptured and usefully applied anytime in the foreseeable future. Still, they would note that a pessimist's certainty that humanity is on an irreversible course to extinction is not unlike the point of view of Western optimists. Both are hopelessly self-centred and preoccupied with the wellbeing of people. There is no indisputable support in complexity theory for either an optimistic or a pessimistic view of humanity's long-term future.

A GAIAN RESPONSE

Lovelock maintains that, 'Gaia now threatens us with the ultimate punishment of extinction' because of the way we have damaged the Earth (Lovelock 2006: 147). My guess is that in the *very* long run the behavior of humans, ancient or modern, will have little relevance to anything. 'In Gaia theory the goal is to keep the Earth habitable for whatever are its inhabitants' (*Ibid.*: 162). Complexity theorists view Gaia is a self-organizing, self-perpetuating complex system that does not want to die. From anaerobic bacteria, trilobites and dinosaurs to the present, Earth history suggests that Gaia is indifferent to the survival of individual species. If, in some form and variety, nested tribal subsystems survive global warming, nuclear proliferation or some other emerging global crisis, biological evolution will continue with humans as a part of the process. Most life on the Earth is microbial. If a future planet-wide disaster wipes out humanity entirely, Gaia will probably continue, despite everything, as a living complex system.

NOTE

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