Climate Change Narratives and the Need for Revisioning of Heritage, Knowledge, and Memory

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Abstract: Issues about heritage, knowledge, and memory are central to climate change narratives. In an age when reality television stars become world leaders, the urgency of climate change narratives requires us to understand the crucial roles of memory and heritage to the future of our planet. The sanctity of knowledge simply cannot be abandoned. Knowledge slips away through the cracks, both in mainstream media efforts to sell its news and in the nonchalance of the admittedly more mindful scholars and popularizers of climate change narratives. We face complex issues here, and there is an urgent need to reassess the value systems and ethics that brought us to where we are in terms of climate change. This is no easy task. To face this complex and controversial issue will require tremendous care with facts, honesty about heritage, and commitment to remembering. It will also need recognition of the painful fact that heritage can no longer be an excuse for continued derogation of the natural environment.
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Climate change narratives reflect a complex and troubled interplay among matters of heritage, knowledge, and memory. Often about imagining futurity – about producing what E. Ann Kaplan calls a "memory of the future" (Kaplan, 2016: 4) – these narratives involve re-workings of the meanings and cultural products of heritage, knowledge, and memory. They call into question precisely *what* qualifies as knowledge, given the increasingly urgent and emotional tones these narratives bear. At stake is not simply the accessibility of knowledge: the very uses and roles of memory and heritage for the future of humanity – and, indeed, the planet – must be revisioned.

One of the obvious problems climate change narratives face in attempting to establish a knowledge base from which to ground action is that there is an enormous rift between what qualifies as knowledge within the two fields that these narratives straddle: the sciences and the humanities. These opposing sides are a dialectic that Michel Serres

famously seeks to reconcile, feeling that "today, we live and think at this intersection" (Serres, 1995: 208). Climate change narratives in mainstream media reveal the complexity of this intersection well. It is an intersection not just of the sciences and the humanities but of genres and ideologies within each.

It is reasonable to question the psychological purposes and effects of climate change discourse (see Estok, 2018) and to posit that one of the reasons for the radical failures of climate change discourse to motivate real social adjustments is that it simply fulfills other apparently more pressing needs. Climate change discourses in mainstream media are generically narrative; in terms of ideology, they are confirmational and do not engage in a meaningful questioning of causal agents in climate change. When people watch, read, or listen to the news, it is not with the intent of obtaining knowledge in any absolute epistemological sense, or of getting a science lesson.

Knowledge consists of data that is real, factual, often verifiable; it is about a relationship with what is true. Falsehoods cannot be known. The *Stanford Encyclopedia of Philosophy* offers a very clear example demonstrating this fairly obvious fact: "Hillary Clinton did not win the 2016 US Presidential election. Consequently, nobody knows that Hillary Clinton won the election. One can only know things that are true" (Ichikawa and Steup). Climate change narratives (both from deniers and supporters), however, often disseminate information that is simply not true[1]. Indeed, with the increasing consciousness of the increasing scale of anthropogenic effects on climate comes increasingly frenzied declarations of pure nonsense in mainstream and popular media, often from well-meaning scholars. If the world is getting hotter, then so too is the market for books on the topic of climate change – hence, a broad appeal of books such as Diane Ackerman's *The Human Age: The World Shaped by Us*, Elizabeth Kolbert's *The Sixth Extinction: An Unnatural History*, Naomi Klein's *This Changes Everything: Capitalism vs Climate*, and so on.

In terms of knowledge production, the value of some of this material is dubious. For instance, when Diane Ackerman explains that "our mistakes are legion, but our talent is immeasurable" (Ackerman, 2014: 14), we face a lot of specious logic. Ackerman talks about how "we rack our sun-smelted brains to find newer ways to capture and enslave the sun" and adds that "wood, coal, oil, and gas were only intermediaries after all, and using them was a sign of our immaturity as a species"

(Ackerman, 2014: 106), but she is missing a plain truth here: our use of renewable resources far pre-dates our use of non-renewables and fossil fuels! She explains that we are "far better at tampering with nature than [in] understanding it" (Ackerman, 2014: 153) but goes on cheerfully to explain that the animals now going extinct because of us "might all haunt the earth again" (Ackerman, 2014: 162) because clever humans had the foresight to save their DNA. Indeed, protecting as much DNA as possible for precisely such purposes is part of what the Svalbard Global Seed Vault is all about (securing an ark for the future), and it is tempting to share in Ackerman's enormous hope, to smile hopefully at the horrific science here.

In her discussion of Genghis Khan, Ackerman claims that "one can only surmise that wiping out the genes of others and planting your own (what we call genocide) must come naturally to our kind, as it does to some other animals, from ants to lions" (Ackerman, 2014: 273). But this kind of comment is neither logical nor defensible. She offers no empirical evidence for such a hypothesis. Some people eat shit. Using Ackerman's logic, we could surmise that eating shit comes naturally to our species. Other comments also simply fly in the face of truth: "Nature is thrifty" (Ackerman, 2014: 281). An average of 200 million sperm per ejaculate does not strike me as thrifty. The 100 year old pine tree outside my window produces thousands of pine cones per year, each with scores of seeds, and I often wonder about the total number seeds the tree has produced, most of which have NOT resulted in trees. Wherefore thrifty? Nor does Ackerman reference any of the pioneering work of ecofeminists about co-inhabiting in a world with other-than-human species: somehow, the work of ecofeminists and the topic of gender do not seem to fit into Ackerman's hopeful discussions. She talks about how "cells might be used to insert more genetic variety into dwindling populations of almost-extinct animals" (Ackerman, 2014: 162), but there is something odd and unsettling in this discussion. The passive voice erases the agent. Cells might be used? By whom? Surely the very agent that has caused the problem in the first place, no? Ackerman's discussion of "dwindling populations of almost-extinct animals" again obscures the agent. These "dwindling populations of almost-extinct animals" are not dwindling by themselves, are not out there being bad populations that we should take control of and help. We are the cause, and the very solutions Ackerman discusses are also the cause. Moreover, it seems a bit

ironic to speak of human exceptionalism in the same breath as she speaks of humanity's subjection to all of the dangers of "the world shaped by us" (the subtitle to her book)! Ackerman explains that "forging a new geological era, we are an altogether different kind of animal from any the planet has ever known, one able to reinvent itself and its world, and manage to survive, despite more twists and turns in daily life than any creature has ever had to juggle" (Ackerman, 2014: 304). Again, this comment does not seem entirely true. Every species is unique and altogether different, and many have survived much longer and much greater challenges – spiders, ants, and crocodiles come to mind.

As if in spite of herself, however, Ackerman is absolutely on target in noting that "we are at a dangerous stage in our evolution as a species: clever, headstrong, impulsive, and far better at tampering with nature than understanding it" (Ackerman, 2014: 153). The scale of our influence is unprecedented – at least for a sentient species[2]. The problem with the proliferation of untrue comments (whether these are that CO_2 is not a primary engine of climate change or that nature is thrifty) is that they stand in the way of knowledge.

As I sat thinking through relationships among heritage, knowledge, and memory within the context of climate change narratives, hurricanes Irma and Maria were making their way across the Caribbean, and news media were tracking them, reporting on the damage they had done and were doing. CNN offered dire warnings of the horrors to come in Florida, but Maria seemed to catch people somewhat by surprise (and one has to wonder how race and class played into all of this). After Maria, headlines included the word "apocalyptic" (see Narayan, and Chavez).

There is an undeniable apocalyptic content in news media coverage about climate change, and Nature is the villain who causes humanity to suffer. "Irma begins lashing Florida," cnn.com reads as I write this. It is a flat rejection of knowledge for responsibility that such news trumpets. We certainly have knowledge of the human hand in climate change (this is not the question), but news of weather disasters in particular and climate change narratives in general broadcast a obscuring (a concealing, muddling, and confusing) of agency. No longer indicted as the cause, the human is *non est reus*, freed of responsibility for the solution. Offered an epistemological alibi, humanity is relieved of its duty to the future, of its

obligation to answer for itself, and of its very capacity to process knowledge. Recognition of the causal relationship would lead to knowledge, a point Amitav Ghosh eloquently makes in *The Great Derangement: Climate Change and the Unthinkable*: "Recognition is famously a passage from ignorance to knowledge" (Ghosh, 2017: 4).

In a scathing exposé of how "poverty is ... an effect of the inequities created by the carbon economy[,] ... the result of systems that were set up by brute force to ensure that poor nations remained always at a disadvantage in terms of both wealth and power" (2017: 110), Ghosh maintains that "our lives and our choices are enframed in a pattern of history that seems to leave us nowhere to turn but toward our self-annihilation" (2017: 111). It is a careful policing of knowledge by industrialized nations (and use of such knowledge as a weapon) that produced this pattern of history, a history of industrialization that is premised on the perceived necessity for unequal development. Quoting Mahatma Ghandi's comment that should "India ... ever take to industrialism after the manner of the West ... , it would strip the world bare like locusts" (2017: 111), Ghosh goes on to explain "that the universalist premise of industrial civilization was a hoax; that a consumerist mode of existence, if adopted by a sufficient number of people, would quickly become unsustainable and would lead, literally, to the devouring of the planet" (2017: 112). For Ghosh, Ghandi's comment "goes to the heart of the matter: numbers" (2017: 111). From an environmental justice perspective, the implications are enormous. It is absolutely imperative to understand that Western knowledge production (and the industrial development such knowledge regimes produce) is unsustainable. And it is not simply, as Ghosh ably shows, the numbers that are the problem; rather, the problem is that entire epistemological framework services a mechanist, exploitative and extractive ethos characterized by an ideology of continual growth, limitless possibilities, and infinite resilience – all on a finite planet.

Complicating the matter even further is the fact that ecomedia has a tendency of omitting very important facts about our place in the world, knowledge of which is necessary if we are going to honestly address climate change. To come back to that tree in my front yard, we have to look at the simple fact that the genetics of life are not bound by the restrictions of knowledge: to be more clear, nature doesn't know and doesn't care about sustainability. For E.O. Wilson, "... genes hold culture

on a leash. The leash is very long, but inevitably values will be constrained in accordance with their effects on the human gene pool. The brain is a product of evolution. Human behavior – like the deepest capacities for emotional response which drive and guide it – is the circuitous technique by which human genetic material has been and will be kept intact. Morality has no other demonstrable ultimate function" (Wilson, 1978: 167). For Wilson, biophilia is the motive force directing humanity, and it is written in our genes. If we imagine a continuum on which biophilia sits, then we must also understand the ecophobia that is at the other end of the spectrum.

Ecophobia, like any other human behavior (including biophilia), is written into our genes. It cannot be otherwise, since there is no magical ventriloquism here, no enchanted space outside of our genes from which human behavior can reasonably be thought to originate. Yet, as Michael Beard, the voice of evolutionary compulsions in Ian McEwan's *Solar* notes, one must be wary when theorizing about genetics and culture. *Solar* nevertheless seriously questions the human capacity to make the behavioral changes needed to stop climate change, reflecting a larger debate that has been going on for a long time. For Wilson, "human emotional responses and the more general ethical practices based on them have been programmed to a substantial degree by natural selection over thousands of generations" (Wilson, 1978: 6). It would be difficult to refute such a position, and we know that we are compelled to certain behaviours by our genetic heritage.

On a business class flight circling over London, Beard himself wonders about the dangerous human impulses toward excess and its effects on global warming. He wonders, "how could we ever begin to restrain ourselves? We appeared, at this height, like a spreading lichen, a ravaging bloom of algae, a mold enveloping a soft fruit – we were such a wild success. Up there with the spores!" (McEwan, 2010: 127-128)[3]. It is reasonable to question the feasibility of halting or reversing climate change, given that human beings do what other species do: we grow *semper sursum*. Without natural predators or obstacles, any species will thrive to excess. We do not differ from other species in this. It is in the genetic nature of all living organisms to do so, a point Darwin himself makes: "There is no exception to the rule that every organic being naturally increases at so high a rate that if not destroyed, the earth would soon be covered by the progeny of a single pair" (McEwan, 2010: 54). It seems that moderation is indeed *not* a part of our genetic heritage.

Nature is not moderate. It is often characterized, Elizabeth Grosz explains, by "an invariable tendency to superabundance, excessiveness, the generation of large numbers of individuals, in the rates of reproduction and proliferation of individuals and species" (Grosz, 2008: 30). Nature revels not only superabundance, but in diversity, as Darwin also theorized: "more living beings can be supported on the same area the more they diverge in structure, habits, and constitution, of which we see proof by looking to the inhabitants of any small spot or to naturalized production" (Grosz, 2008: 105). The genetic drive toward producing abundance and diversity is an inescapable part of our material genetic heritage.

Surprisingly, of the more than 1.6 million hits on Google for "heritage and climate change," there is nothing on genetic heritage. Most of the hits have to do with heritage as it relates with commercial matters (such as tourism) and with the places and things (and, to a far lesser degree, practices) recognized by The United Nations Educational, Scientific and Cultural Organization (UNESCO) as being important or significant. The discussions tend toward abstractions, "cultural heritage" often unquestioned and undefined in any detailed sort of way. To address climate change narratives and their effects (or lack of effects) in terms of "heritage," however, requires a complicating of the term, an understanding of its varied branches – for instance, national heritage, natural heritage, food heritage, language heritage, industrial heritage, and so on.

Moreover, it is important to understand at the outset that while various types of heritage are under threat by climate change, so too is the preservation of heritage itself often a roadblock to effective mitigation of climate change roots. An ethical or environmentally-friendly eater, for instance, will have to tread carefully in discussing meat when it comes to questions of food heritage. Often, these questions are little more than a front justifying business as usual. Jonathan Safran Foer addresses these questions directly and poses some potential answers in a passage about American Thanksgiving well worth quoting at length here:

"And what would happen if there were no turkey? Would the tradition be broken, or injured, if instead of a bird we simply had the sweet potato casserole, homemade rolls, green beans with almonds, cranberry concoctions, yams, buttery mashed potatoes, pumpkin and pecan pies? Maybe we could add some Timucuan bean soup. It's not so hard to imagine it. See your loved ones around the table. Hear the sounds, smell the smells. There is no turkey. Is the holiday undermined? Is Thanksgiving no longer Thanksgiving?

Or would Thanksgiving be enhanced? Would the choice not to eat turkey be a more active way of celebrating how thankful we feel? Try to imagine the conversation that would take place. This is why our family celebrates this way. Would such a conversation feel disappointing or inspiring? Would fewer or more values be transmitted? Would the joy be lessened by the hunger to eat that particular animal? Imagine your family's Thanksgivings after you are gone, when the question is no longer 'Why don't we eat this?' but the more obvious one: 'Why did they ever?' Can the imagined gaze of future generations shame us, in Kafka's sense of the word, into remembering?" (Foer, 2009: 251)

Remembering the practices of the factory farm industry is important, but remembering our heritage and our cultural practices have, as Foer so eloquently explains, taken precedence. Foer candidly weighs heritage against ethics:

"How much do I value creating a socially comfortable situation, and how much do I value acting socially responsible? The relative importance of ethical eating and table fellowship will be different in different situations (declining my grandmother's chicken with carrots is different from passing on microwaved buffalo wings)." (Foer, 2009: 55)

Harold Fromm – one of the editors of the field-initiating *Ecocriticism Reader* – offers a very different take on this matter. For Fromm, fear of alienating potential friends trumps ethical eating. For Fromm, if you are a vegan, then "you don't care about being part of society or alienating potential friends who may find you more trouble than you're worth" (Fromm, 2010). Fromm's rant is premised on falsehoods, not knowledge or facts. Fromm believes that vegans "are enlisted in an open-ended but futile metaphysic of virtue and self-blamelessness that pretends to escape from the conditions of life itself" (Fromm, 2010). There are many people (vegans and non-vegans) who would object to this kind of characterization of what veganism is all about – at least judging from the 95 blog responses that were posted online. Fromm argues from very mistaken notions about veganism and vegans that "behind their beliefs is the hopeless longing for innocence" (Fromm, 2010).

Bloggers were quick to respond to Fromm's article. Few indeed had much good to say about Fromm's logic or ethics. Indeed, the very first blog response put it best: vegans, "robtempio" argues, seek "to minimize unnecessary suffering, insofar as is possible, by consuming a diet free of animal products. In a day and age where alternatives to a diet based on

animal products is [*sic*] increasingly available and possible, what's wrong with that?" Indeed, what is wrong with that?

Despite Fromm's rhetoric, the meat industry is a climate change disaster, and this is very well documented. There is enormous waste and inefficiency in meat, milk, and egg production in terms of the energy input to protein output ratio, compared with the energy required to produce protein directly from vegetables. There is also an enormous and similarly well-documented waste of water in such processes. The impact of meat on climate change, however, has only recently caught the attention of the UN, which has singled out beef production as a key contributor to greenhouse gases. CNN has run stories about "Why Beef is the New SUV" (Sutter, 2015), about "How to reduce your cancer risk and help the environment: Eat less red meat" (Nestle, 2015), and asking "Ditch meat to fight climate change?" (Mounk, 2015). The reason for this interest in the meat industry is that cows produce enormous amounts of methane, a greenhouse gas more than 20 times worse for climate change than CO_2. There is indeed a growing consensus that a vegetarian (or, better yet, a vegan) diet is good for the environment ("Eat less meat", 2008).

Producing and relaying knowledge about climate change must be based in facts, not the kinds of fictions Fromm bandies about, and we must wonder why would such a well-respected scholar as Fromm would feel compelled to abandon knowledge and reason as far as to argue that because "we must have been eating our mother during gestation" (a false and unscientific[4] understanding of what goes on inside the womb), we must, therefore, be carnivorous outside of the womb!

Part of the answer must lie in the fact that there is an increasing public awareness about climate change and its causes, and with this is an increasing pressure for people to change their attitudes and behaviors. Heritage cannot be an excuse for continued derogation of the environment; even so, what we put into our bodies is a deeply personal matter. The problem is that it is not only personal: it affects the world. It affects climate, and climate is a difficult concept to grasp.

Weather is something that humans generally remember; climate is a different matter. Describing the weather patterns of a generation (30 years), climate is on an entirely different and much longer scale than weather, and the result is that the fluctuations of climate register in our minds less readily than do the more immediate daily fluctuations of

weather. Memory, after all, is never about accuracy of events, of proportionality, or of objective data-minding[5]. It is about the significance of events to our lives. We remember our childhoods from the significant events that we experienced – the serious bicycle fall in '69 on the rough sidewalk on 22nd Avenue; the sunburn at Lake Harrison in '76; spit-balling the English Lit teacher in grade 9 and getting expelled for a week. We remember climate in the same way: by the significant events that mark out its history in our lives. If imagining climate means piecing together recollections of weather events, rather than remembering an accurate linear stream of weather events of equal significance and conceptual size, then what are the implications of this, what Mike Hulme calls a "dislocation of ... weathered memories" (Hulme, 2012: 161), and of how we deal with the linear trajectories of climate change?

For Hulme, the very process of our memory-making "unsettles our expectations about the future. It begins to unsettle our belief that we know how the weather of the future should be" (Hulme, 2012: 161). Hulme goes on to suggest that "the threat of climate change arises more from a scrambling of our memories – and a subsequent disorientation of our expectations of the future – than from any *diminution or destruction of a material resource*" (2012: 161, *emphasis* added). While the notion of disorientation is a reasonable and valid interpretation of the affect of climate change, it seems also reasonable to suggest that far from scrambling our memories, climate change vigorously reasserts the soundness and integrity of our memories, and, indeed, therein lay the threat. Moreover, to *downplay* the threat of the "diminution or destruction of a material resource" as Hulme does seems to announce a very privileged position of insularity and distance from the stark materiality of climate change that is becoming increasingly present in the Global South and relatively unindustrialized areas.

Hulme's complex understandings of climate offer sometimes valuable inroads for understanding how to move forward[6]. He maintains, for instance, that climate is "a continuously re-invented idea in which imagination, place, culture and history engage with the physicality of heat, cold, wind, sun and rain" (Hulme, 2012: 19). He also claims that "idea of climate therefore becomes an ineffable multi-sensory account of my past" (2012: 161). But we can't have it both ways, and I am more inclined to side with Timothy Morton that "we *can* speak ineffable things. When we say we can't speak the ineffable, there we are, speaking

it" (2012: 112). Climate change is big, is not weather fluctuations, is part of that big body of things that fall under the rubric that Rob Nixon calls "slow violence," but this does not mean that we cannot talk about it – indeed, we have talked, do talk, and will talk about climate change.

Reflecting an increasing public awareness of radical weather events, of an increasing degradation of ecosystems, and of an accelerated mining of the Earth's non-renewable energy sources, "Climate Change Fiction" – what has come to be known as Cli-Fi, a term coined by freelance journalist Dan Bloom (Glass, 2013) – and climate change narratives in mainstream media have each flourished. Documentaries about environmental crises abound, and news about global air quality and about species extinctions have become the norm. It behooves us, therefore, to speculate as to why we seem unable to make the changes necessary to save ourselves, why, indeed, we are accelerating rather than slowing our destructive practices. How is it possible that both increased awareness among lay people and a radical exposure of environmental issues in media can be present at the very moment in history when there are what seem to be exponential increases in assaults on the environment? Partial answers, as this article has shown, lie in the ways that climate itself as a concept disrupts our capacity to make knowledge (both because of the affect and the unthinkability – to borrow from Ghosh's subtitle – of climate itself) and to imagine the involvement in climate change of our cherished past, the plural heritages that define both our biological and cultural existences. There can be little doubt that "Climate change poses a major threat to cultural heritage ... [that f]ailure to respond with adequate strategies to deal with climate change means that more and more irreplaceable cultural heritage will be lost ... [and that t]his will be compounded by the disappearance of material heritage and the intangible dimensions with which it is interwoven" (Hall *et al.*, 2016: 19). But there is another side to this topic – namely, that how we envision culture and heritage themselves is a problem. Ghosh argues convincingly that "Culture generates desires – for vehicles and appliances, for certain kinds of gardens and dwellings – that are among the principal drivers of the carbon economy" (Ghosh, 2017: 9-10). The problem, Ghosh notes, is "that the patterns of life that modernity engenders can only be practiced by a small minority of the world's population ... every family in the world cannot have two cars, a washing machine, and refrigerator – not because of technical or economic limitations but because humanity would

asphyxiate in the process" (2017: 92). It is not only humanity; the entire planet is asphyxiating. Climate change narratives are our paroxysms of breathless desperation – and hope.

Reflecting a complex interplay of issues involved with heritage, knowledge, and memory, one important implication of climate change narratives is that humanity urgently needs to reassess its value systems and ethics: heritage can no longer be an excuse for continued derogation of the environment. To face this complex and controversial issue will require tremendous care with facts and a rejection of the trend (as revealed by the Trump Administration) toward tacit acceptance of "alternative facts,"[7] otherwise known as *lies*. It will require a rejection of the forgetting that seems increasingly to characterize global media. It will require effort – to remember, to find and disseminate knowledge, and to understand our place on the planet. Our very existence depends on how we revision heritage, knowledge, and memory, and we are running out of time.

Notes

[1] In this article, I do not respond to claims of deniers, since to engage with such people lends them far more authority than they deserve. When Scott Pruitt, the Head of the US Environmental Protection Agency (EPA), claims that CO_2 is not the primary engine of climate change. We cannot disavow ourselves from our role in climate change: to do so would be to deny the validity of the facts, to refuse to acknowledge the scientifically proven centrality of the human as the primary agent of our climate change, to evade responsibility, to join ranks with the Donald Trumps, the Scott Pruitts, the Tom Coburns, the Exxon-Mobils, the Koch Family Foundations, and all of the other climate change skeptics and deniers, and to put our heads in the sand.

[2] We know that anaerobic bacteria caused mass extinction. What has come to be known as the Great Oxygenation Event (see Torres, Saucedo-Vázquez, and Kroneck, 2015) resulted in a radical refashioning of the biosphere, one that resulted in mass extinctions. As Phil Plait explains, "[m]ost of the bacteria thriving on Earth were anaerobic, literally metabolizing their food without oxygen. [...] To the other bacteria living in the ocean – anaerobic bacteria, remember – oxygen was toxic. [...] A die-off began, a mass extinction killing countless species of bacteria." It is no exaggeration for Plait to say that "this event was monumental, an apocalypse that was literally global in scale, and one of the most deadly disasters in Earth's history." (Plait, 2014)

[3] Adam Trexler observes that Michael Beard's relationships and behaviors "are overdetermined by an evolutionary drive to compete and dominate against members

of the same species" (Texler, 2015: 48). Beard's character embodies excessive appetites, and in the novel, his character compulsively seeks to satisfy them.

[4] As Greta Gaard has commented, Fromm's "failure to understand the sciences speaks volumes – really, what is his qualification to publish his rant on veganism? Is he a member of the American Dietetic Association? A biologist? He has no credentials to speak on this topic – and Americans fall for it every time, like Jesse Ventura (the wrestler) getting elected as Governor of Minnesota or Ronald Reagan as President of U.S." (Gaard, 2010). We might add Donald Trump to that list now.

[5] This is rather similar to the notion Michel Serres has about time being less a flow than a percolation. Serres argues as follows: "Far from flowing in laminar and continuous lines, like a well-behaved river under a bridge, upstream to downstream, time descends, turns back on itself, stops, starts, bifurcates ten times, divides and blends, caught up in whirlpools and counter-currents, hesitant, aleatory, uncertain and fluctuating, multiplied into a thousand beds like the Yukon river. Sometimes time passes, sometimes not; but when it passes, it does so as if through a colander... and this filter or percolator supplies the best model for the flow of time." (Serres, 1997: 15)]

[6] While complex, however, Hulme's understandings of climate and climate change are not entirely accurate. There are very few people, for instance, who would agree with his claim that "climate change is not the result of the pollution or destruction of a physical space" (Hulme, 2016: 161). Anthropogenic climate change is *clearly* the result of the pollution of the atmosphere (specifically with greenhouse gases such as carbon dioxide and methane) and with the destruction of physical spaces (such as carbon sequestering forests and light –reflecting ice-sheets).

[7] The term came from U.S. Counselor to the President Kellyanne Conway in 2017 as she defended the Press Secretary Sean Spicer, who had made comments that were untrue.

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