

Title: On the Eve of 2050: The body, the psyche, the Anthropocene  
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The health, economic, political, and environmental implications of climate change affect all of us. The tolls on our mental health are far reaching. They induce stress, depression, and anxiety; strain social and community relationships; and have been linked to increases in aggression, violence, and crime. Children and communities with few resources to deal with the impacts of climate change are those most impacted. To compound the issue, the psychological responses to climate change, such as conflict avoidance, fatalism, fear, helplessness, and resignation are growing.

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In the first few decades of the 21st century, the pressures of the Anthropocene are only just beginning to be felt, in recurring droughts, floods, extreme weather events, and other climate disasters. The potentially apocalyptic nature of the environment in coming decades remains at a distance for many of us, its impacts not necessarily apparent, especially for those of us lucky enough to live in places relatively insulated from its more deadly effects. Instead, we are left estranged in the face of the complex spatial and temporal systems that make up climate change, even when we put tremendous effort into creating ways for representing them: graphs, statistics, manifestos, treaties and trade agreements, news coverage, and so on. The scale of the Anthropocene's impacts, temporal and spatial, render such techniques woefully inadequate in helping us to map ourselves within this new epoch.

Without the ability to cognitively place ourselves within these changing global systems, we are left with little agency or motivation to make any necessary changes to mitigate climate change. The changing environment becomes a story that is either too big, breeding fatality and impotence, or so small that it seems not to matter. Psychologists have coined the term “psychological distance” to describe such a relationship to events that appear “temporally, socially, and geographically removed from our everyday experience,”<sup>1</sup> as they do for those yet to experience any climate events directly. Even for that privileged group, however, the knowledge of coming environmental disaster can have indirect psychological and psychosocial impacts, as a recently updated report from the American Psychological Association makes clear.<sup>2</sup> What physical and psychological effects, then, will climate change and attendant eco-anxieties and solastalgia<sup>3</sup> have on those living in 2050? What follows is a thought experiment, in which we imagine Eve as a Canadian woman, born in Edmonton in 2017; we want to suggest ways that global warming, increasing severe weather events, mass extinctions, sea-level rise, forced environmental migration, and the other Horsemen of the Anthropocene might impact Eve as she develops, physically and psychically.

Eve will come of age in the Anthropocene: a geological and conceptual epoch that marks humanity's impact on Earth at a global scale as seen through climate change, loss of biodiversity, and the acidification of the oceans, to name a few coming changes. As a child, teen, and young adult, Eve is relatively plastic in her biology and neurology, as well as in her sociocultural expectations of the world around her. Her body and brain will adapt to the world within which she develops. Stressors will trigger endocrine responses and well as neurophysiological and

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<sup>1</sup> McDonald, RI, Chai, HY, & Newall, BR. (December 2015). 110.

<sup>2</sup> Clayton, S., Manning, C. M., Krygsman, K., & Speiser, M. (2017).

<sup>3</sup> Coined by Glenn Albrecht in 2005, solastalgia refers to “the ‘lived experience’ of the loss of the present as manifest in a feeling of dislocation; of being undermined by forces that destroy the potential for solace to be derived from the present.” See Albrecht, G. (2005) and Albrecht, G. et al. (2007).

neurochemical changes to better mediate herself from the external world. She is rich in possibilities, and her body will fine-tune itself in relation to the textured nuances of her lived experience.

As she grows, however, so will the acceleration of Anthropocene effects. Natural disaster occurrences previously considered once in a lifetime events will increase in severity and regularity. Incidences of bacterial diseases such as salmonella and cholera will increase, and zoonotic diseases like Lyme disease and malaria will likely become more common as the range of their carriers (ticks and mosquitos) grows wider.<sup>4</sup> And with these changes, the potential effects on Eve, no matter how privileged a position she has, will increase. She will, without a doubt, face at least one natural disaster in her lifetime: flood, forest fire, hurricane, drought, dangerous temperature extremes.... Should she somehow avoid this, it will be impossible for her to avoid the signs of disasters happening in other places, through the connections of a globalized, technologized mediascape. Even beyond any specific disasters, the Anthropocene will be a period of uncertainty and lack of control over the world in which Eve dwells, conditions potentially leading to greater likelihoods of individual depression and anxiety, along with a broader cultural malaise of fatalism, helplessness, and fear.<sup>5</sup>

In 2037, Eve will be entering her 20s, an age when the brain goes through its final stages of development and episodic or life-long mental illnesses often emerge. Eve spent her childhood in the Anthropocene. Her exposure to adverse childhood experiences will increase the likelihood of her developing physical and mental illness. Her body has tried to adapt for her environment, but adaptation is not always positive; there are serious potential side effects to this eco-sickness. These eco-events and their immediate, social, and family implications, could lead to varying degrees of attachment disorders in children. Relationships, primarily with a primary caregiver, play a crucial role in the stable development of a child's emotional capabilities. A caregiver helps mediate the experience between the child and its environment, creating, hopefully, a safe and stable space in which to thrive.<sup>6</sup> However, there is also the development of direct attachment to the environment itself and the child. As a child of the Anthropocene, Eve's relationship to the environment is likely to be unstable, if not chaotic and traumatic, creating the potential for a disorganized attachment between the two. The imprints of these unstable and disorganized relationships will be written into her neuroendocrine system, limbic system, and areas of her frontal cortex. These psychological and physical effects will demand new coping mechanisms, and may lead to new psychic and psychosocial disorders; they also hold out the potential for increased resiliency if she is to flourish as an adult.

By 2050, Eve have entered her thirties, and may have children of her own. By this point her neurodevelopment, for good or ill, will be complete, and most forms of mental illness that she might face will have manifested. She will likely have undergone some form of medical intervention; she will certainly have experienced or witnessed a natural disaster, along with a string of ever-increasing average yearly temperatures (which will have risen between 1-3 degrees Celsius from those in the first decade of the 21st century<sup>7</sup>), and have seen between 15-37% of species becoming extinct or "committed to extinction."<sup>8</sup> These changes, along with their psychosocial, economic, and political effects, will have left their mark on Eve, in her

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<sup>4</sup> McMichael, A.J. and Lindgren, E. (2011). 408-9.

<sup>5</sup> Johnson, J. H., & Sarason, I. G. (1978).

<sup>6</sup> Cassidy, J., & Shaver, P. R. (1999).

<sup>7</sup> IPCC. (2014a). 57.

<sup>8</sup> Thomas, C.D., et al. (2004). 145.

neurobiology, her psychology, and even her genes. The stresses of her environment, and her increased risk of exposure to environmental toxins, will likely have caused epigenetic changes in her gene expression, activating some while silencing others, with potentially adaptive and maladaptive effects, which can be passed along to any children she may have.<sup>9</sup>

Eve, and her possible descendents, will face any number of physical, psychological, and social challenges; from an evolutionary standpoint, Eve developed to thrive in the relative stability of the Holocene, not the more extreme and unstable Anthropocene environment. What factors will allow her to survive the coming changes, and perhaps even thrive? Certainly technological developments may offer some hope, but perhaps even more importantly for her psychosocial flourishing will be her capacity, and that of her community, for resilience: the ability to positively adapt one's self and one's community to the challenges of extreme adversity. Resiliency can be bolstered by a variety of intrinsic and extrinsic factors, including an individual's optimism, self-belief, and openness to change/adaptation; developing individual self-regulation and active coping strategies; strengthening social support networks and community engagement; developing new narratives for and new expectations of changing situations; and preparing, both individually and communally, for potential disasters and other forms of adversity.<sup>10</sup> Resilient individuals are more likely to endure the various effects of the Anthropocene, and in some cases, even flourish; facing the challenges of the Anthropocene, Eve could experience post-traumatic growth, an increased capacity, psychosocial maturation, and confidence gained through overcoming adversity, grieving one's losses, and moving on towards an uncertain future.<sup>11</sup>

There is no single solution to the problem of climate change and living in the Anthropocene: the problems Eve will face are inescapable. But, should she meet the challenges of a changed environment and society and learn to live with the Anthropocene, she may grow and adapt in ways that allow for new social experiments, ones more resilient, sustainable, and psychosocially adaptive than those that created the world of 2050.

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<sup>9</sup> Guerrero-Bosagna, C. and Jensen, P. (2015).

<sup>10</sup> Clayton, S., Manning, C. M., Krygsman, K., & Speiser, M. (2017). 42-4.

<sup>11</sup> Clayton, S., Manning, C. M., Krygsman, K., & Speiser, M. (2017). 36, 42, 69.

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