Fahrenheit 451*

By Bahareh Behroozi Asl

After arriving to Canada in the summer, I was eager to experience the harsh winter conditions. It was not that I enjoyed extreme weather, but rather I had been bombarded with questions, such as: "Have you ever experienced winter here?" or "Are you prepared for it?" Regardless of my answers, I was guaranteed to be shocked and not prepared enough. Having experienced my first winter, I was convinced that I was now capable of answering all those questions; it would be a simple "Yes! I have lived through the winter, and I know how to deal with it". Ironically, I have engaged in these inquiries lately, asking newcomers their views on winter and sometimes taking it so far as to ask Canadians who have lived here for generations if they are accustomed to it yet.

Opening conversations with remarks about the weather is an important part of small talk. It is inevitable to envision taking an elevator ride with a neighbor who appears "familiar" without talking about the weather. Do we really consider the weather's importance in our lives as much as we talk about it? Apart from help in making conversations and planning vacations, important decisions in life are grounded in weather considerations such as where we want to live and our plans for retirement. Since it impacts our life at so many levels, it makes me wonder why we do not pay attention to climate change warnings.

Even though this is not an easy question to answer, the most basic answer is the difference between the definition of "weather" and "climate". Climate is the average weather of an area over a long period of time, whereas weather is the short-term conditions of a region. It is true that we wish for weather changes, and we experience its impact on our daily routines and decisions, whereas climate change will take time to affect all our lives directly and may not be as apparent as weather changes. This may explain why we don't want to consider how our daily decisions - or our inaction - can affect the weather in the short and long term. We are wired from an evolutionary standpoint to respond as quickly as possible to any external adversary, especially if it threatens our survival. What can explain our indifference to climate change?

When it comes to climate change, there is no enemy outside of ourselves. Psychologically, human beings attempt to ignore the existence of delayed-effect events. Besides, modern humans may not consider climate change as a threat because they are overloaded with other stressors. Many have even questioned its existence! We are reluctant to give up our comfort and habits for some uncertain, distant, collective loss in the future. These are among the many reasons why people do not take global warming seriously.[1]

In an interview, aired on the "Hidden Brain" podcast, George Marshall, director of Projects at Climate Outreach and author of " Don't Even Think About It: Why Our Brains Are Wired to Ignore Climate Change" used an anecdote from the Nobel prize winning economist Thomas Schelling to explain our behavior toward climate change.[2] You are stuck in traffic, and you spend a great deal of time wondering what the cause may be. Finally, as you approach the end of the traffic, you see a mattress lying in the middle of the highway causing the traffic jam. Most people, if not all, are more likely to simply drive past as they have expended a great deal of time and energy in the traffic and besides, removing the mattress will not be of any direct benefit to them. This simple anecdote explains why we are reluctant to consider climate change and its effects; we believe that its worst effects will not have a direct impact on our lives.

We can consider the human role in climate change; however, one should not forget that we are also the

product of it in some way. Not long ago, a meteorite the size of Manhattan struck the Yucatan Peninsula in what is now Mexico.[3] This event led to the extinction of dinosaurs and other giant species from the planet and paved the way for mammals to diversify. Such drastic changes wiped out entire species at once. Between 50 and 90 percent of all species perished during each of the five mass extinctions recorded in Earth's fossil record during the past 540 million years, and this was followed by the emergence of new, very different species.[3] Climate change and evolution were also linked in Charles Darwin's famous work, "The Origin of Species". As the climate changed, so did the availability of food, shelter, and other resources. Further, the species (as well as the genes they carried), that could adapt to those changing conditions, survived, and increased in number.

It is possible that what I discussed was an argument used by those who do not believe in global warming to justify their decision to not worry about the future since it is a natural cycle. According to NASA, there is a difference between "global warming" and "climate change".[4] Climate change is a natural phenomenon, but global warming is a result of human activity: "Changes observed in Earth's climate since the early 20th century are mainly driven by human activities, especially fossil fuel burning, which increases greenhouse gas levels in the atmosphere and raises Earth's average surface temperature. Human-produced temperature increases are referred to as global warming".[4] Basically, all those phenomena that occurred during millions of years of evolution constitute "climate change," but "global warming" is caused by humans, so I would not have gone too far as to suggest that humans are responsible for these effects.

All living organisms on Earth can combat global warming in different ways.[5] Dispersal and settlement in a more adaptable habitat is possible for many species. To achieve this, various mechanisms can be employed, including epigenetics, which is the effect of environmental factors on gene expression. These mechanisms help organisms adapt to new environments by giving them phenotypic and environmental plasticity. While genetic changes are rare, the environment also influences genetic codes over time during evolution.[5] It is essential for all organisms to be able to sense and adapt to new environments, but for plants and microorganisms it is even more crucial since their sessile lifestyle exposes them to the environment. Thus, the hemostatic system helps them to balance stress under extreme conditions with growth.[6]

Here, the question is how far an organism can "stretch" in order to adapt to a new environment. An analogy may be helpful here. Consider an enzyme that catalyzes an interaction. It is well known that enzymes function best in an optimal environment. However, under less ideal conditions, the enzyme may still be able to function. Certain conditions, such as extreme temperatures, can result in the enzyme becoming inactive. This also applies to other types of organisms. An organism performs optimally under certain conditions, and beyond these thresholds, its tolerance is limited. This is the tolerance threshold. Using this concept, it is possible to identify which species are threatened by climate change.

In the case of humans, the adaptation scenario is a bit more complex. Humans have developed ingenious technologies, sophisticated languages, and complex institutions to pass on the knowledge and skills they have gained over time to the next generation. In his book, Joe Henrich illustrates how genetics and biology are inextricably linked with cultural evolution, and how culture-gene interactions led our species to embark on a remarkable evolutionary course.[7] In an example based on a simplified explanation, we can alter our immediate environment or even fake the traits that make us more suited to our environment, rather than merely possessing the genes that make us adapt to it. Having lived all my life in mild four-season weather, I was not required to adapt to extreme cold weather conditions upon immigration. During the cold season all I needed to do was to find the best price and I could go to the mall or even order online all the amenities that kept me warm. People no longer even need thick coats because of remote start, pedways, insulated homes, and warm cars. Cultural evolution, as well as other evolutionary processes that have co-evolved with genetic evolution, provides us with a new understanding of adaptation.

Artificial adaptations were also used to cope with global warming at other levels. As a result of our actions, the effects we have already had on the environment cannot be undone, and we must deal with them as a result. New advanced strategies are being developed to cope with the new climate. These strategies include accepting the detrimental effects of climate change, including the rising sea level, and considering urban environmental planning like the creation of islands, shoreline armoring and seawalls.[8]

Are we to be less concerned about global warming since we can be sure that our brilliant collective minds will figure it out?

Not at all!

The first thing to remember is that Earth's habitats are not confined within our fancy cultural evolution! We are part of the natural ecosystem. The natural environment affects us directly. Importantly, we may have been thinking about strategies to adapt physically to the rapid changes happening around us, however are we mentally sound? What impact has global warming had on us?

Despite all urban planning and consideration, extreme weather has caused a variety of natural disasters (flooding, hurricanes, rising ocean temperatures, ice loss at the poles and in mountain glaciers, heatwaves, and fires, to name a few). For example, in 2021, 1,600 fires burned nearly 8,700 square kilometers in Canada. The Insurance Bureau of Canada estimates the insured damage caused by 2021 November flooding in British Columbia are at $450 million.[9] In addition to such financial burden numerous studies have examined the impact of natural disasters on human mental health later in life. Several recent studies conducted by researchers from the University of Alberta demonstrated the negative effects of the Fort McMurray Wildfire 2016 on youth mental health, particularly for those who were directly affected.[10]

Another important point to consider is that climate change has different effects on different sectors of society. Several social groups, such as indigenous people, women, minorities, low-income people, rural communities, and new Canadians are more vulnerable to climate change, according to the Natural Resources Canada's Regional Perspectives report.[11] In the case of indigenous people, it is important to consider the fact that their culture and language is embedded in their surrounding natural world. Their calendar months, for instance, are based on descriptions of animals and migrations. This lost connection reminds me of the term "eco-grief", which can be described as "the mourning of the loss of ecosystems, landscapes, species and ways of life is likely to become a more frequent experience around the world".[12]

Global warming may have different effects on us depending on where we live and how connected we are to nature. But its deleterious effects are also as intangible and silent as itself and are right at our fingertips. Perhaps, we should slow down, park our car safely and go remove the mattress from the highway. It may not help us get home earlier, but in the long run, it will benefit all of us.

*This is the name of a novel by American author Ray Bradbury. In his book he depicted a horror future in which people burn all the books due to ignorance. I used this title to show that ignoring climate change is like ignoring science! And it is a high temperature which can be somehow associated with the concept of climate change!

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