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Camouflaged

Living Lexicon

I begrudgingly open my Pearson Biology textbook to Chapter 22.3, the "Process of Evolution." I sigh and begin scanning through the section. As I read, I come across the modern-day textbook example of evolution in action — the peppered moth. The peppered moth is a species of moth found in Britain whose phenotype has been greatly impacted by the waxing and waning of pollutants in England. The Industrial Revolution, the transition to larger scale manufacturing during the late 1800s, was one of the first major sources of pollution and change in the environment. This was due to the use of coal, which caused soot to land on many trees and homes. Lichen trees, covered in ashes, transitioned from a pure white to a coal black. Therefore, the white moths were unable to blend into the lichen trees so they were eaten by predators, and the darker colored moth populations increased (Biological Science). Once an untouched white, the moth population's wings transitioned to a spotted black color with little white to be found. As of recently, Great Britain has been working towards improving their regulations on pollution production so the white spotted moth population has slowly begun to increase. However, I note that the peppered moth's recovery is unique because usually when the environment shifts, humans do little to slow down the changing climate. I finish my biology reading and shut my book.

I look out the window in front of me. Branches brush up against the glass and I trace the fingers of the tree back to a bird's nest carefully cradled in the hands of it. The nest blends in with the branches making it almost invisible to the unobservant eye. The secrecy of the nest protects the fledglings from hungry predators and allows them to grow to adulthood. I realize that the nest outside my window is the same as the peppered moths that I had read about in the pages of my biology textbook. Both use *camouflage* as a way to preserve and protect life.

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According to the *Oxford English Dictionary*, Camouflage is "the natural disguise or concealment of an animal (or its nest or eggs) from predators or prey brought about by coloration, markings, features of shape or behaviour, etc., that makes it difficult to distinguish from its surroundings" (Oxford English Dictionary). Effective camouflage is an essential adaptation to increase an organism's fitness, ability to reach sexual maturity and reproduce viable offspring, now more than ever before (Biological Sciences).

The most consequential obstacle all organisms on Earth face is climate change. Growing up, I observed global warming on a personal level. When I was an early elementary schooler, I would peek out my bedroom window every winter day anticipating a familiar, pure white blanket of snow covering the ground. At least one or two days a week, the blanket would be present and a delay or snow-day would be called. Yet, when I reached high school, my burning anticipation for snow days melted away as I observed my Pennsylvanian winters become cold and rainy rather than snow covered. Unfortunately, my situation is common. Many animals living in snowy biomes also face the same struggle of having decreased snow falls and increased temperatures.

White snow hares depend on an abundance of snowfall so that they can utilize their white coats to camouflage; however, with decreased snow coverage, snow hares are no longer able to blend into their once pure white home. According to a study done by Mills from the American Association for the Advancement of Science, survival cost due to camouflage mismatch is a direct index of fitness. From this study, Mills has found that snow hares who had camouflage mismatch had an eight-five to one hundred percent mortality in predation related to the coat color molt phenology. Although the white snow hare population has decreased, the snow hare population will not disappear due to the presence of the brown phenotype present in some snow hares. Therefore, the population of snow hares will adapt to the decreased snowfall caused from climate change. Zimova, a researcher at the School for Environment and Sustainability at University of Michigan, writes, "In the absence of adaptive response, we show that these mortality costs would result in strong population-level declines by the end of the century" (High Fitness Costs of Climate Change-induced Camouflage Mismatch).

In order to survive our planet's ever changing climate, organisms must adapt like the peppered moth or the snow hare. Species must constantly develop new forms of camouflage to match their fluctuating climate which is caused by negative human interactions. Mills supports this statement writing,

> "Maintenance of biodiversity in a rapidly changing climate will depend on the efficacy of evolutionary rescue, whereby population declines due to abrupt environmental change are reversed by shifts in genetically driven adaptive traits" (Winter Color Polymorphisms identify Global Hot Spots for Evolutionary Rescue from Climate Change).

However, it is impossible for all species to survive climate change. The Millennium Ecosystem Assessment estimates that extinction rates are rising 1000 percent above natural rates and every day about 150 species are lost. The rate of extinction of species now, due to human

interactions, is even higher than the rate of extinction of dinosaurs. So, the question is, why is the entire world not concerned with loss of species? *Camouflage*.

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The second *Oxford English Dictionary* definition of camouflage is "Disguise, concealment; (now) *esp.* A means of, or the action of, misleading someone or disguising from the truth" (Oxford English Dictionary). The truth about the impacts of climate change is camouflaged beneath decade long campaigns, contrasting political statements, and big oil companies. Clashing information from many sources makes science a less trustworthy source of information for many people. As a result, many choose not to participate in environmentally friendly practices. Additionally, developed countries, like the United States, are better equipped to deal with climate instability than less developed. Therefore, these developed countries are less likely to create policies that protect the environment because natural disasters, rising sea levels, and increasing temperatures caused by climate change are perceived as a lesser threat. A combination between the people's distrust and the country's false sense of safety allows climate change to be easily camouflaged by those who believe environmentally friendly practices are "bad business."

The root of our camouflaging stems from ignorance and selfishness. We refuse to take measures that add stability into our climate because it will be costly for big companies and an inconvenience for the average Joe. Therefore, we camouflage the climate crisis. Our camouflage are the lies that we tell about the "true" state of the environment and the incorrect idea that climate change is a minor problem that can be solved on a "later date." Our camouflage only ends in the destruction of species. In contrast, I remember the bird's nest I saw cradled in the tree — its camouflage was protecting and preserving life.

I recall the snowy hare who struggles to survive the changing climate but may survive due to the presence of a darker coat to match its newly snowless home. I reflect back on the peppered moth that sparked my interest in *camouflage*. I remember that human destruction soiled its pure, untouched wings. However, a few flecks of white remained on its blackened wings ready for when we humans decide to remove our camouflage jackets that cover the bloody wounds we have made on our body, our earth.

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