Noticing Tiny Things

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Breaking the Ice: Women, Science, and Antarctica,Series

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I have always been drawn to the environment and to understanding how living things work. My parents are both plant molecular biologists, and I had a limited understanding and familiarity of DNA and photosynthesis long before it was taught to me at school. I would breathe on plants to give them carbon dioxide in the school yard, although I can't seem to remember what my friends thought of this at the time. I have always loved having pets and attempting to make friends with wildlife, be it snails or butterflies. I learned to be quiet when observing birds, would make a special effort to avoid stepping on ants, and learned to capture spiders and release them outside (not without some apprehension). I was delighted when my grandad, a heather expert in his free time, named a novel species after me, and when I got to play around with pipettes in my mum's lab while she worked. My brother and I imagined that we were combining penguin and dinosaur DNA to make wonderful new creatures. Little did I know that I would meet exotic penguins once I moved to Western Australia, where the smallest penguins in the world live, and then again on the frozen continent itself.

My love of flora and fauna and of their inner workings led me surely and steadily towards studying biology. My university studies started off very generic. As I had so many interests, I struggled to narrow my focus. Eventually, I majored in genetics and microbiology—studying the small to understand and solve large problems. Indeed, DNA is at the source of inner biological workings and the key to understanding what makes living things "tick." Bacteria have short generations and hence evolve quickly, solving complex issues in basic ways. I am drawn to learning from natural systems that have solved problems over evolutionary time. When looking for a research project to pursue during my higher studies, I looked for a topic where I could apply my DNA and bacterial knowledge and that tackled environmental issues, rather than the more commonly studied medical field. This led to me working with a social insect group on a topic no one specialized in at the time: the gut bacteria of termites and their link to biofuel optimization. Again, the idea here was to improve a human idea by learning from the diverse termite gut community, which has adapted to breaking down different plant types in efficient and synergistic ways. Over the next few years, I honed my DNA extraction, sequencing, and analysis skills, as well as my knowledge of termites and the Western Australian bushland.

With my background in mind, you can imagine my reaction when I explored the Antarctic Peninsula, as part of a leadership program for women in science. I felt lost, as my existing biological knowledge struggled to name and understand what I saw around me. The lack of trees and creepy crawlies, in particular, made many locations appear barren to me. Without access to a microscope, I had no idea how much bacteria were around me, how active they were, or what roles they might have been playing. My biggest connection was to the penguins as the most visible, smelliest, and loudest organisms around. They looked so awkward on land where they stumbled and tripped, but covered large distances, waddling their way up to their rocky nests, perched up and away from the snow. Their struggles resonated with me, as I worked through the ups and downs of my PhD and found my place in life. Porpoising through the water into the distance, they finally seemed to be comfortable and have found their "calling."

What Antarctica lacked in diversity of flora and fauna it more than made up for in sheer scale. Where there were penguins, there were thousands of them, even tens of thousands in some cases. It was hard to comprehend how so many animals could cohabit in such close proximity with so little fear of predators. It makes them curious rather than fearful. If you remain still and relatively quiet, they will come right up to you to investigate. It felt ever so special to have a chinstrap penguin have a gentle nibble at my jacket, although a little wrong. I am used to being feared and avoided by wild animals, or fearing them. In fact, I learned their predators typically hunt them in the ocean, where both are fast and graceful. On land, penguins are defenceless, but adults are very rarely targeted. We saw large birds called skuas, which often hunt in pairs, aiming to distract parents and target either the penguin eggs or the young.

We did see a rare occurrence of a skua targeting and killing an adult chinstrap penguin on land. It was absolutely surreal to watch all the other penguins go about their business, seemingly oblivious to the violent display. These predator-prey interactions and the remnants of stolen eggs were reminders that we were witnessing raw, uncut nature at play. Another reminder was the presence of penguin bodies at various stages of decomposition. They were relatively rare considering how many penguins we saw, but eye opening to see them in the proximity of mating displays and nests where eggs or freshly hatched penguins were being warmed by their parents.

The scale also extended to the scenery. Going against my scientific training, I did very little research before traveling to Antarctica. It was not somewhere I had ever thought I would go, and my knowledge of the seventh continent was very limited. I chose not to look too much into it before heading over for two reasons, although I'm not sure which was more important at the time. Firstly, I wanted to be surprised by the magic of the place, and I thought the effect would be stronger if I hadn't read too much in advance. Additionally, I was quite nervous about crossing the Drake Passage after seeing a couple of video snippets of the aptly nicknamed Drake Shake. And what about crevasses and leopard seals? Part of me did not want to be too informed so as not to be able to ask myself too many questions, but rather get onboard for what was going to be a life-changing experience.

If you asked me what I pictured when I thought of Antarctica, I would have answered penguins on ice. And absolutely, I saw penguins on ice. But that image does so little to represent the diversity of sceneries we saw. What was common to these diverse landscapes was their epic scale. The mountains! I had no idea just how many peaks we would come across, with their dark, rocky formations contrasting with the snow and ice. They constantly astounded me because at any time massive mountains could be hiding behind a layer of fog, and even once they were revealed, I could not estimate their size. They seemed to fill the view, but I had no idea how big they were because what you might typically use for size comparisons—trees or buildings—were nowhere to be seen. Going back through my photos, I found quite a few where I have managed to get something else into the frame, such as people or penguins. I didn't think my photos would do this scenery any justice. I still don't think they do, but they certainly bring back memories. All I can say is that my studies involving small and microscopic creatures, leading me to instinctively look near my feet to find termite mounds or suspicious logs, did not prepare me for the wide expanses of ocean, the ice, and the peaks I encountered in Antarctica.

During our travels, we were lucky to have the opportunity to visit some local research stations. At Palmer Station, a US base of operations, I met two scientists who studied the gut bacteria of the Antarctic midge, the only insect native to Antarctica. I was not even aware of its existence and astonished that an insect (and only one!) would thrive in those conditions. I was lost for words, certainly not expecting to meet scientists working on such a similar topic to mine in such different circumstances. After I recovered from my initial surprise, I felt a new connection: some of my biological knowledge was finally directly relevant and applicable! We exchanged a couple of thoughts on techniques and findings and it remains a fond memory of the trip.

Upon returning to Argentina, the first thing I noticed—and it hit me like a wave from a calving glacier—was something I am normally rarely aware of: the smell of trees. I must admit it was a welcome change from the thick smell of penguin poo, but beyond that I felt a strong nostalgic response and knew at that moment that I belong on continents that harbor trees and wild animals that are hesitant of me. I can work to contribute to climate change mitigation and thus help Antarctica remain the frozen continent, while remaining at what feels like a respectful distance.

Endnote

I have since found an avenue to do just that, as a consultant assisting large companies and government agencies to adapt to climate change and transition to a low carbon economy.