Waterman Fund Essay Winner

Old Friends in the Alpine

Field scientists on Vermont's highest peak

Catherine Wessel

June 1, 2023. From the Chin of Mount Mansfield, the highest point in the state of Vermont, I watch a stream of hikers cresting the Lower Lip, their T-shirts making dots of bright color across the long face of the ridgeline. It is an unusually spectacular day, all blue sky and sunshine. The air is warm and still, and the mountain has already transformed from a few weeks previous: Growing things have sprung into action with incredible speed and vigor as soon as the snow disappeared. The serene weather feels like a good omen for the field season.

I see an older couple in khakis pausing with hiking poles in hand. I know they are the people I am waiting for: Bill and Betsy Howland. They have generously offered to meet me here, on the summit of the mountain that I am preparing to study just as Bill did for several summers beginning in 1991. Dr. William G. Howland completed a vegetative survey for the Vermont Monitoring Cooperative (now the Forest Ecosystem Monitoring Cooperative) to establish a baseline for monitoring the plant species composition of the alpine zone. He has not stood on the mountain since 1994. His career has kept him busy. He is at the time of this meeting a professor at both the University of Vermont and Middlebury College, and he has directed the Mountain Audubon and the Lake Champlain Basin Program. He retired from the Lake Champlain program in 2016 after seventeen years there. He had told me that he had time to meet me but warned that it had been a while since he had thought of his work on the mountain.

I am touched that Bill and his wife, now in their 70s, were willing to make the journey to Stowe, drive up the Auto Toll Road, and then hike across the ridgeline to discuss research methods. As part of my master's degree project in plant biology, I am resurveying, for the Green Mountain Club, plots that Bill established more than 30 years ago. Though dwarfed by the alpine areas of other states, the 200 acres above the crooked krummholz on Mount Mansfield are some of the most beloved and popular in the state. A weather station located just below the treeline has been logging daily weather since 1955 and chronicling the expected trend: higher temperatures and fewer days of snowpack than when Bill surveyed 30 years ago. The alpine plant community hasn't been assessed since Bill's work here—and I am eager to see if climate change is changing the composition of plants. His graciousness to climb up

Bill Howland, left, studying vegetation on the West Chin of Vermont's Mount Mansfield in 1992. COURTESY OF CATHERINE WESSEL

here to answer my many questions makes me feel welcomed into his legacy on the mountain.

After going over the technical minutiae of research methods, we take some time to explore the mountain's West Chin. I watch Bill reexperiencing a place where he had once spent several long field seasons and is seeing for the first time in almost three decades. He asks me to point out Bigelow's sedge and highland rush to jog his memory, nodding in satisfaction as the distinctions between them start coming back to him. Though walking with careful steps, there is a youthful exuberance to his pleasure of rediscovery. He hurries to see each cluster of flowering plants, taking care to stay on patches of bedrock. When we get to the *Diapensia lapponica*, Bill sets aside his hiking poles so that he can crouch down on shaky knees to admire it. The pincushion plants, so called for their tightly packed growth form, are already in bloom. White flowers stand in stark contrast to dark green leaves. He has a faraway look in his eyes, and a tenderness that makes me look out across the mountains so he can have the moment in peace. When he straightens, we smile at each other, almost shy, but reveling in the day. He says it is nice to see old friends again. He said he hadn't been sure they would still be here and that it is a relief to see them.

It is a passing comment he makes during a half-day visit. I'm sure he won't think of it again. It isn't long before Bill and Betsy have to make their way across the ridgeline again. I thank them for their guidance and watch them begin the slow traverse back, the afternoon light casting everything in a warm glow. I think in amazement that the last time Bill walked that path back to the summit station, I had not been born. Being atop a 400-million-year-old mountain range makes me feel the brevity, not only of this summer that I have before me, and not only of all the collective research that has been done here, but of the whole scale of human life. All of it is fleeting.

And the moment of Bill leaning close over the alpine flowers was even more fleeting, yet it took hold in me. It became something I replayed throughout the field season without knowing why at first, but I called it to mind often: the rediscovery, the surprise, the delight.

July 25, 2023. When I arrive at Thunderbolt Gap, I admire how the ridgelines of the Green Mountains spread out in all directions—for about ten seconds, before clouds whisk in. A small cluster of red spruce, hunkered against bedrock fifteen feet away, appears and disappears as shreds of fog drift over. A wall of clouds settles in, separating me from the wider world.

I check my watch: 7:20 A.M. The view is unlikely to open up again before midday. I zip my down coat against the growing moisture in the July air and unpack four one-meter lengths of polyvinyl chloride pipe (PVC) to assemble a square frame.

It is a routine I know well at this point in the summer. I've spent most days of the last two months hunched over this simple tool constructed of PVC with strings subdividing the square meter into smaller cells. Standing up, I record percent cover of bedrock, loose rock, and soil. I sit to take the slope aspect and angle, and to measure soil depth and pH. Time slows down as I begin to identify species and determine their percent cover in each cell of the square frame. By the end of the process, my face is inches from the ground, and I am peering through a hand lens to check the leaves that curl in on themselves on juniper haircap moss.

The species found enduring the extremes here are some of the hardiest and most diminutive plants in North America. *Minuartia groenlandica*, known familiarly as stitchwort, seems to do as its name suggests, stitching together the expanses of rock by filling each crack. Its five-petaled flower bobs on an impossibly dainty stem that seems impractical for wind exposure. After ticking off twenty or so common vascular plants—bilberry, blueberry, lingonberry, balsam fir, and so forth—I get on my hands and knees to peer at some of the more unusual subjects. As the search gets smaller, the common names drop away. There is *Stereocaulon subcoralloides,* a lichen that looks exactly like the clouds if they were calcified and plastered on rock. Each *Dicranum* moss is a tuft like the hair of a tiny troll, all the species imperceptibly different. *Barbilophozia attenuata* with its three-pronged leaves is, I think, the alpine's striped maple in miniature. For most of these non-vascular and lichen species, even if they look familiar, identification must be confirmed by microscopy. I carefully package and label pieces to take down the mountain with me, genus names often scrawled followed by question marks.

I scour each layer of the knee-high canopy: through the knot of woody bilberry branches dotted with lichens, down to the mid-story shining with blueberries, and past that onto a complex carpet of mosses and liverworts. It is a world that is easy to get lost in, and one that I have grown increasingly fond of, with each day spent on the mountain. But a labor of love is still a labor, and by the end of July much of the splendor has given way to monotony. My lower back hurts. The hike out to study sites is a trudge through a constant puddle that only expands across the ridgeline as the summer progresses. That halcyon day I met with Bill and Betsy turned out to be one of the nicest days

In summer 2023, Catherine Wessel, in the distance, measures the same plot Howland had studied 31 years earlier. COURTESY OF CATHERINE WESSEL

of this rain-soaked summer. I'm tired of wearing a beanie and gloves most of the time.

It makes me reflect on my pathetic endurance compared with these plant lineages that have eked out a living here for thousands of years, some even since the last glacier shrank away 13,000 years ago. Initially, arctic-alpine plants reigned not only on the mountain but throughout the valley too. As the climate grew warmer, their range became limited to mountaintops, where things have stayed cold and brutal. When I spend a day on the mountain without seeing another soul, there is a way in which time ebbs. I imagine if I could look over my shoulder fast enough, I might be able to see the landscape of the past around me. A colder place with tiny red jewels of lingonberry gleaming all across the hills. Though we don't have a reference point in the form of species composition data in that deep frame of time, at least there is a record of 30 years ago. It feels like a laughably small slice of time in comparison.

August 18, 2023. I think of Bill greeting the pincushion plant again on the late August day when my feet lead the way off the ridgeline for the last time in my field season. I wonder if he remembers how he felt saying goodbye to it on his last day of field work in 1994. I feel a sense of already missing something intertwined with the relief of completing the field season. I'm sure I'll have passing flirtations with the mountain again on fair-weather hikes. But that will be different. I won't be privy to its many moods, the unfolding of the seasons, the long uninterrupted hours day after day. And more than that, I anticipate greater loss of not only being absent from here, but how it all may change.

The wind has died down, and I can pull my hood off. I have forgotten what the quiet is like. Now the only sounds are my own breath and a white-throated sparrow's song. The sun casts yellows and oranges over the bedrock, and by the time I dip back into the balsam firs, I am shedding my layers and the sky is easing into evening blue. Like every other day on the mountain, the bluster and fine mist of the morning through early afternoon has faded from my mind. And now, unlike any other field day, I hold no anticipation of retracing my steps on familiar footholds tomorrow.

I am now beginning to make sense of why seeing Bill, smiling at all that he saw, stayed in my mind throughout the summer. I nod goodbye to the last of the moonworts by the summit station as I try to picture what all this may look like on a return decades from now. In alpine time, it is the blink of an eye, and yet the climate and plant communities may change in those years. The human concept of stasis is undeniably different from what it may be to a mountain. Wrapped up in it are both the selfishness of keeping what has been familiar in our lifetimes unchanged and the weight of reckoning with our role in creating a rapid alteration of our planet's climate. I consider all the transformations the mountain has experienced throughout time, the resiliency in that, and yet the coming change is imposed on a much faster time scale—the human one. I ponder this the whole way down, and when I reach the valley below, I feel like I have arrived from a distant planet.

I decide the best thing to do is set aside the philosophical pondering. What I know is this: When Bill returned, he had changed, and yet the mountain seemed unchanged. As I crane my neck for one final glimpse before driving away, I consider how that blessing might feel. At the same time I feel the fear that should I come back here in 30 years, I don't know how changed this place might be. A place that, despite the sawflies, despite the 30 mile-per-hour winds, despite the falls on slippery rocks, is somewhere that has become dear to me.

January 15, 2024. I try to conjure the physicality and vividness of the summer as I spend the next months inputting lines of data in Excel, typing code in RStudio statistical software, trying to make sense of what I observed. Seeing that species composition has not yet significantly changed both reassures and unsettles. Is it reasonable to hope that these alpine plants will survive for many more decades? Is it more responsible to fear? Findings that show continuity in plant communities may just be marking lag time before climate change impacts become apparent. It's easy to grow weary and wonder at what can be done, especially with long days of staring at the computer, confronting the bleakness of climate trends. Yet outside my window, the mountain stands clear and brightly snowcapped against the blue sky, enduring it all. I think of David Steindl-Rast, the Benedictine monk, telling his friend, poet David Whyte, "The antidote to exhaustion is wholeheartedness."

And that is what the moment on the mountaintop with Bill has given me. We cannot know what we will find in the future. When confronting this, I find it easy to accept the protective balm of cynicism, harder to stay open to the world, to admit to harboring hope for it. I think how none of this is certain, none of it promised, and yet how that doesn't mean not worth it. How all will change, and yet some things may surprise us. How all of it exists both within our own timescales—field seasons of research separated by decades—and the deep time that can be felt standing on a mountain peak and thinking about the geologic mountain-building events and glaciation that created all of this. How endurance and transformation are not necessarily separate processes. So, after creating trendlines for the rising January temperatures and feeling my own despair rise in accordance, what I reflect on instead is this: Bill smiling down at the *Diapensia lapponica*, eyes crinkled in delight, looking back at me, astonished.

Catherine Wessel is a graduate of the field naturalist program at the University of Vermont and a field ecologist. She lives in Burlington.

Since 2008, Appalachia *and the Waterman Fund have partnered to sponsor an annual essay contest for emerging writers. The fund provides generous prize money and works with the journal to choose winners. For details about how to enter next year's contest,* *see A Peak Ahead on page 160.*