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The Andes Mountains are one of the world's grandest landscapes: towering peaks surround breathtaking valleys dotted with the enduring constructs of ancient cultures. They form an imposing, snowcapped wall along the western border of the world's largest and grandest rainforest, the Amazon. Yet the Andes are some of the youngest mountains in the world, still growing and changing the same as are those landscapes in which the ancient cultures once lived. For the people living there now, changes in their environment can be devastating to their livelihoods and health.

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# AQUATIC INSECTS OF THE ANDEAN CLOUD FORESTS AND THEIR ENVIRONMENTAL IMPORTANCE

For my Burch Fellowship project, I traveled to one of these rapidly changing landscapes, the cloud forests of Eastern Peru, to study the health and biology of mountain streams, essential sources of water for many people. Using the insect inhabitants of the stream itself, I set out to discover what change might mean for this ecosystem.

The cloud forests of the Eastern Andes are unique ecosystems, so much so that most of the Peruvians I met consider them national treasures. They are called cloud forests because their high elevation means that warm water from the Amazon becomes clouds at the level of the forest, which the trees, mosses, and other vegetation then capture, creating a cool and constantly wet habitat. These forests make up the western edge of the Amazon Rainforest, and their tiny mountain streams make up the headwaters of most of the waterways that eventually form the famous Amazon River. These forests are some of the most biologically rich and diverse areas of the world, home to colorful species of birds, frogs, and insects that cannot be seen anywhere else. They are fascinating, beautiful, and vital ecosystems that still hold many mysteries, and I was one of the few who had the opportunity to investigate them.



The focus of my research was on aquatic insects and where they live in the cloud forest. While in Europe and North America freshwater-dwelling insects are commonly-used tools for water-quality analysis, in most of South America this is impossible due to a dearth of information on what is actually

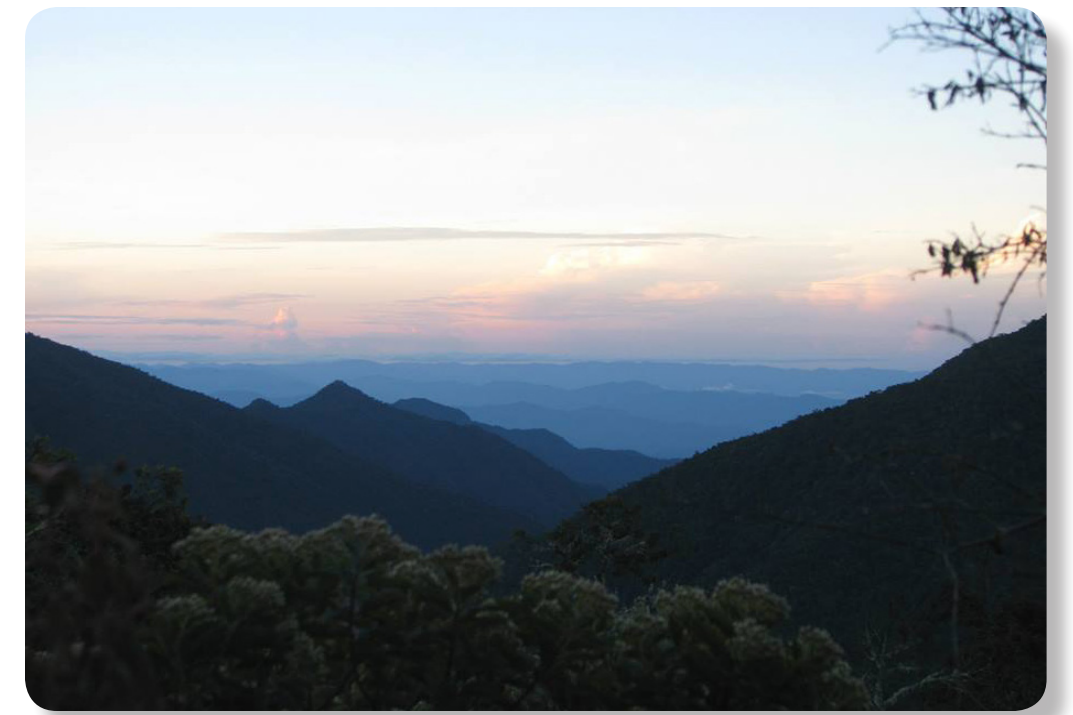
in the rivers. In Peru specifically, activities such as mining and illegal logging are polluting the mountain streams that people in the Amazon depend upon every day, and there is always the looming threat of climate change. With my project I collected data on where different types of insects lived along the mountain slope and determined what water conditions these insects were living in. This data will help researchers and conservationists alike to understand the delicate balance these streams have with their environment.

Carrying out the project was a test of endurance and the ability to improvise. Collecting insects from a stream entailed

standing in the frigid water for hours, clambering over rocks, and ducking through nearly impenetrable foliage. Sometimes the rain would pour down for days and ruin my plans for fieldwork. Often the streams would be in a steep rocky gorge, and require climbing

to it; other times I would have to camp overnight along the dirt road in order to take advantage of as much daylight as possible. I was always two hours from the nearest food store, doctor, and mailbox, and hitchhiking on top of banana and bamboo trucks was the only mode of transportation. There were some times that I wanted nothing more than to fly back home for a few days.

However those days passed, and all of the discomfort and discouraging obstacles were meaningless compared to the rewards of simply being there. My hikes took me past towering waterfalls and gorgeous overlooks. The trees around me were always decorated with vibrant birds that produced beautiful songs that few people from the Northern Hemisphere have or will ever hear. As I worked I would turn over something unexpected, some fascinating new insect or a familiar one of a startling proportion. I never stopped discovering and learning from the life that was all around me, and that thrill made everything worth it. Much of what I



learned came from the people I met throughout the summer. Since the valley is home to many research stations there was a steady influx of scientific investigators, both Peruvian and international. They would discuss their projects with me over mealtimes or chat about their experiences in the field as we waited for the rain to slow down. While watching passionate experts work taught me much, I probably learned the most by simply living with and talking with the local residents. All of the workers at the stations were from nearby towns or villages. They shared with me an invaluable amount of knowledge of the type that can only be gained by growing up in the area and feeling an intimate connection to the health of the cloud forest.

When it was finally time to return to the city and fly back to my own country, I was sad to leave, but satisfied with what I had accomplished. I had succeeded in collecting the data I needed, learned more than I ever expected about a new environment, and even gave back to the station by analyzing the quality of their drinking water. Thanks to the Burch Fellowship, I returned to my country with so much more than when I had set out: lessons in perseverance and courage that will help guide me through the coming years of research and discovery.

