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The Burden of Facts and the Joy of Discovery

Mark R. Luttenton

"The world is a book and those who don't travel read only one page."—St. Augustine

When I watch youngsters splash through a stream in pursuit of frogs or crayfish, squealing with joy or staring in amazement, I am reminded of why I decided to become a biologist. The fascination that children have for the natural world, their rush of questions about what they are seeing, should serve as the basis of intellectual thought and life-long inquiry, but unfortunately, that original spark is often extinguished, and the result is an attitude toward learning that ranges from apathy to disdain to mere practicality: "Why do I need to learn this?" and "Will this help me get a job?" When wonder and amazement are fed with nothing more than a progression through a text, chapter by chapter—the methodical march of memorizing and summarizing—the joy of discovery is replaced by the burden of facts, lugged about in the head for the exam and then forgotten.

If there is any subject that should hold great interest for everyone, it is biology, the study of life. But, in the classroom, the study of life is often distilled to facts and figures. Sometimes those facts are supplemented with a look at a few dead things to serve as "representative organisms," and as a colleague of mine once noted, such biology is not the study of life, but the study of death.

To help students regain their sense of wonder about the natural world, I need to remind myself of what captured my imagination as a young student, what I originally found exciting about biology, and come up with ways to relay that excitement in an educational setting.

From the time I entered high school, I have been intrigued by the tropics and particularly by their coral reefs and rainforests. When E. O. Wilson³ brought to the forefront a concern for the loss of tropical ecosystems and diversity, I took every opportunity to present the issue to my students. I would show videos and slides that portrayed the unique diversity of these areas as well as the destruction they were undergoing—all in an effort to inspire an appreciation for and interest in the subject. Yet, I was consistently frustrated in my attempts to create an image of a system which exhibits such complexity.

However, during the past several years I have had the opportunity to indulge directly my own curiosity and, at the same time, offer groups of students the chance to indulge theirs. I have offered a spring-semester course in Belize. Although a small

³E. O. Wilson is Pellegrino University Professor and Curator in Entomology at the Museum of Comparative Zoology, Harvard University. He has written several books, two of which won Pulitzer Prizes. He has become the unofficial spokesperson and defender of biodiversity, based partly on his research, focusing on ants. He was editor of *Biodiversity* and author of *The Diversity of Life*, which speaks directly to the loss of species diversity.

country, Belize has the second longest barrier reef system in the world and representative examples of all of the major ecosystems found in Central America.

Our plane approaches Belize International Airport from the west, gliding over the thick green vegetation. As soon as we climb the stairs down to the runway, we are engulfed by a wave of heat and humidity. We walk to the terminal and slowly file past the customs agent, one at a time. We spend the next two weeks not just talking about the tropics, but surrounded by the tropics (Belize is actually sub-tropical). The plants, the animals, the people, and the heat give us an experience that slides and videos cannot. We sleep and it is hot; we eat and it is hot; we take notes, and it is hot. It rains a lot, and it is still hot. After only a few days in the forest, our belongings start to mildew and take on a strange smell. We are in the middle of our new classroom.

We spend the first night at the Hotel Mopan, in the historical part of Belize City, near the old Government House, where the Governor General lived when Belize was a colony of Great Britain. The Mopan is also near the Anglican church, built about 1812, with bricks used as ballast in slave ships. Small and modest, unlike the Radisson and other hotels which are quite Western in design and service, it is owned by Jean Shaw, a travel agent who is influential in the ecotourism business; thus she is very active in protecting the environment and preserving Belizean history.

During our dinner of chicken, beans, and rice— tastes that will become all too familiar—Jean tells me that the man sitting at the next table is a researcher with the New York Zoological Society, working on a howler monkey recovery program. She asks him if he will give us a short lecture on his current work, and he agrees. On another evening, an associate of the Minister of Tourism and the Environment will talk to us. On a visit to a late classic Mayan center on the Western border, we hear a group of UCLA archeologists discuss their latest thoughts on Mayan archeology, and Jean arranges for them to come talk to us at an after-dinner event.

Belize, although about the size of Rhode Island, supports over 400 species of birds. This fact alone serves to illustrate the meaning of biodiversity. After a few days in the country, I point out that we have already seen more species of birds in these few days than they have probably seen in their entire life in Michigan. After we snorkel on the coral reef, I make the same observation about the fish. Yet the birds and the fishes represent only a small fraction of all life in these tropical regions.

Although biology is the primary focus of the program, a true understanding of the region must include the social, political, and economic structure as well. After all, it is these last three factors that have been central to the destruction of so much of the tropics. So every year we hear a discussion of the early history of Belize City and are taken on a tour of the old part of the city by Meg Craig, sister of the former prime minister and author of a book on Belizian folklore. She tells about the people, their hearts and souls, how they live and how, often far too young, they die. Tropical diseases and Western colonialism have been intimate partners.

We also discuss the global forces that drive the market price of Belizian citrus with Mr. Reynolds, president of the local citrus growers cooperative. A man in his early sixties, he wears a torn (but clean) tee-shirt and prefers not to wear shoes. The

cooperative has been concerned that the breakup of the Soviet Union will drive down the price of Belizian citrus fruit if the U.S. decides to buy citrus from Cuba for political concessions. They also worry that the North American Free Trade Agreement may give Mexico a considerable economic advantage over other Latin American countries. Belize would need similar trade agreements and expanded citrus production to remain competitive. He acknowledges that greater citrus production would result in further destruction of the environment and that measures need to be taken to limit the impact. Although having only a modest formal education, Mr. Reynolds gives us a lasting impression of the connection between politics, economics, and the environment, as we sit in his small shop, a half dozen shelves partially filled with canned goods and bulk rice, a classroom in the truest sense.

Human impact on the environment in Belize has a long history. The large city-states of the Maya significantly altered the distribution and abundance of many organisms in parts of Central America and the Yucatan. Today, the Maya occupy small villages and farm milpas using slash-and-burn agriculture, often blamed for extensive tropical deforestation. In some cases that is true, but often the actions of farmers are driven by external forces such as economics and politics. Spending time among the Maya, we realize that they possess a knowledge about their environment that surpasses that of many (if not most) North Americans. For example, Mayan children can identify many of the edible fruits and plants and seasonally pick many of their meals from the local area. How many North American children know only that food comes from the local store?

No collection of words or slides can leave so vivid an impression of how the Maya live as visiting a Mayan family for an evening of marimba music. Their house is made of wooden poles, tied together to form the frame. Cohune or bayleaf palm fronds are interwoven to form the roof, and sticks are lashed together to make the walls. Oil lamps provide the only light. The family sleep in hammocks tied from the rafters. The floor is dirt, hard packed from years of foot traffic. Here is another significant "classroom," where we learn by observing.

Sometimes I give a lecture, and sometimes local officials and resource managers provide guest lectures, but most of what we learn is through observing what is around us. In this setting, I am no longer the "instructor"; I do offer answers when I can, discuss possibilities and haul around books with me for reference when I cannot, but I am as much a student as any one else in the group, exercising my curiosity through personal observation. I encourage the participants to think of their "teacher" as their own curiosity, their observations, and their open minds. Such learning is a natural process in which we all had practice as children.

In its mission statement, Grand Valley calls the University a "learning community where close student-faculty interaction enhances both teaching and learning." In the best of classrooms, the participants are teachers and learners simultaneously. On many occasions, students have shown or relayed to me information about things I did not know. In Belize I am again like a child, wondering about and fascinated by the world. As educators, we can only benefit from sharing with our students the true joy of discovery.