Asking for a "dream" summer job aboard an underwater habitat launched this scientist on her career, charted to her specifications.

By Ellen Prager '84

Ellen Prager '84 first saw Hydrolab, an undersea research habitat, on a field trip while she was spending a semester at the West Indies Laboratory in St. Croix. Intrigued, she bicycled over the hilly roads of St. Croix the next weekend and asked whether a job might be available for someone who was enthusiastic, hard-working, and scuba-certified.

"After assuring them I could carry a set of twin scuba tanks in each hand (barely) and that I had experience as a diver, I got the job. Upon my return to the teaching laboratory, all of the other students wanted to know just one thing: How had I landed such a plum summer job? The answer, of course: I asked."

Her active approach launched an unconventional career in marine science and undersea exploration. Prager talked to Wesleyan magazine about a job that's always an adventure.

I quickly discovered that the title "support diver for Hydrolab" was a euphemism for "underwater slave," yet it was the best summer job ever and helped me to network with the marine science community.

At the time, I was not yet convinced that I had what it takes to become a scientist, but one mission changed my mind. A team of scientists was conducting research to quantify the role of parrotfish in nutrient recycling on the reef. Parrotfish are abundant herbivores. They feed by grazing algae off coral surfaces and in the process ingest the calcium carbonate of coral skeletons. So in their pursuit of scientific knowledge, these researchers dove outside the habitat at night, swimming after parrotfish with plastic bags at the ready to catch their feces for later analysis on shore. Well, I decided that if collecting parrotfish poop is science, I have the makings of a scientist after all.

Though I don't have one favorite place to dive (I have favorites for different reasons in different places), I do love the Galápagos-the tropical coral reefs along with sea lions and penguins. How bizarre is that? While attempting to conduct coral reef surveys there, the female and juvenile sea lions would constantly harass us, wanting to play and often trying to snatch our underwater cameras, survey gear, and even pulling our fins and hair-not really such an unpleasant hindrance to one's workday.

< Opening photo: Ellen Prager feigns being a predator on a Caribbean coral reef. (bottom of page) Ooids under a low-power microscope, courtesy of E. Prager.

Upon completing my doctorate, I was strongly encouraged to seek a position at a large research university. However, I chose instead to join the science faculty teaching oceanography at Sea Education Association

(SEA) in Woods Hole, Mass. SEA is a semesterlong program that combines six weeks of classroom work with six weeks at sea aboard a tall sailing ship. Mentors warned me that by making this choice I would never return to research. While it was a nontraditional choice, it was a wonderful experience. At SEA, I gained invaluable teaching experience, learned to communicate to a wide variety of audiences, and dealt with a whole host of difficult situa-

tions: a ship full of extremely seasick students; a howling gale and 25-foot seas; serious sleep deprivation; one memorable undergraduate who decided, without notifying anyone, to go off his antidepressant medication just before sailing; and an infestation of mealy bugs in a student's bunk. She was mortified and convinced that she had worms. I reassured her, washed out her clothes, and explained that someone had made the mistake of storing a cardboard box, instead of using a plastic bin, below her bunk. You don't pack things in cardboard out at sea for just this reason.

During one SEA trip aboard the 130-ft. Westward, we stopped in the shallow, aqua blue waters of the Bahamas to collect sediment for an experiment I was conducting at a flume laboratory at MIT. We took an inflatable boat from the ship into the shallow waters off Cat Cay, well known for its fabulous ooid shoals. Ooids are small spherical grains of calcium carbonate found in only two places in the world today, the Bahamas and Persian Gulf. They were more common in the Earth's geologic past. I needed a large quantity of

ooids for my experiments and thought it would be an exciting opportunity for the students. Being thoroughly delighted by this earthly wonder myself, I repeatedly tried to elicit enthusiasm from the students, who were, at best, mildly curious, but clearly did not share my fervor. With Tupperware containers and plastic bags in hand, I jumped out of the small boat and was knee-deep in ooids, while my students stared at me with only amusement. However, as soon as they jumped in, they,

too, understood my passion. They were so amazed by this sand composed of millions of beadlike grains that they all wanted a container of their own.

People, particularly children, are fascinated by the diverse assortment of sands on our planet, from the beadlike ooids to crystalline grains of black, green, and red. I often go into classrooms with my collection of sands from around the world, which is a winner with young and old alike. Sand was the topic of my first children's book, published by the National Geographic Society in 2000. And while at SEA, I was able to conduct a research project, whose results I published in a peer-reviewed scientific journal.

Another interesting career choice was being the director of a marine laboratory on a very, very small island in the Exumas, Bahamas. I found that the phrase, "lonely at the top," could never have been more true. The only thing on Lee Stocking Island was the marine laboratory, for which we generated our own power, water, and brought in all the food and supplies. As director, I was responsible for literally every person on the island—they either worked for me or came under my purview as a visitor. In this year there were 19 named hurricanes-and I had to decide if and when we would evacuate the island. It was a stressful year in many ways. We had one storm that passed by and then, as some hurricanes do, did a loop-de-loop and came back on us. We had some damage, a bit of flooding, but luckily no injuries.

Hydrolab has been retired to a nice, dry spot in the Smithsonian. It has been replaced by the Aquarius, a larger, more advanced undersea habitat in about 60 feet of water, located nine miles from shore in Key Largo, Florida (www.uncw.edu/aquarius). As a marine scientist and an experienced diver familiar with habitat operations, I was asked to participate in a two-week mission to survey the surrounding reef, test newly installed equipment, and help with public relations. As new technology would enable live television broadcasts from inside the habitat for the first time, I decided to pitch a live interview to the Today Show, the ocean equivalent of a first-time piece from the space station.

After many phone calls and e-mails, they agreed. During our early preparatory discussions, I requested a (right) A diver taking a photo of the Hydrolab habitat. (below) A brittlestar at night; coral polyps above extended for feeding.>

list of questions they might pose on air, before millions of people. The producer quickly informed me that such questions are simply not given out beforehand. I thought that the producer, not being a scuba diver, should

know about nitrogen narcosis: During deep dives, or when living underwater for 24 hours or more, the body becomes saturated with gas, much of which is nitrogen. Ever heard of nitrous oxide, better known as laughing gas? Nitrogen narcosis, a result of too much nitrogen in your system, transforms jokes, situations, and comments that are mildly humorous up on dry land into roll-aroundon-the-floor, tears-coming-out-of-our-eyes funny under the sea. Divers can really buckle down and focus when it comes to serious tasks, like safety and work, but in lighter moments the laugher is loud. I wasn't so much worried about my exact answers, I told the producer, but more about being prepared enough to be coherent and about not starting to laugh because I'd been caught off guard. As I'd expected, the producer was now happy to discuss questions that might be asked on air.

Living under the sea is not for everybody. Six divers live in Aquarius, in very tight quarters. You

have very little privacy, so you want to make sure you have a laid-back fun group. Personally, I loved living in the "human bowl"; the fish swam by, observing us through the viewports, and a few even became regular visitors. Whenever I give talks, the question always comes up: "Where do you go to the bathroom?" There are two choices: a toilet, with a little curtain across it, for "privacy." But the toilet sometimes gets stuck, so the staff prefer the other option, the "become one with the sea" option—do it with the fish. However, human waste is

(top) A Galápagos sea lion; photo courtesy E. Prager. (bottom) The Aquarius undersea habitat; photo courtesy of Mark Ward, NURC/UNCW

yummy fish food, and sometimes the fish are quite aggressive. I know of one instance in which they even drew blood.

Going to work each day under water has its pros and cons. Getting dressed means a cold, wet wetsuit. We rinse our wetsuits each night in soapy water, but they never dry. Some unlucky aquanauts acquire a fungus infection that we call "the creeping crud." Though the wetsuit is cold and clammy, you just have to climb into it, get in the water, and go. The truth is that you quickly forget about the unpleasantness of that wetsuit as soon as you are swimming amid the wonders of the coral reef and focused on getting your work done.

Another more humorous aspect of living undersea is what 2.5 atmospheres of pressure will do to anything with air in it, especially food. A bag of chips ends up as a bag of little pieces of chips.

Once someone sent us down, as a treat, a lemon meringue pie. Meringue, however, is mostly air. Moreover, your tastebuds don't really work the same undersea, so everything tastes bland. The end result: a vellow slime pie. What a treat!

Still, it's all worth it to live undersea, because the Aquarius allows scientists the advantage of time. If we were diving from the surface we might have an hour, maybe two, to explore at that depth every day. But when living in Aquarius, divers can spend six to nine hours a day down to a depth of 115 feet. On my first Aquarius mission, we were sort of guinea pigs, trying out some really cool innovations, such as technology that allowed us to fill up our scuba tanks on our back while under water, like an undersea gas station. We discovered, however, that they had made the connection hose too short. One of the aquanauts wasn't tall enough to reach it without help. It was a great innovation nonetheless. During long dives working down to 115 feet, every

few hours we'd fill up our tanks at the underwater filling station, where we'd also leave snacks.

I later discovered a new niche, one that is under-represented in science, greatly needed, and that fits both my strengths and interests. One of my strengthsand something I greatly enjoy-is communicating science to the public. My recent speaking engagements run the gamut, from a student ocean conference at the Florida Aquarium to a conference of meteorologists in Steamboat Springs, Oceans Week on Capitol Hill, and even a Wesleyan reunion.

I've now published two popular science books with McGraw-Hill, three children's books with the National Geographic Society, and have just released a new fiction book for young readers, Adventure on Dolphin Island, which combines an exciting adventure story (and some of those adventures were mine) with real ocean science and a conservation message.

My media work also continues and I'm getting better in front of the camera—though I still struggle with how to be animated while discussing tragic events, such as the December 2004 tsunami. If you come across too animated, it's inappropriate. If you come across too dull, you just can't be effective on television. I've been told, "You have to divorce yourself from the incident and its horrific nature."

Today we face complex environmental challenges-non-point source pollution that contaminates our coastal waters and increases the risk of harmful algal blooms, dramatic declines in fisheries, coastal habitat loss, invasive species, and climate change, to name just a few. A critical part of finding solutions is imparting a basic understanding of the ocean to the Earth's citizens, and through that, fostering stewardship. While informing our adult populace, particularly our political leaders, is important, it is essential that we also engage our young, the world's next workforce and a new generation of leaders. 💔

Do you have an opinion about this topic? Please write us at letters@wesleyan.edu.

