

## ANN LOFQUIST

*Otter Point II*, 2011  
Oil on Canvas, 8½ in x 13 in.



courtesy: Winfield Gallery

## STEVEN HADDOCK

### The Other Jellyfish

Surfers run toward the water and walk away from it. The sea beckons them, and only grudgingly do they slip from its grasp after “just one more” wave.

Bounding out the front door on a hot summer day, I could feel the sap rise in my veins and a giddy feeling overtake me. It wasn’t just the knowledge that I would soon be at the shore; an atavistic liberation was taking place inside.

On land I was, as my names implies, a fish out of water. When summer came around, my body would flip-flop breathlessly back toward the waves, toward the hypnotic rhythm of sand, sea, salt, splash, sand, sea, salt, splash. Home at night I would feel the prickly tautness of salt-encrusted skin, sand from every crevice and follicle coating the sheets while I sought the cool side of the pillow.

Most days I just carried bus fare and a backpack with my towel, book, mask, and fins. Some days my friend and I would haul our scuba tanks, wetsuits, and weightbelts to the bus stop and board, avoiding the bemused or annoyed stares of the passengers whose toes we trampled. My mom didn’t just tolerate these activities but encouraged them, helping me get scuba certified before my fourteenth birthday.

I would leave behind the crowded, rumbling city bus and head toward my true habitat at the sea. As I hiked down the narrow stairway leading to the sandy crescent of my cove, I would hear the waves breaking, and I felt as though I could judge the temperature of the water by the crispness of its sound. I would plunge in openmouthed, gliding just above the ripples in the sand, and be cleansed. At the time, I didn’t know about the 30 million bacteria and 300 million viruses I was ingesting with each mouthful, but I was cleansed nonetheless, free, and connected to the animals living within.

I had no real-world problems. My teenage solitude vanished in the company of the beach and a book. I still have some of those books, their pages stained with sunscreen. As I read, I became the languishing youth in Albert Camus’ *Summer in Algiers*, admiring the “cool-limbed girls” in the North African port; Churchill sparring with Stalin in Paul Johnson’s *Modern Times*; the explorers of mysterious islands in the novels of Jules Verne; or a “baitman” being dangled under a Venusian sea in Roger Zelazny’s *The Doors of His Face, the Lamps of His Mouth*—years later I would reenact that scene hundreds of times during blue-water dives in the open ocean.



*The parallel walls of the deep channel in the reef widened at the bottom into overhanging ledges, which trapped air from the roiling whitewater. In these bubbles I noticed some curious limpets—conical snails that I later found to be an unusual air-breathing lineage.*

The hero in Zelazny's story says, "When I was young I thought that being born a sea creature was the finest choice Nature could make for anyone." And so it was for me. I trace the beginning of my journey to my teenage years: all that time I'd been working on becoming a marine biologist.

I didn't know that the stories I read while at the beach would end up shaping my future. The words I osmosed from those sun-bleached pages would help me score high on standardized tests that admissions committees prized. Working on a Ford Cortina with my dad and programming crude video games would lead me to an engineering school, which would introduce me to my biology professor, who, amused by my constant questions, would nudge me toward graduate school—an option I hadn't considered. It took me a long time to realize that I could make the thing I loved into the thing I did.

Becoming what I wanted to be began on an ocean trail I traversed each day with my dive mask and orange Duck-foot fins. These were my jet pack, my magic carpet, as I flew through an underwater slot canyon that cut into the rocky reef framing the cove. Here lived a moray eel that divers would feed with urchin roe on the half shell (a slimy salty delicacy that my brother and I would later sample on

some saltine crackers). An urchin-lined tunnel ran from one part of the cove to another, and we would dive into it, bracing patiently against the swell at the midpoint before swooping through to the surface on the other side with our pulse pounding in our ears. An octopus became a spirited playmate, especially one that we hauled up on the beach and deposited on my sunbathing sister's back.

The parallel walls of the deep channel in the reef widened at the bottom into overhanging ledges, which trapped air from the roiling whitewater. In these bubbles I noticed some curious limpets—conical snails that I later found to be an unusual air-breathing lineage. Although they normally lived in wave-swept caves above the high-tide mark, this population managed to survive fifteen feet below the surface, with air provided by wave action. This simple observation led to my first real scientific publication, thanks in part to a kindly editor at the journal, who must have recognized my naïveté, and again to my college biology teacher, who took care of the journal's page charges for me. It now occurs to me that he must have paid this out of his own pocket rather than dealing with university bureaucracy, one of his many subtle deeds of generosity that helped me along this course in life.

Sometimes during my summer pilgrimages, the shore was littered with jellyfish, and everyone would speculate how this bloom came to be. Although jellyfish are usually said to be "invading" beaches, it was clear to me which of us was the visitor in the other's environment. To them, I was *Xenohominus haddocki*, a species never before seen by jellykind. On occasions, when the grunion were hovering expectantly offshore or when jellyfish were abundant, I would take off gliding across the face of a wave only to end up with a fish or medusa down the back of my trunks. A lapse of respect for the ocean and its inhabitants would earn the cavalier aquanaut the badge of a scrape, a sting, or a smash against the sand.

These daily observations must have been in the back of my mind when I started the Jellywatch.org project. Every day throughout the world, people observe the ocean. These citizen scientists can help address questions that are beyond the scope of any individual research program, and jellyfish are perfect subject matter: they can't be detected by satellites or automated instruments, yet even children know a jellyfish when they see one. To get an accurate

## ANN LOFQUIST

*Garrapata, 2011*  
Oil on Canvas, 8 x 12 in.



courtesy: Winfield Gallery



At night I peer through a microscope until bleary-eyed. In the morning I peer out the porthole of a submarine, watching the surface light fade to inky black as I descend into the deep sea, with animals swirling past outside.

picture of jelly blooms, we just have to get the word out to people and have them share their observations using the Web or a smartphone. On Jellywatch we have received thousands of reports and stunning images of jellies around the world, from arctic Svalbard to the South Pacific, sent by Indonesian and Brazilian incarnations of the teenage me.

\* \* \*

I will always remember my first glimpse of a comb jelly. These ctenophores appear to be propelled through the water by magical rainbow power as their bands of cilia beat in waves, like tiny oarsmen arrayed in iridescent rows along the length of their body. In pale blue Caribbean waters, I had my first blue-water dive, hovering miles above the bottom with endless ocean in all directions. Using the improvised sign language favored by divers, the world’s foremost ctenophore expert gave me an underwater lesson on collecting my first comb jelly in a glass jar. This species has the ability to shoot out a burst of red ink when disturbed, so the trick was getting the lid on while they remained unaware that they’d been captured. Other comb jellies trail two long tentacles, so you give them a little tap and they retract and zip away ... straight into your sampler.

Ripple, unfurl. Ripple, unfurl.  
Now you’ve done it! Struggle in my sticky web.  
Spin spin spin, and down the hatch.  
Ripple, unfurl once more.

Ctenophores (“comb-bearers”) are the largest animals to propel themselves with cilia. Shaped like transparent grapes, sacks, biplanes, or butterflies, they glide through the water and ensnare or engulf their prey. They are among the most luminously gifted of all creatures, and can produce cascades, clouds, and concussive flashes of light. For the few that are lucky enough to see one alive, ctenophores inspire wonder and bemusement.

This first research cruise is a fully immersive experience. At night I peer through a microscope until bleary-eyed. In the morning I peer out the porthole of a submarine, watching the surface light fade to inky black as I descend into the deep sea, with animals swirling past outside. On an afternoon swim call, sporting my well-loved pair of Duckfeet, I drift among moon jellies, which bounce off my skin, occasionally hitting the tender skin of my upper lip with an electric zap.

Pulse, glide. Pulse, pulse, glide.  
Tension. A tug. An explosion.  
The delicious tingle of venom coursing through those thousand tiny darts.  
Spasm ... and release.  
Pulse, glide. Pulse, glide.

Scyphozoans (“cup-animals”) are the large mushroom-shaped jellyfish that most people see washed up on the beach: the sea nettles, moon jellies, cannonballs, and mauve stingers. They are the most massive of the jellyfish, attaining more than a meter in diameter, although they’re not the longest nor the most dangerous. Many of the well-known species that clog fishing nets or wash ashore in great numbers spend part of their life cycle as a polyp, a tiny flower-shaped bud attached to rocks or a floating dock. This inconspicuous stage is actually the key to their ecological impact, because when the polyps start to bud off thousands of tiny jellyfish, these medusae drift along together and grow up to become a “bloom.”

In warm turquoise waters of the Gulf of California twenty

years later, the pink threads of siphonophores—miniature men o’ war—show no such mercy, searing my face, which tastes to them like the tiny fish upon which they prey.

Flick, glow. Flick, flick, glow.  
Come a lit-tle clo-ser to the light. Nibble, zap, squirm!  
Engulf and digest.  
Flick, glow. Flick, glow.

Siphonophores (“tube-bearers”) are long (some say the longest) animals that can stretch for more than 100 feet. The Portuguese man o’ war, admittedly not very tubular, is the most familiar species, but other shapes and sizes live in great abundance throughout the ocean. On deep-sea collecting trips we have discovered species that use glowing luminous or fluorescent lures to attract fish and krill to their batteries of stinging cells.

In the chill black waters of the Pacific, on a moonless night, we descend like bait along a line suspended from a bobbing float, lit only by our dim red flashlights. All around us constellations of luminescence shimmer, punctuated by supernovas of light from invisible comb jellies that surround us. Vertically migrating medusae, with tentacles sprouting up like water from a lawn sprinkler, emerge from the depths to pulsate around us. Tubelike salps, flapping snails, and flattened fish larvae flutter by, all so transparent you can see their organs.

These first-hand views of the overwhelming abundance and diversity of jellylike creatures have given me some idea of what it means to be a jellyfish. The public embodiment is often a chimera of traits that don’t appear together in any real animal: huge yet invisible, deadly to humans while subsisting on microbes, graceful and beautiful yet called cockroaches of the sea, fragile yet indestructible—the last animals to survive in a postapocalyptic ocean. We can try to use science to stem the flood of misinformation, but for me a more effective way to overcome these misperceptions has been to create videos. One called “There’s no such thing as a jellyfish” challenges this amalgamated view of gelatinous animals. It tries to convey an appreciation of their unique shapes and functions, their distinct evolutionary history, and their variety of important roles in the ocean.

Jellylike animals are the earliest diverging forms of animal life, and they teach us about the origins of nerves, muscles, and the genetic toggles that give rise to developmental patterns. Proteins that jellies use to make light have been co-opted to study disease, a study so useful that the researchers wond the Nobel Prize in chemistry. In 2008, the government officials in India bemoaned the overharvesting of jellyfish (an Asian delicacy) because it put their population of sea turtles at risk. Sea turtles can migrate 9,000 miles across ocean basins to dine on blooms of jellies that most people would consider a nuisance. The ocean has its own balance, and it has no tolerance for our ham-fisted attempts at tinkering. When comb jellies from the Atlantic Ocean were introduced into the Black Sea by ships, they decimated the local fish populations. Only when a natural predator—another comb jelly species—found its way there as well was the original invader curtailed and the ecosystem settled tino a new stable state.

\* \* \*

I am privileged to be an occasional visitor to the world that jellies inhabit and still look at it with the wonder of a teenage boy. Jellyfish show us that we have not come to the end of the age of discovery, and there are innumerable questions to answer. Like Jorge Luis Borges’s in “El Otro Tigre,” I keep looking for the *other* jellyfish. The wild ones prowling the seas become a scientific construct as soon as we try to categorize them. The imaginary ones of literature and public perception are scraps of myth fashioned loosely together. So I persist in searching for the other jellyfish, the indescribable one, the one we can’t capture in words.

**Steven Haddock** grew up in Southern California and has gradually migrated north (Claremont, Santa Barbara, Santa Cruz). He studies the diversity of gelatinous marine animals, and how and why they glow. He has written many scientific papers and two books, including *Practical Computing for Biologists*, with Casey Dunn. Until now, though, he has admired creative writing from afar. He communicates to the public through his Bioluminescence Web page and the [www.jellywatch.org](http://www.jellywatch.org) website.