

Nature of the Unknown

by Ryan Deto

CHILDREN laugh as they slide down green plastic slides and swing on chain-link swing sets at the park sitting above Fletcher Cove in Solana Beach, California. Across a parking lot stands the lifeguard office for the city of Solana Beach, which is perched on top of a twenty-foot-high cliff overlooking the Pacific Ocean. At the bottom of the cliff, dark, dirty sand spreads across two small coves separated by a concrete lookout point. Orange algae covers most of the dirty sand and clumps into piles near the shoreline. Sea gulls rest on top of the piles, seemingly unconcerned by the flies swarming over the dank algae. One- to two-foot swells pound into the sand, chasing a small child up a wood staircase to the comfort of his mother, while large, round pebbles roll in and out of the water with each incoming and outgoing wave. An elderly couple standing shoulder to shoulder look out over the ocean and shiver in the cool shorebound breeze. The sound of the waves crashing into the rocky cliffs, bubbling against the dark sand as they fall back again into the blue ocean seems to calm the visitors of Fletcher Cove. But on the morning of April 25, 2008, the serene atmosphere along the coast changed; less than half a mile north, a wide streak of blood crept up from the shoreline, extended onto the beach, and stained the dark, dirty sand red.

Cars pulled into the Fletcher Cove parking lot around 6:30 a.m. on that Friday morning almost a year ago. Ken and Anita Flagg arrived a few minutes late to the weekly swim for the Triathlon Club of San Diego, but none of the triathletes seemed to mind. The sun was just beginning to rise over the hills to the east, casting a pinkish-

orange light over the cove that extended to the ocean. The day was perfect: a cloudless sky and no wind. David Martin, a 66-year-old retired veterinarian, informed the group that his friend and fellow triathlete would not be joining them because this was the day he had to apply for U.S. citizenship. A newcomer, Laurene Booth, introduced herself to the regular eight: David, Ken, Anita, Alan, Diana, Bob, Ryan, and Andrew. By 6:50 a.m., with all the formalities exhausted, the swimmers entered the water on the concrete slope at bottom of Fletcher Cove; The Flaggs led the pack in, David Martin was in the middle of the pack and entered fourth, and Laurene Booth was right behind Martin. Each swimmer walked into the calm water until it was deep enough to stretch out and swim. The splashes started and increased as each swimmer began to plow through the sea; hands slapped against the water's surface and feet churned up the waves behind them.

A hundred yards offshore, the fish sensed a change in the sea's rhythm. It did not see the woman, nor yet did it smell her. Running within the length of its body were a series of thin canals, filled with mucus and dotted with nerve endings, and these nerves detected vibrations and signaled the brain. The fish turned toward the shore.

-Jaws, Peter Benchley

A black-tipped dorsal fin breaks the water's surface, causing a small, silent wake to trail behind it. The 3-foot-long blacktip reef shark, with its signature sleek, silver body and small black patches on the tips of its pectoral and dorsal fins, glides up to its prospective meal effortlessly, opens its mouth and bites down, ripping flesh with every violent shake of its broad head. Fragments of squid fly out from the shark's mouth and scatter into the tank, spreading their fishy aroma throughout the clear water of Shark Lagoon at the Aquarium of the Pacific in Long Beach. The other sharks in the tank begin

to swim faster, bobbing up to the surface to see if their lunch is ready. A tail fin splashes at the surface as a brown, four-foot sandbar shark grabs its meal and drags it down to the depths of the tank to swallow it whole.

Two o'clock is feeding time for the sharks and rays of Shark Lagoon, and the animals in the tank know it. Kari Olson, a shark aquarist with light brown hair pulled back in a ponytail and a brilliant smile, places her white tennis shoes onto a decontamination mat before trekking behind Shark Lagoon. She and her fellow feeders then position themselves at different posts around the tank, each with different types of dead fish for different sharks. The feeders, sporting comfortable cargo shorts and aquarium staff sweatshirts, use their grabbers to snatch a sharky lunch item and submerge it into the tank. The small, fast sharks, like the blacktip reef sharks, get cut-up squid and small, fish-like sardines. The larger, slower sharks, like the 9-foot nurse sharks, are fed mollusks and crustaceans. Each meal corresponds to the dietary needs and teeth of each fish. The larger sharks are bottom feeders and have grinding teeth to crush shells of their prey and then suck them down their throats. The small sharks are fish hunters and, like the blacktips, have serrated teeth and use violent head thrashes to carve up their prey. Visitors to the aquarium gather around the tank to witness the sharks' grace and aggression while feeding. Children rest on their parents' shoulders as the crowd sighs in awe with each bite.

Kari notices a piece of squid that has fallen to the bottom of the tank and uses a long net to retrieve it. The sharks in the tank, like many sharks in the wild, are picky eaters and each one eats only about 1% of its body weight per day. They are not, contrary to popular belief, indiscriminate eating machines. Sharks eat what they need to keep

themselves going; too little food and they won't have enough energy to get through the day, too much food and they will gain weight and lose the speed they require to hunt. Sharks like, and need, fatty foods; animals filled with loads of fat and covered in blubber. Not ones with lean muscle and bone.

I could have greeted my dear Pacific with uncounted thanks, for now the long supplication of my youth was answered; that serene ocean rolled eastwards from me a thousands leagues of blue.

-Moby Dick, Herman Melville

The Pacific Ocean was warm that Friday morning; the temperature had risen above 60 degrees Fahrenheit for the first time all year. The swimmers welcomed the warm water on their cold muscles and headed out into the sea. The fastest swimmers began to pull ahead of the slower ones, but soon they all regrouped about 200 yards from the shoreline. Then the swimmers started their routine loop; a path starting at Fletcher Cove, then due north about a half mile up the coast to the stone steps at Tide Park, and back down to Fletcher Cove. As the swimmers resumed their swim, the faster triathletes again pulled ahead: Ken Flagg and Alan Silverman, and Anita Flagg, who kept up with the two men, the strongest swimmers in the group, by using flippers. Everyone began to spread out. David Martin and Laurene Booth swam side by side about thirty yards behind the pack leaders; David was to the left of Laurene and she was able to catch glimpses of David's broad-shouldered physique every time she took a breath. Diana Noble, an Ironman triathlete, was just behind David and Laurene, probably about thirty to forty yards back, and the rest of the swimmers followed Diana. About twenty minutes had passed and the sun had begun to brighten the sky. The swimmers stretched out along

a hundred yards of ocean, each swimmer following another, their silhouettes casting shadows on the sea floor.

This was a fish built to feed on all the fishes in the sea, that were so fast and strong and well armed that they had no other enemy. Now he speeded up as he smelled the fresher scent and his blue dorsal fin cut the water.

-The Old Man and the Sea, Ernest Hemingway

Here's what we think happened:¹

The shark swam along the ocean floor about 200 yards out from the coast of Tide Park Beach. Its massive tail swayed and its symmetrical caudal fin propelled its massive, two-ton body effortlessly through the water. At the water's surface, a pack of animals, potential prey, were swimming in small groups. With light coming from above, the dark gray coat of the shark acted as camouflage against the ocean floor. If the animals had been below the shark, its white underbelly would have served as camouflage against the bright sunlight of the surface. The shark sensed each continuing movement the animals made thanks to the small glands on the shark's snout. These glands are known as the ampullae of Lorenzini, and they detect the minute electrical signals given off by muscle movements. Also, every splash made by the animals' limbs caused vibrations in the water, which the shark could *feel* due to highly sensitive, mucus-filled canals on the surface of its skin known as the lateral line. The shark looked up at the animals, seeing only large black silhouettes with its large black eyes. One fairly large animal was slightly separated from the group. The end of the animal was dangling slightly in the water; the shark identified this as a possible injury. The shark instinctively knew the time to attack was now.

Oxygen-rich blood from its gills was fed over the swimming muscles of the shark, warming them, giving the shark high responsiveness even in the cold water. The caudal fin was then shaken vigorously by the gigantic tail, adding immense speed to the shark's trajectory with each powerful stroke. The shark lifted its snout, guiding its body up towards its prey's dangling legs. It opened its mouth, exposing rows of large, serrated teeth and extended its jaws outward to maximize its bite force. The shark had come up so fast that its body rocketed up out of the water as it engulfed the animal's lower half. Flying through the air, the shark's jaws smashed down on the animal with devastating force. As the shark shook its head from side to side, its serrated teeth sliced into mostly bone. Falling back into the water, the shark took another bite. Its teeth scraped down the gangly bottom half of the animal. The prey was then released. Not fatty enough for the shark. Or perhaps it was put off its feed by movement from others in the animal's pack. As the other animals began to swarm around the injured pack-mate, the shark sank back into the bloodied waters.

The boy's last—only—thought was that he had been punched in the stomach. The breath was driven from him in a sudden rush. He had no time to cry out, nor, had he had the time, would he have known what to cry, for he could not see the fish.

-Jaws, Peter Benchley

“SHARK!” The word echoed loudly against the cliff walls. Ken, Anita, and Alan had reached the turn around point and looked up to see David waving his arms in and out of the water. Laurene turned toward David. The shark's dorsal fin slid silently between them. Laurene swam up to David. He was floating on his back, blood gushing from his massive leg wounds. Laurene struggled to keep David afloat, but Ken, Alan, Anita, and

Diana quickly arrived at David's side. Ken told Anita to go to the beach for help. She swam off with Laurene close behind. Ken, Alan, Ryan, and Andrew pulled David toward the shore.

He is still alive. After less than five minutes they reached the beach, where a lifeguard was already driving up. As David lay on the beach, blood seeped into the sand. A few minutes passed. David lost consciousness. The ambulance crew arrived and they attempted to resuscitate David. Ken, Anita, Alan, and the other swimmers waited for news. The arteries in both his legs had been severed in the attack, and at 7:49 a.m. on April 25, 2008 David Martin bled to death on Tide Park beach.

For days he has dumped a trail of tuna blood into the ocean so that a great white shark might be lured, so that we might touch its fin. The power of the primitive is parallaxic.

-The Great White Shark, Arthur Sze

To understand a white shark attack, we must look at more than one point of view. The human view is tragedy; a deadly animal committed an unprovoked attack on an innocent person. David Martin's death was sudden and heartbreaking. A grandfather, a friend, an athlete was taken by the awesome power of nature, which seldom touches man in such dramatic ways. A man who committed his life to helping animals as a veterinarian had been killed by the very thing he strove to help. Tragedy in this situation is unavoidable. Tragedy usually leads to sorrow, but sometimes it can lead to anger.

The shark has become an enemy. News articles, television reports, and even films portray the shark as a vicious, indiscriminate hunter. Over the years people have begun to discover the reasons why the attacks happen, but neglect to understand the shark, and

thus become angry. To calm this anger, we must look at the other point of view; the view of the shark as a being of nature.

When white sharks attack humans, they are merely doing what they have done for millions of years: hunting. They are following their instincts. The shark that sealed David Martin's fate just happened to be in the area, maybe for giving birth or maybe just passing by. White sharks are not territorial and in fact are notorious travelers. One shark was tagged off the coast of South Africa and then tracked to Australia and back within a year. The shark that killed Martin investigated the swimmers because its senses picked up their splashing. From the shark's point of view, constant splashing at the water's surface usually means an animal in distress and an opportunity for an easier-than-normal meal. So the shark investigated the splashing and saw a group of large, slow-moving animals (humans only swim around two to three miles per hour).

When the shark looked up at humans' fairly large bodies, it saw only dark silhouettes with barely distinguishable shapes. To a shark, a silhouetted human looks much like a silhouetted seal or sea lion. White sharks' vision, while good in comparison to other marine animals, is still poor because it is underwater vision. Light travels far less distance in water than in air, so even fish that have evolved for millions of years underwater are not sharp-sighted.

After locating potential prey, a white shark may choose to attack, or may not. White sharks, like other sharks, only feed when they need to. When white sharks hunt they do so instinctively; stalking their prey in the shadowy depths, then moving with a single fast, hard-hitting jolt and concluding with a devastating bite. If the shark is happy with its prey, it will let go of it, circle it, waiting for it to die so as to avoid any conflict or

injury during consumption. If the shark is dissatisfied with its victim, it will abandon the prey and not waste any more valuable energy.

The white shark is the largest predatory fish on the planet, and being so requires massive amounts of energy. It is not clear how much food white sharks need during a given day, but we can figure that their diet must consist of animals that are rich in fat and blubber, like seals and porpoises, to correspond to their high energy requirements.

Humans might initially look like a good meal to the shark, but are comparatively low in fat and have no blubber. Humans are not really on the white shark's diet, but every time we step into the ocean we are venturing into the white shark's hunting grounds. Because the beach is thought of as a tranquil recreation spot, people forget about the shark and its possible dangers.

Ignorance of sharks is not only reserved for beachgoers, however. Scientists will tell you that sharks as a species have been widely under-researched; the same is true for most marine species. Because of the lack of research, protection for the shark is hard to come by. Only sharks classified as endangered species are protected and luckily, the white shark is now protected. This, however, only came about because of the massive fishing for shark that coincided with the release of the 1975 film *Jaws*.

Without protection, many shark species can become threatened relatively easy. Most shark species are known as apex predators, or top-of-the-food-chain hunters. We have learned from studying evolution that apex predators usually have long gestation periods. Additionally, the job of an apex predator is to moderate the prey animals in its ecosystem by hunting them. In order to achieve a balance between predator and prey, predators (who hunt and kill many prey animals in their lifetimes) give birth far less often

than prey animals because prey animals must replenish their population as a result of being constantly hunted. In short, sharks birth infrequently and usually to few pups.

Therefore, when humans fish for sharks, the results are far more detrimental to the shark population than fishing for a prey fish like sardines is to the sardine population.

The destruction of sharks is also devastating for ocean ecosystems as a whole. Most sharks, being apex predators, are what are known as keystone species. This means that sharks affect the population of every species in their ecosystems, either directly or indirectly. In layman's terms, white sharks eat sea lions, sea lions eat squid, squid eat krill, and krill eat phytoplankton. If there were fewer white sharks, then there would be more sea lions, which would result in fewer squid and more krill and so on . Without sharks, the entire balance of the ocean could go out of whack.

The shark-human relationship is drenched in fear. Sharks occupy a realm alien to humans, the ocean. We step into their world for brief moments and most of the time come out unharmed. Rarely, a human will be attacked by a shark, and the attack comes as a vicious surprise not only to the victim, but also to the victim's community. The way the attack happens -- not just the attack itself -- scares us too. It is stealthy: victims never see the shark until it is upon them, and then the shark leaves within seconds of the attack. We are not afraid so much of the animals themselves as we are of their mysterious nature. Fear of the unknown drives us to persecute the shark. Instead of persecuting them, we should be studying them. In gaining an understanding, the unknown becomes the known, the uncontrollable becomes the controllable, and our fear disappears.

The shadow of sharks is the shadow of death, and they call forth dim ultimate fears. Yet there is something holy in their silence.

-*Blue Meridian*, Peter Matthiessen

The shark escaped the blood-red water and the pack of animals that had gathered around its victim. The taste and feel of the animal was different from anything the shark had ever bitten before. Instinct told the shark to leave the situation. With mighty strokes of its colossal tail, the caudal fin propelled the shark through the sea. Maybe it swam north towards the Farallon Islands west of San Francisco, maybe south towards the fur seal colonies of Guadalupe Island west of Baja California, or maybe into the deep ocean and the infinite, dark abyss.

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ⁱ Information for this portion of the story was gathered from an interview with Dr. Richard Rosenblatt of the Scripps Institute of Oceanography at UC San Diego, and a journal entry by swimmer Ken Flagg from April 26, 2008