

CURRENTS OF DECEIT

Ronald Perkins

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**CHAPTER 1: TAINTED BOUNTY FROM THE SEA,
AUGUST 2009**

It was a Sunday, and morning showers had given way to azure skies and a bright sun that demanded sunglasses. A stiff easterly wind softened the heat of the summer sun in the protected marina of Key West. Moored boats bobbed up and down from the wake of each passing boat as it returned from its fishing run to the Gulf Stream a few miles offshore. As usual, an admiring crowd of tourists had gathered to watch the boat captains maneuver their crafts into assigned boat slips with precious little space to spare.

Fishmongers were busily preparing open-air tables soon to be piled high with the sea's most recent offerings. The smell of fresh fish permeated the air as the crews began to unload their bounty to the delight of tourists and local customers who milled about the marina. Young and old alike watched with anticipation as deck hands reached deep into the ice chests to grapple fish and heave them onto the dock to the delight of everyone. It was not by accident that each fish retrieved from the chest was increasingly larger and larger until the bottom of the barrel, so to speak, was reached. Such a contrived ritual was good for the charter boat business and was an event that never seemed to disappoint.

Local fish merchants were busy cleaning fresh fish and icing them down on the spot. The selection of fish was extensive

and ranged from snappers and grunts caught in shallow shelf waters to swordfish, tuna, and mahi mahi taken further offshore in the Gulf Stream. In the midst of the fish market were scattered booths set up by local street vendors hawking colorful Key West fabrics, handmade jewelry, seashells of all sorts, and woodcrafts and paintings from the Caribbean.

Scott Simmons, a marine biologist with the Florida Fisheries Commission, threaded his way through the crowd stopping periodically to examine freshly caught fish piled high on the vendors' tables. He was making his weekly rounds to examine fish for potentially harmful parasites that would render the fish unfit for human consumption and to collect samples for further microscopic analysis back at his lab. Most people weren't aware of the possibility of such infestation, and those who were knew that a thoroughly cooked fish posed no danger. Sushi, on the other hand, was another matter.

Scott looked very much a "Conch", as the Key West natives often referred to themselves, although actually he was from a small rural town in Indiana. He had first visited Key West on spring break while an undergraduate student at Indiana University and was hooked. His first snorkeling experience on the reefs off Key West so enthralled Scott that he decided then and there that he would pursue a career in marine biology. After graduation, Scott attended Diver's Training Academy in Fort Lauderdale and became a certified scuba instructor and completed a more rigorous course in shallow-water commercial diving. He worked as an instructor for a few years at several of

the PADI certified schools in South Florida before entering graduate school at the University of Miami where he focused his doctoral research on the effects of over-fishing on the reef community.

Scott had received his doctoral degree the previous summer, but at that time he was unable to land an academic position that would allow him to pursue his love of tropical fish ecology. As luck would have it, a position opened with the Florida Fisheries Commission in Key West and Scott jumped at the chance to apply. It was not the academic career that he had hoped for, but for now he was content to pursue his research interests and hope that an academic position might eventually come his way.

Scott shuffled along in well-worn floppy sandals, his bright, floral-patterned shirt hanging out over his cutoff jeans. His good looks were striking. Scott was tall, lean and muscular, deeply tanned, with hair bleached blond by far too much time in the sun. He looked considerably younger than his thirty-five years and attracted the admiring glances of many of the women who milled about the dock. In the vernacular of the day, Scott would be considered a real “hunk”.

“Damn it, Scott! Gimme a break! That’s twice this month you’ve singled me out. It looks bad for business,” said one of the vendors.

“Just doing my job, Jimmy. Nothing personal.”

Scott’s presence was an irritant to the local fishermen, as he was empowered to stop the sale of fish he deemed spoiled or

contaminated in any way. Normally Scott would spend most of his time taking samples from shallow-water species of fish, but today he decided to focus more on the open-water Gulf Stream catches for he had not done so for several months. Scott gathered samples of swordfish, yellowfin tuna, and king mackerel from a random selection of vendors. Scott was aware that these pelagic fishes usually have very low levels of parasites because they roam extensively and generally do not remain in an area long enough to ingest significant numbers of parasites from their prey. However, there had been reported occurrences of roundworms in yellowfin tuna that resulted in human infestation after being eaten raw. Although Scott did not anticipate finding any significant parasite infestation in his samples, it was his responsibility to periodically check fresh fish sold in the market.

Scott returned to his battered 1970 Ford pickup truck, which had been ravaged by years of saltwater spray and the high humidity of the Florida Keys. The truck rumbled out of the parking lot as Scott headed for his lab on Sugarloaf Key.

Although it was Sunday, he didn't want to put off the chore of analyzing the samples because he had made other plans for Monday. Those plans centered on Linda Stevens, a marine biochemist that Scott had met a few months earlier at a weekend party at Hemingway's old watering hole, Sloppy Joe's Bar in Key West. While sitting at the bar and getting acquainted for the first time, they were interrupted by a drunken pilot from the Key West Naval Air Station who began hitting on Linda. Despite her attempts to rebuff him, he continued until Scott intervened and

shoved him away from the bar. A minor scuffle ensued and the barkeep asked them to take it outside.

“We were about to leave anyway,” said Linda. “Let's go!”

The two began to thread their way through the crowded bar towards the door. The boorish pilot was a persistent lout and followed them outside. Scott felt a hand firmly grab his shoulder from behind and he whirled around with his fists clenched and his right arm cocked for a fight. Before Scott could do anything, Linda inserted herself between the two men and in rapid succession let go with powerful forearm blow to the pilot's head and a swift kick to his groin. He grimaced and dropped to his knees, clutching his crotch and toppled to the ground in agony.

“Damn!” exclaimed Scott. “I didn't see that coming.... I guess he didn't either. When did you....”

Linda interrupted, “That isn't the first time that I've been hassled, so I decided a long time ago to do something about it... a second degree black belt in Taekwondo and working on a third. I won't put up with that sort of bullshit ever again.”

Scott found himself strangely attracted by her physically aggressive behavior, but knew then and there that he would never want to seriously piss her off. Their relationship blossomed within a few weeks and soon they shared a small bungalow on the western shore of Big Pine Key.

Scott had promised Linda a trip to Rock Key Reef on Monday so that they could collect samples of living coral tissue for Linda's research project. Linda, who had received her

undergraduate degree in biology at Ashmore University, was now a doctoral student at the University of Miami. Linda's doctoral research focused on the demise of coral reefs that had begun in the early 1990s and persisted today. Previously unknown forms of infestation that were especially devastating to the reef corals had appeared within the past year. Linda hoped that her studies might find the cause and possibly the cure for this new ecological threat. There was considerable controversy over what was causing this die-off of corals. Some believed it was a natural phenomenon that periodically infested the reef; others were convinced it was the activities of man and his impact on the environment. Linda was also working closely with the coral reef restoration project that had been having some success transplanting sprouts of staghorn and moosehorn corals in an attempt to repopulate distressed and devastated reef sites.

The aging truck shuddered to a halt in front of the converted government Quonset hut that served as Scott's lab. Linda, dressed in a brightly colored Androsian fabric dress that she had purchased in the Bahamas, was waiting for Scott on the wooden steps outside the lab. She cradled her head in her hands with her elbows resting on her knees, her long black hair flowing in the stiff breeze. Hidden beneath her wrap-around sunglasses were sparkling blue eyes filled with anger. Scott could see the scowl on her face as he opened the truck door and slid off the seat.

“Damn it, Scott. You said you would be here an hour ago. I was just about to leave!”

“Sorry, babe.”

“I’m not your babe! You know how I hate to be called that,” fired back Linda.

Scott knew he was in trouble if he didn’t calm the waters before Linda unleashed the emotional storm that was brewing.

“I couldn’t help it. The market was flooded with tourists. I had to fight the crowds just to get my samples. I told you I was sorry,” said Scott as he lowered his head, much as would a scolded puppy. After a few moments of silence, Scott felt it was safe to continue.

“I had a good day, though. Got all the samples I needed for analysis and wasn’t hassled too much by the locals,” said Scott as he reached out and unlocked the lab door for Linda, who was still simmering.

Once inside, the cool blast of air from the ancient air-conditioner seemed to pacify Linda and put her in a better frame of mind. The lab was well equipped with all the analytical instrumentation needed to perform precise analyses of biological samples. Scott began preparing tissue samples for microscopic examination for parasites and/or lesions that might affect the suitability of the fish for human consumption.

Linda, being the curious scientist that she was, decided to do something worthwhile with her time while she waited for Scott. Besides, she wanted to hone her skills on the new gas chromatograph that Scott had recently acquired for identifying organic compounds. Linda, a biochemist by training and interest, decided to prepare extracts from the samples for analysis.

“Scott, I think I am going to look for POPs with your new equipment.”

“POPs? What the hell are POPs?”

“POPs is the acronym for Persistent Organic Pollutants,” replied Linda. “POPs include PCBs (polychlorinated biphenyls), dioxins, and pesticides such as DDT and chlordane that don’t degrade rapidly and don’t stay put. They can be carried thousands of miles by air and water currents. The biggest danger they pose is that they concentrate through bioaccumulation and biomagnification.”

“Refresh my memory. What’s the difference?”

“Bioaccumulation refers to an increase in the concentration of a chemical in an organism compared to its concentration in the surrounding environment. If the concentration increases faster than the organism can metabolize or excrete the chemical, it begins to accumulate in body tissue or an organ. The problem comes when organisms are subjected to man-made pollutants that cannot be completely metabolized or expelled, so they remain in the organism. Biomagnification, on the other hand, occurs when these pollutants are transferred successively from one link to another upwards in the food chain. So the larger fish near the top of the food chain end up with the highest concentration of pollutants. When it comes to fish, the top of the line predators include shark, swordfish, king mackerel, and certain species of very large tuna.”

“Where’s your blender?”

“Over there in the corner.”

Linda took several slivers of fish, ground each of them in the blender, and prepared extracts for analysis. As Scott continued his analysis of tissue samples, he was impressed by the high quality of the fish that he had collected. He was about to tell Linda that he had detected no parasites in the samples and was finished with his work, when Linda made a startling discovery on the samples that she was running.

“Oh, my God!” blurted out Linda. “Check out these charts. All these extracts have the same distinctive pattern. Look how strong the peaks are. I’ve double-checked the results with the reference chart for known toxins. I’m sure we’re reading elevated levels of PCBs!”

“How can you be sure?” asked Scott as he scanned the strip charts. “I picked up a few traces of PCBs a few years ago on the old chromatograph, maybe two or three parts per million, but nothing that comes anywhere close to these amounts. These concentrations are at least twenty parts per million! Run the samples again just to play it safe.”

Linda ran the samples again and confirmed the high concentration of PCBs.

“While we’re at it, why don’t we run the inorganics as well?”

“Why? Aren’t PCBs enough bad news for the day?”

“Just humor me,” said Linda. “Does your ICP still work?” referring to the old ICP/MS (inductively coupled plasma mass spectrometer) tucked away in the corner.

“It worked fine the last time we used it,” answered Scott.

“I’m going to target mercury because we know it’s a harmful toxin when it comes to human health,” said Linda as she prepared the sample for analysis.

Scott continued to busy himself for the next couple of hours with government paperwork while Linda prepared and ran the samples. Her results were startling.

“The FDA has set a maximum permissible level of one part of methylmercury in a million parts of seafood. Just look at these numbers... ten parts per million! These samples have dangerously high concentrations of PCBs, methylmercury, and who knows what the hell else!”

Scott was stunned by the test results and wondered what they should do next. Assuming the analyses were accurate, where were the toxins coming from and how were they getting into the fish?

“We’ve got to get a handle on this,” said Scott. “We need to know whether the fish are accumulating toxins directly from waters off the Florida Keys or if they are being contaminated somewhere else and migrating here. When we go to your study site tomorrow let’s collect some water and plankton samples from the Gulf Stream.”

Linda agreed, and soon they began organizing the analytical supplies and field equipment that they would need for tomorrow's expedition. Everything was packed in waterproof containers and loaded on the truck. After a few failed attempts to start the pickup, it finally obliged, and they were off in a cloud of dust.

As they drove along the gravel road back to their bayside retreat on Big Pine Cay, the discussion turned to PCBs and their effects on organisms. Linda was quite knowledgeable about PCBs and their health effects as she had written a research paper on the subject the previous semester in a course entitled “Toxins in the Environment”.

“You know... if it is PCB contamination,” she said very deliberately, “we have a real problem. PCBs are widespread in aquatic environments and have been found as airborne contaminants. Every organism that has been analyzed for PCBs from both the North and the South Atlantic has shown small traces, even the bottom dwellers at eleven hundred feet. When humans eat contaminated fish, bad things can happen: endocrine disruption, skin disorders, neurobehavioral and immunological changes in children, and cancer in animals. Most government agencies that have studied PCBs have concluded that they are probably carcinogenic to humans. They’re hard as hell to get rid of too! The problem is that PCB mixtures are relatively insoluble in water and don’t degrade at temperatures found in the ocean or at the earth’s surface. Even if you heat them to three thousand degrees Fahrenheit, the residual ash that remains is still toxic. There has been some success using chemicals and bacteria to clean them up, but there is still a lot of stuff out there that hasn’t been treated and poses a very real threat.”

“I thought they stopped using PCBs in electrical transformers years ago.”

“They did,” said Linda, “but they were also used in plastic parts that needed to be heat resistant, like televisions and radios. Some were used in inks and dyes, in pesticides, in adhesives, and even coatings for wood.”

“What about mercury?” asked Scott.

“Even worse,” said Linda. “The problem is that mercury can combine with carbon to make organic mercury compounds. The most common one is methylmercury that is formed from inorganic mercury by the activity of anaerobic organisms that live in aquatic systems and that includes the ocean. Because it takes a lot longer for methylmercury to break down in salt water, marine fish are more of a hazard than fish caught in fresh water. Mercury may cause damage to the brain, kidneys, and a developing fetus. The government Agency for Toxic Substances and Disease Registry (ATSDR) has created a list of the top twenty hazardous substances. Mercury and PCBs are in the top five!”

That evening they continued their discussion, playing out possible scenarios of what they would and wouldn't do if they should find traces of toxins in their sample collections tomorrow. It had been an exhausting day, even more so than usual because of the stress induced by their potentially disastrous discovery. They went to bed early that evening in anticipation of rising with the sun, but neither slept well.