Chapter Thirty-Three

On Monday morning, her first day of work, Prairie Wind and Sasha had a cup of coffee together in the dining hall, then they walked to his office on the second floor in the Agassiz building, where his two open windows looked out onto Monterey Bay and caught the morning sunshine. Sasha sat behind his desk, from which he had removed all books and papers so that the broad mahogany desktop did not appear cluttered. At the left end of the big desk, a laptop stood open with its dark screen facing Prairie Wind's chair, which stood directly in front of the desk.

Sasha watched Prairie Wind as she set up her video camera on a tripod that stood behind and slightly to the right of her chair. Both were silent while she looked through the camera and focused on his face.

She zoomed in for a close portrait, with his books on shelves in the background. Just above his right shoulder, perched on a stack of journals, a stuffed toy sea otter lay on its stomach looking out at the camera.

She clicked on the auto-focus, so that if Sasha moved forward or backward in his chair, the camera would keep his image sharp.

"All right," she said, turning her attention to the microphones. Carefully uncoiling one cord, she reached across the right end of Sasha's desk and handed him a small microphone. "Just clip that to your shirt below the collar, please."

He fastened the microphone to his shirt, then he asked, "Is this correct?"

She put on the headphones. "Go ahead and say something. I'll check the volume." She again looked through the camera.

He sat up straight with his hands folded in front of him on his desk, stared into the camera and said, "I was reading last night about the Lakota Sioux on the Rosebud Reservation in South Dakota. Very interesting people."

Then he stopped and waited.

"Perfect volume," she said. "Now let me check my mike."

She clipped on her microphone, then said, "Thank you for reading about the Lakota Sioux. Perhaps, one day, we can have a good long talk about our backgrounds."

He said, as she heard clearly in her headphones, "I greatly look forward to learning much more about the Lakota Sioux."

"Perfect," she said. "We are ready."

Keeping her headphones on—she wanted to hear both voices through the entire interview, to be sure that both were strong and clear, with no problems whatsoever—she sat in her chair, six feet from Sasha. With his white hair and faded blue denim shirt, and his hands folded on the desk, he looked as if she had just stepped off a research ship and was ready to tell the tale of his voyage.

Prairie Wind began with a prepared opening, "Good morning, Sasha. We are here at the Pacific Marine Research Center on Monterey Bay on Monday, May 25, 2009. Perhaps you would like to introduce yourself."

He nodded and leaned slightly toward the camera. "Good morning, Prairie Wind. I am very glad that you have come to visit us at the Research Center. I hope that we shall have a long and probing discussion."

He paused, then he smiled. His blue eyes, lit by the light from the windows, filled with warm friendship as he said, "I am Alexander Maximovitch Mikhailyukov, but you may call me Sasha. I am a professor of marine biology here at the Pacific Marine Research Center, which was established beside Monterey Bay in 1892 as part of Stanford University. I would like to talk with you today about the kelp forest that grows along our California coast."

He picked up a remote on his desk and pointed it at the laptop as he pressed a button with his thumb. The screen lit with a picture of a seal swimming through a luxuriant kelp forest.

"Here we see a harbor seal, one of our neighbors, swimming through a forest of giant kelp, *Macrocystis pyrifera*, which grows along the Pacific coastline of North America from Baja California in Mexico . . . to southeast Alaska. This long thin forest supports a ribbon of abundant life. Roughly thirty different species of kelp grow along approximately twenty-five percent of the world's coastlines, making the kelp forest one of the most productive habitats on the planet."

The laptop screen was not within the range of the camera frame, but that was all right. Sasha would later transfer his pictures to a memory stick for Prairie Wind, so that she could archive the pictures with the video.

"You can see in this picture that the kelp consists of a long thin stem, almost like the stem of a corn stalk, lined with yellow-brown blades up to half a meter long, flapping like slender pointed pennants in the ocean current. The kelp grows far enough out from shore that it is beyond the breaking of all but occasional storm waves, in depths from six meters to over thirty meters. Kelp is actually a giant form of algae, so it does not have roots, but rather what we call a 'holdfast', which

clings to the solid rock on the bottom. Kelp can grow all the way up to the surface, where the upper portion forms a mat of stems and blades."

Sasha paused for a moment, then added, "You can see, where the blades meet the stem—which we call the 'stipe'—a little round bulb. This bulb is filled with a gas produced by the kelp. The many buoyant bulbs lift the entire plant upwards toward the surface. You have told me, Prairie Wind, that you have swum through a kelp forest while breathing with a scuba tank, so you know that the kelp sway back and forth with the surge from the rolling surface, with plenty of room between the plants for you—or for seals and otters and fish—to swim between them. As we can comfortably hike through an old growth pine forest, so we can comfortably swim through a kelp forest. But," he smiled, "the kelp forest is far more graceful, always in motion."

Sasha held his arms out and swayed gracefully back and forth in the surge.

Then he held up a finger as he made an important point. "Keep in mind that kelp needs cold water. It lives where the coastal edge of the ocean ranges in temperature between six and fourteen degrees Celsius . . . or for those rather backward Americans in the audience, between forty-three and fifty-seven degrees Fahrenheit. Further, because the holdfast, unlike roots, does not absorb nutrients, kelp needs nutrient-rich water from which it absorbs various minerals and chemicals."

Sasha clicked onto the laptop screen a map of the world, showing with stripes and horseshoes of green where kelp grows along the continental shorelines. Prairie Wind looked at the green stripe along the Pacific coast of North America: yes, it reached from the long peninsula of Baja California to the south . . . up past California to Alaska in the north . . . where it curved to the west and followed the Aleutian Islands far into the northern Pacific Ocean.

Sasha continued, "Notice the absence of kelp below Baja California, where the water along the coast of Mexico and Central America is too warm for kelp to grow. But further south, along the coastline of Peru and Chile, we again see the green stripe of kelp, flourishing in the cold water. The stripe also follows the cold Atlantic coastlines of Argentina and Uruguay, but then vanishes when it reaches the warm waters of Brazil.

"In that warm-water gap, the long slender sanctuary of kelp where so much life flourishes . . . is replaced by the sanctuaries of coral reefs and mangroves,

where other forms of life flourish. You will talk later with my colleagues who prefer the lovely warm water of the coral reefs, and I can't say that I blame them."

He paused, studied the map for a moment, then he continued, "If we take a quick tour around the world, we see here in the northwest Atlantic an enormous kelp forest reaching far into the ocean beyond the coastlines of Maine and eastern Canada. That was the home of the fabled cod fisheries, before we fools fished the cod to commercial extinction after World War Two.

"Moving east across the Atlantic, we see that a broad swath of kelp follows the western coasts of Scotland, England and Wales, wraps entirely around the island of Ireland, then continues south along the coastlines of France, Spain and Portugal. Another forest of kelp follows the long coastline of Norway from the southwest corner of the country at the bottom . . . to above the Arctic Circle at the top. Now moving far to the south, we see a forest of kelp wrapped like a horseshoe around the bottom of the African continent.

"Further to the east but at the same southern latitude, a kelp forest grows in the cold waters along the curving western coast of Australia, around the entire island of Tasmania, and along the southern and easternmost coastlines of New Zealand.

"Moving north across a stretch of warm water along the eastern coast of Asia, we see that a kelp forest grows in the cold waters off the eastern coast of Japan. The kelp continues north into Russian waters: it wraps around the peninsula of Kamchatka, and reaches to the furthest northeastern point of Siberia.

"As I mentioned earlier, various species of kelp live along about twenty-five percent of the world's oceanic coastlines, wherever the water is sufficiently cold. These long slender forests provide a vast habitat for a greater range of life—snails, abalones, mussels, crabs, lobsters, octopus, the full spectrum of fish, otters, seals, and even whales—than we could ever find in a terrestrial forest. Beneath the floating mat of kelp on the surface, life is thriving as it thrives in few other places on the planet."

Sasha paused—a good long pause which Claire had told Prairie Wind to anticipate—and then he said, looking at her with his gentle eyes, "Prairie Wind, a long time ago, your early ancestors traveled from northeastern Asia to northwestern America, and then they headed south and settled in many different places across two enormous continents. Some of them settled on the rolling plains where vast herds of buffalo thundered across the prairies."

"That's right," she said, her first words during the interview. "We came from Asia and settled in America."

"For a long time, archeologists believed that your ancestors walked across a 'land bridge' which formed between Siberia and Alaska toward the end of the last ice age, when so much water was captured in the form of ice that sea levels were lower than they are today. The lower sea level revealed the rocky bottom of the shallow sea between Asia and America, and thus people were able to walk toward an unexplored world which offered perhaps better hunting, or less conflict with aggressive neighbors.

"But there were problems with this theory about the land bridge. It was a very long walk across rough terrain, with probably not much food along the way. People were likely to starve to death, or freeze to death, before they reached the sunny shores of California.

"Then in October of 2007, Jon Erlandson at the University of Oregon, working in the Department of Anthropology, published a paper which supported a different theory. Because he and his colleagues lived near the Oregon shoreline, they knew about the kelp forest that stretched far to the north and far to the south. What if, about 16,000 years ago, people living along the northeast coastline of Asia had developed a maritime culture, primarily as fishermen? They would be able to paddle, or perhaps sail, north and then east along the coastline in the protected water between the kelp forest and the shore. The kelp broke the force of most of the waves, *and* provided abundant food along the entire voyage. People could camp and sleep on shore, but most of the time they would be in the safe and fairly comfortable world which they knew well: aboard their boats. They might sail north in a fleet of a hundred boats, or a thousand boats. They could never get lost, and whenever a storm churned up the sea, they could pull their boats ashore, set up shelters made of animal hides, and wait for better weather.

"Eventually, after they had traveled far enough north, and then far enough east, they traveled far enough south that the coast along the sea became increasingly inviting. The weather became warmer. The snow melted during long sunny summers. Rivers poured fresh water into the sea. And of course, people who followed after the initial pioneers needed only to sail a bit further to find their own patch of land."

Sasha paused, then summarized, “This historic migration was possible because of the ‘kelp highway’, as Jon Erlandson called it. Why trudge across barren, frozen land, when you could paddle across a sea bountiful with food?” [1]

Prairie Wind had never before encountered this theory about a kelp highway, but she heard her uncle’s voice as he said so often, “Why walk when you can ride a horse?”

“Well,” said Sasha, “perhaps it’s time for a break, now that we have explored the importance of kelp. And before we launch into a bit of recent history.”

“Thank you, Sasha. When we look out the car window as we drive along the coastal highway at the mats of kelp floating on the surface, fifty meters out from shore, we have no idea that such an extraordinary world is hidden down below.”

“Prairie Wind, I’m sorry to say that we won’t really pay much attention . . . until those kelp forests are gone.”

* * * * *