The Dinosaurs Among Us

The moon had not yet risen, so the only visible light came from the twinkling of bioluminescence[i] in the ocean waves, and the occasional flash of heat lightning in the distant horizon. Other than that, our group of research assistants was enveloped in darkness; the sky, water, sand and vegetation were nearly impossible to tell apart during the first ten minutes of walking along the shore. Our eyes began to adjust just in time for us to notice a vague trail that resembled tire tracks, cutting from the ocean on to the beach, about six yards in front of us. We halted, hushed our voices, and strained our eyes to get a better look. I turned my head and, using my peripheral vision[ii], spotted a round, moving mass at the end of the tracks.

It was a female Olive Ridley (*Lepidochelys olivacea)* sea turtle, which had emerged from the sea and was beginning to nest here on a Pacific beach of the southern Nicoya Peninsula, Costa Rica. We crept up behind her and quietly watched her dig an impossibly deep hole, about 35 centimeters into the sand, using her dexterous rear flippers. As she began depositing her eggs, she went into a trance-like state, concentrating hard on the task at hand. Because of this, she hardly noticed as we dug a canal to her egg chamber and caught them as they fell, counting each one as we transferred it to a drawstring bag—in total she laid 91 eggs (which resemble Ping-Pong balls, but with a leathery texture). While she covered with sand what she believed was a full nest, we collected the rest of our biological data: the length and width of her top shell, or carapace, the depth of her nest, the identification numbers of the tags on her flippers. Once the hole was filled, she began her Olive Ridley "dance"[iii], moving her body side to side, using her back flippers and bottom shell to pack down the sand. Lastly, she sprayed sand over the nest with her front flippers as camouflage, and began an arduous, slow walk back to the ocean.

It is a marvelously strange feeling to be present for such an intimate and important event as a mother sea turtle nesting. Listening to her deep grunts and sighs, and watching the tears[iv] in her eyes as she goes through this ancient, instinctual, extremely energy-intensive process, makes one feel a bit like she or he is watching an alien event, or is, in fact, an alien coming here to watch an earthy event. After all, these turtles have been living here more than one hundred million years longer than us. So why *were* we there, stealing that poor creature's eggs, anyway?

From the view of a bystander, our work can easily be mistaken for poaching. In reality, illegal harvesting of turtle eggs is exactly what we are here in Costa Rica to protect against. We transfer most clutches of eggs to a hatchery where we rebury them out of harm's way. Then we monitor them until they hatch to make sure the baby turtles, commonly called *tortuguitas* in Spanish, make it safely to the ocean.

All 7 species of sea turtles, even those in the mid-Atlantic (yes, there are sea turtles swimming off of New Jersey's coast!) face many direct and indirect threats. These

include coastline development on their nesting grounds, industrial fishing and poaching, as well as ocean pollution and climate change. With all the research, campaigns, and education initiatives going on around the world, there is hope. There is hope that these endearingly cute (think *Finding Nemo*) symbols of wisdom from the dinosaur age can survive not only an ice age, but also the environmental destruction caused by humans in our current epoch, now being called the Anthropocene[v] by some. With the important roles sea turtles play in oceanic ecosystems, which include maintaining sea grass beds, coral reefs, dune vegetation and more, we cannot afford to lose them.

As the nesting season quickly moves into full swing, I will be sharing adventure stories and photographs about the work being done here at PRETOMA (Programa Restauracion de Tiburones y Tortugas Marinas), and the affiliated company Turtle Trax S.A., as we work to develop sound conservation measures for our ocean ecosystems.

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[1] *Bioluminescence is light produced and emitted by a living organism through chemical reactions. In this case, it was created by dinoflagellates, a type of miniscule, single-celled marine plankton that form the basis of aquatic food webs and sometimes visibly glow when in large enough concentrations. This is thought to deter predators.*

[ii] *Peripheral vision is better for seeing at night because we use our rods, which are found at the extremes of our eyes and are better at detecting light, versus our cones, which are found in the center of our eyes and are better at detecting color.*

[iii] *Olive Ridleys are smaller and lighter than other species of sea turtle, weighing from 79 to 95 pounds and their shells growing from 55 to 76 centimeters in length. Therefore, they need to use their full body masses to pack down their nests.*

[iv] *Turtle tears are produced by salt-excreting glands in their eyes. In the Amazon rainforest, butterflies have been observed flocking to yellow-spotted river turtles for a sip of sodium water.*

[v] *Although we are officially in the Holocene epoch according to the International Union of Geological Sciences, many experts are using the term Anthropocene instead, to refer to a new epoch where humans are rapidly causing mass extinctions and altering the atmosphere.*