

Our Ocean Backyard — *Santa Cruz Sentinel* columns by Gary Griggs, Distinguished Professor of Earth and Planetary Sciences, UC Santa Cruz.

**#240 July 9, 2017
Shoreline Mysteries**



Aerial photograph of Santa Cruz Main Beach

“The good thing about science is that it’s true whether or not you believe it” – Neil deGrasse Tyson.

Having spent 56 years of my own life involved with science, this simple quote captures a lot and is particularly appropriate at this time.

There have been times in the past when scientists in various disciplines believed that everything important in their fields had already been discovered, that all the major research could be halted because we knew everything but the details.

Perhaps the best example was a quote that has often been attributed to Lord Kelvin who supposedly said this around 1900: “There is nothing new to be discovered in physics now. All that remains is more and more precise measurement.”

Simon Newcomb, an early Canadian/American astronomer, stated in 1888: “We are probably nearing the limit of all we can know about astronomy”. With all due respect to both men, they were quite unaware of what discoveries were yet to come.

An interesting contrast was written by Dr. Lewis Thomas, the poet-philosopher of medicine who was president of the Sloan-Kettering Cancer Center and dean of the medical schools of New York University and Yale: “In real life, every field of science is incomplete, and most of them – whatever the record of accomplishment during the last 200 years – are still in their very earliest stages.”

Lewis Thomas also wrote “On any Tuesday morning, if asked, a good working scientist will tell you with some self-satisfaction that the affairs of his field are nicely in order, that things are finally looking clear and making sense, and all is well. But come back again on another Tuesday, and the roof may have just fallen in on his life’s work”.

One does not have to be a scientist to realize and appreciate that whether we look at the last century or the last decade, there are countless new discoveries and

developments that have changed our entire understanding of the world, of life on the planet, and how we live: particle physics, radiometric dating, genomics, plate tectonics, personal computers and the internet, semi-conductors and cell phones, to name a few.

Thomas' statement that all fields of science are still in their infancy should be encouragement indeed for all of those young people who are excited by and considering careers in science. We don't yet know what we don't know should be a catalyst for all budding scientists.

While there are no doubt many global scale problems and unknowns, there is also no shortage of local uncertainties and mysteries, at least there are to me, right here in our own ocean backyard.

I thought it would be interesting, challenging, and fun to present some of these to you, and see what you come up with. Many scientists are often trapped within confines and traditions of their disciplines and the limits of their own education and may not think as creatively or imaginatively about some phenomenon or observation as someone who has no background at all in the subject or topic at hand.

So today's scientific puzzle or question comes from the shoreline photograph that accompanies this article. These features that occur along the beach from Cowells down to Seabright Beach are quite common, particularly around northern Monterey Bay. They aren't always clear while walking on the beach but they are quite evident in many aerial photographs.

These crescent shaped features have been recognized on beaches around the world and vary in their scale, but are typically somewhere between 25 and 100 feet across. Your question is how did these very regular or symmetrical features form? Have you ever noticed them and why are they here at some times, and not at others?

If you come up with a good idea, please feel free to send me an email and I'll plan on getting back with the best responses in my next column. Thanks.