

Sample 1: “Reassessing Narratives”

An unseasonably hot day accentuates an already punishing summer, long drawn out, fiery, and desiccated. Fully exposed to the damning sun, eight men sluggishly dip their paddles in the sea. Five women and three small children are tucked within the long canoe-like vessel, desperately seeking shade. Despite a calm surface, the canoe — or ‘tomol’, as these people call it — lacks grace as it cuts through the low waves. The men have little energy. Their bodies are gaunt and frail. The women and children look much the same. Fortunately, just above the bow lies a view of their destination. Their refuge.

The long stretch of island ahead, called ‘Limuw’, is shrouded in a dark cloud. In stark contrast, the mainland that lies behind the tomol’s stern reflects mirage-like waves of heat; vegetation sparsely dots the hills. The land left behind has ceased to provide reliable nourishment. To escape to the promising landmass ahead, the men must tap into every bit of energy they could eke out from the dying landscape astern. However, impatience will do more harm than good. The men must maintain a slow and even pace as they cross the channel. But, to stave off imminent exhaustion they must battle their stomachs’ impatience.

As the sun hangs low in the sky, starboard side, the tomol closes in on the shores of Limuw. Breaching the fog layer, the island’s luxuriant foliage comes into view, and heads pop up to peer over the boat’s gunwales. Filled with anticipation, the men let go of their discipline, and tap into their most dormant energy stores. Jamming their paddles hard into the water, they surge forward. Finally, the vessel grinds against the rocky shoreline, and the band of destitute sea-farers step foot on their new home.

A short moment later, thirty-two eyes simultaneously train their gaze on the top of a precipice. Their mouths begin to water. What they see is hard to believe. No name exists for the beast. It is absolutely foreign. But their stomachs register just one thing: meat. All eight men frantically grab their spears, and with every ounce of strength they have left, charge toward the hills.

In its oblivious snacking on wild rye and fescue, the grazing quadruped could have never anticipated the eight predators it would soon fall to. Nor could it have done anything to defend itself even if it had expected the voracious newcomers. Soon, the fantastic — both in the colloquial and original sense of the word — creature perishes, serving sixteen desperate souls.

Its meat is immediately set over a flame to fill the group’s stomachs. In the following days, leftovers are coated in sea salt and set out to dry under the sun. The largest bones are carved into weapons, utensils, needles, and fish hooks. The hoofs are fashioned into musical instruments and bowls. The most magnificent components of the beast, two curved, meter-long tusks, are reserved for ceremony. No piece is absent of utility.

The single tusked beast easily sustains the family of sixteen for weeks. However, good news travels fast. Soon, Limuw receives more arrivals by tomol. With haste, more meat is harvested by each set of newcomers. Until one day, no tusked beasts remain.

The story I have laid out above is effectively untrue. At least the majority of experts say so. The prevailing theory of how the great tusked beast of the channel islands—the pygmy mammoth—went extinct is that it was a direct result of a changing climate (National Park Service [NPS], 2020). In this narrative, the Island Chumash people were not an intermediary to the pygmy mammoth's extinction. Instead, researchers say that as ice from the last ice age melted, and America was quickly enveloped by lakes, rivers, and marshes, the available biomass diminished (St. John's College, 2021). On Santa Cruz Island, available landmass was similarly enveloped by the rising sea. This left limited space for the pygmy mammoths to graze. As the mammoths fought each other for resources, the population as a whole eventually lost to the limitations of their habitat (NPS).

On the other hand, some experts would contend with the sentiment of the fictional narrative above; humans may have played not just an evident role, but perhaps the primary role in the pygmy mammoth's demise. These arguments are made on a few grounds of evidence. For one, there is historical precedent for human caused extinction under similar circumstances. Experts also point to global and local geological knowledge that corroborates this idea (Stewards of Nature). For some experts, enough evidence exists to at least render the question without a definite conclusion. However, the incongruous question of the pygmy mammoth's extinction is not a useless thought experiment. It is meaningful in the problems of today. How we assess biological history can determine how we manage the biological future. Should nature be allowed to take its course? Should humans attempt to reverse their disastrous actions? Incomplete accounts of extinction may only limit foresight. In this anthropocentric era that many scientists are calling the "sixth mass extinction" (Leakey & Lewin, 1996), it becomes enduringly more necessary to contemplate full accounts of biological history to assess the ways in which nature's past can benefit the present and future.

When I made my own journey to Santa Cruz Island—unfortunately not by tomol, but by ferry—I was searching for another unique species. The island scrub jay, a species that diverged from the mainland California scrub jay, would hopefully find its way onto my life list of birds before my departure. Although the island variety looks almost indistinguishable from its mainland counterpart, a keen birder can notice the differences. Island scrub jays, compared to California scrub jays, are far more drab; their blue upper plumage is dull and mottled with black. Their bellies are paler, and bills larger. Most notably, they are about one-third larger than the California species, an evolutionary shift brought about by a lack of competition for food (Graham, 2009).

Not far into my arrival, I found an island scrub jay. It was not a challenge, as I soon found, because like most corvids, they are the first to take advantage of picnic table crumbs. After setting up camp and securing my food safely away, I was lucky enough to procure a complimentary kayak tour that would lead me to some more infrequent bird species. Caden, the guide I connected with to make the tour happen, is an expert in the island's natural environment. While he is not an expert in the scientific sense, he does have a keen instinctive understanding of the island and holds a wealth of experiential knowledge. Beyond his quiver of fun facts to feed tourists for his job, five days a week spent living in a tent, sleeping among the owls and foxes, should provide any reasonably astute resident with loads of observational insight.

Caden was able to lead me to a cave where we found a pair of nesting guillemots; additionally, to a small, rocky island where a peregrine falcon was perched, occasionally

attempting dives for fish at its famously record high speeds. He even pointed me in the direction of a bald eagle's nesting rock that I later ventured out to, and was in fact lucky enough to find one flying overhead toward its nest.

Of all the local knowledge Caden has, one thing he showed me lingered in my thoughts longer than the delight of having new birds for my life list. As we approached a protruding rock over some caves to the west of Scorpion Cove, he asked, "what does that look like to you?". I told him it looked like an elephant. It had a rock spire attached to a 'head' that extended down to the water, making it look like an elephant drinking from the sea. He told me I was wrong. "How could I be wrong", I said, "it looks just like an elephant". Plus, who was he to tell me what I think a weird rock looks like? He responded, "well, you would be right, except that elephants have never been to Santa Cruz Island, or the Americas for that matter. But *mammoths* have". The story that followed prompted my curiosity about the channel islands pygmy mammoth.

Mainland columbian mammoths, Caden told me, made their way over to the Channel Islands about thirty thousand years ago. At the time, the islands were all one big island, now referred to as *Santarosae*. The islands were connected due to low sea levels during the last major ice age, which also significantly shortened the distance between the island and the mainland, and may have even provided a land bridge. This allowed mammoths to either swim a very short distance, or perhaps just plain walk to what is now the Channel Islands(Duggan, 2024). The mammoths were likely looking for a more vegetated habitat than the overgrazed mainland, coincidentally the same reason for the Chumash making the journey twenty thousand years later(Schwemmer, 2021). With an abundant supply of food, the mammoth population grew rapidly. But, the island could not support a significant population of these 20,000 pound animals. Over time, the mammoths adjusted to their new habitat that was already limited in food, and was shrinking from rising sea levels as the ice age came to a close. The eventual result was a new species, weighing only 2,000 pounds and standing at a height of no more than 7 feet(NPS).

Considering this evolutionary phenomenon, pygmy mammoths have something in common with island scrub jays. The downsizing undergone by mammoths on the Channel Islands is a process called "island dwarfism". The term is complemented by the opposite process, "island gigantism", which describes the enlargement undergone by species like the island scrub jay, for instance. These terms were coined by mammalogist J. Bristol Foster who furthered Charles Darwin's basic theory of evolution to describe these unique processes within island ecosystems(Lomolino, 1985).

Much like the famous Galapagos finches Darwin studied whose distinct bills were adapted to various food sources on their respective islands, Foster noticed deviations in overall mass that correlated with food availability on island habitats. "Foster's rule", also called "the island rule of gigantism and dwarfism", states that smaller animals such as rodents and passerine birds tend to be larger on islands compared to their continental parallels; inversely, larger animals such as ungulates—hoofed mammals—tend to be smaller. This is because smaller animals, like the scrub jay, are typically not subject to the same predation levels on islands; and larger animals, like mammoths, simply have less food to eat because they are forced to migrate on a comparatively smaller scale(Lomolino, 1985).

Caden capped off his mid-kayak lecture with a tour guide's quip; a necessary integration into any good outdoor guide's information dump. He told me, "All of this is to say, don't spend

too much time on the island. I'm only five-foot-six now. When I started working here I was your height".

To return with my own quip, I asked Caden what I should do to keep him from going extinct along with the pygmy mammoths. He had no definitive answer. Before I had researched what consensus science reached, I had my own guess.

I thought back to an ecological research program in New Zealand I had been lucky enough to be a part of. New Zealand is extremely effective at providing the necessary characteristics for gigantism and dwarfism to occur due to its sheer size and significant isolation from any other land mass. The island's massiveness allowed for many endemic species to evolve without as much co-existential friction, and its isolation reduced the potential for a predator to find its way to the island (Environment Foundation, 2018). All of New Zealand's unique ecological factors allowed for over eighty thousand endemic species to evolve. Some of its most exotic and attractive wildlife includes the likes of a colorful parrot the size of a large hawk, called the kea, and a gigantic tree species that regularly lives for over 2000 years, called the kauri tree. Perhaps the most highly recognized specialty of New Zealand's ecology is that it holds sixteen of the sixty extant flightless bird species on earth, including the famed kiwis (New Zealand Department of Conservation [DOC]). Many thousands of years ago these presently earthbound birds gradually gave up their wings in the absence of predation (Weathington). This almost other-worldly biodiversity is the result of over 80 million years of isolated evolution, since New Zealand broke off from the former supercontinent, Gondwana (McGlone, 2007).

Though more than fit enough to survive in the conditions under which they evolved, many unique island species are now at risk of extinction as a result of human intervention, especially the beloved flightless birds. One of the first of these birds to be lost forever — upon initial settlement of New Zealand by Pacific Islanders, circa 1000 CE — was the moa, a much larger relative to the Australian emu and cassowary. Standing at a height of 3 meters, this now extinct species of apterous bird dominated the islands of New Zealand. Its genus is appropriately called 'dinornis', denoting that its supremacy was akin to that of the dinosaur. With an ample food supply consisting largely of massive tree ferns, and occasional predation limited only to the Haast's eagle, moas were due to continue their reign over New Zealand's ecosystem, and natural evolution was not going to stop them. That is, until humans capitalized on the ideal food source that the moas could provide (Wallenfeldt).

Unlike the disappearance of the pygmy mammoth from the Channel Islands ten thousand years ago, we have reliable details of what happened to New Zealand's moa. When Pacific Islanders ventured south to Aotearoa — meaning "land of the long white cloud" because of the haze that covered New Zealand when they arrived — they were expanding out of necessity for resources. The swelling population simply needed somewhere else to go, and they were in luck when they found the towering and virtually defenseless bird on the newfound landmass. Without any time-tested ecological knowledge, the newcomers quickly took out every last moa, and the moa could not reproduce fast enough to keep up with human appetites (Convention on Biological Diversity).

With the knowledge I had of the moa's fate, I could only presume that the Channel Island pygmy mammoths suffered the same fate for the same reason. It simply made sense. It seemed so logical, I almost did not bother looking into it further. But curiously, I found, this is not what a

majority of science and history tells us about the mammoth. Upon further research comparing the majority consensus with the human-driven extinction argument, it did not seem to me that any more evidence supported the latter than the former. So, then, why do so many more experts buy into the climate-driven argument?

Possibly this is because it is an easier idea to stomach. Some people cannot even agree that humans are at fault for *today's* environmental damage, let alone accept that it is a part of our deep history (Loreau, 2023). In fairness, it is not easy to accept that everything we strive for as a species—expansion, control, optimization—has and always will damage the world we live in. To instead decide these outcomes are out of our control allows us to cope with the possibility that our very nature as humans may have been damaging to the earth since long before the modern era.

Since all postulations on the disappearance of the channel islands pygmy mammoths are based on incomplete evidence, it is only conjecture to assert one cause over another. For this reason, it is non-constructive to argue fully for one solitary position. Instead, discussion of each and every possibility serves an important metacognitive purpose, revealing how we can learn from history. In a book titled *Prehistory of Santa Rosa Island*, one expert in Channel Islands natural history, Phil Orr, assumes the important task of laying out the evidence for the climate-driven claim, the human-driven claim, and additional possibilities as to not leave anything out of the question.

It cannot be stressed enough how important it is to consider Orr's versatile perspective. So often does science require a definitive, inarguable answer to our questions, that when strong evidence is lacking it can be difficult to accept a non-answer.

However, in a case that fails to reveal a solution, we can paradoxically learn the most. This is where science essentially turns to philosophy. More uncertainties produce more questions. Those questions, in turn, may have answers, or they may produce more questions. This investigational expansion is often what gives historical science meaning in a contemporary context.

In the mystery of the pygmy mammoth, little would come from the knowledge that an ending ice age caused the extinction. In the present, we have no ice age to deal with. But when the human-driven narrative is given equal weight, there is no hard stop in the philosophical inquiry. More questions can be asked. Is it coincidental that pygmy mammoths went extinct circa ten thousand years ago, right around when the earliest human remains on the island are dated? Why did the mammoths not keep getting smaller as their resources diminished? How did the Island Chumash allow an extinction by their own hands when indigenous knowledge has been known to support healthy ecosystems?

That last question, in particular, holds a lot of weight in our modern situation. Today, progressive ecologists look to holders of traditional ecological knowledge for help. Often, they can provide information that science lacks. The beauty of indigenous knowledge is that it has been developed over several generations. It is not proper science, but proper science is young. Science under the scientific method has been performed on such a short scale of time that there are infinite holes that can be filled by the traditional knowledge that has been accruing for so much longer (Nelson, 2018).

But then we look again at the extinction of the pygmy mammoth, or the moa by people who did not live by the exploitative means that the western world subscribes to today. Yet, there was exploitation. It is important to note that indigenous people should absolutely not be judged for this exploitative behavior. Similar to western civilization, which is rooted in the short-lived scientific method, the indigenous groups who overused newfound resources simply did not have enough accrued knowledge of their new homes.

What all of these historical extinctions tell us is that the world needs to be studied. It takes time to understand how to reach equilibrium in our environments. Environmental disturbances like biodiversity loss, deforestation, and climate change are not new themes in human history. Our ancestors have had to learn from their mistakes to fix evident problems. Over generations, many groups have managed to establish balanced, reciprocal relationships with their local ecosystems. It just takes time.

To stress it further, modern science is incomplete in its youth. Yet, if knowledge slowly flows in conjunction with the recognition of our faults, we may be able to establish the same stability as the indigenous groups we look to as perfect environmental stewards. It is crucial to recall that at one point they were not perfect. They only sought and maintained deep connections with their environments to ensure continued growth towards perfect symmetry. For our purposes, it does not matter if they succeeded in perfection, only that they were unwavering in their prolonged efforts.

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