The “Post-Quantal Garden” Annotated

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Abstract

The Post-Quantal Garden is a work of speculative fiction based on J.G. Ballard’s short story “The Terminal Beach” first published in 1964. Set within Donna Haraway’s climate-changed Chthulucene, the work is intended as an elliptical rumination on the history of nuclear testing in the Pacific, bio-hacking, tropicality, and apocalyptic narrative. Moving between historical fact and speculative fiction, the story takes the form of a scholarly introduction to and contextualization of fictional passages from an imaginary journal supposedly found during the very real radiological clean-up of Enewetak Atoll. Enewetak, an atoll in the Marshall Islands group, was used by the US for nuclear testing and was the site of operation Ivy-Mike, the first fusion bomb test, and is the setting for Ballard’s Terminal Beach.

Keywords: Speculative fiction, cli-fi, JG Ballard, climate change, bio-hacking, nuclear testing, Chthulucene, Enewetak Atoll, tropical imaginary
Preface

Of the many tragedies that befell the world in the wake of climate change, the loss of the Marshall Islands was a minor but important early augur of the devastations that would mark the latter half of the 21st century. Resting never more than a few feet above sea level, the small group of coral atolls running through the Pacific at roughly 10 degrees north, 170 degrees east, were among the first places in the world to disappear beneath the rising waters of the diluvial period. With tragic symmetry, anthropogenic sea level rise displaced most peoples of these islands during the mid-2020s, just as US nuclear testing had done half a century earlier. That the fruits of such colonial and technological hubris should be continually harvested by nations least responsible for them is one of the many horrific legacies of the Anthropocene. Displaced Marshallese communities would come to form the basis for many of the refugee camps that would eventually redefine the rapidly growing megacities of the US interior during the middle decades of the 21st century.

Beyond their shared fate, what distinguishes the Marshall Islands from other drowned places of this period is, of course, that *Macrocystis enewetaciae* was discovered there by Nobel laureate Aulani Alik. Famously, Alik discovered the heterokont in 2058, crowding the former lagoon of Enewetak atoll, from which it derives its name. As the reader undoubtedly knows, the discovery and subsequent engineering of *Macrocystis enewetaciae*, commonly known as God Kelp, breathed new life into the seasteading movement, kicking off the second green revolution, and firmly establishing the social and economic viability of carbon farming and sequestration as a method of carbon draw-down. If there is a single point on Earth where the entangled origin of the Chthulucene can be located, it may very well be the sublime blue of Enewetak’s submerged lagoon.

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1 The concept of the Chthulucene Epoch was introduced by the 20th and 21st-century philosopher Donna Haraway. The theory disposes of reductive Enlightenment notions of individual human singularity, instead embracing the inherent complexity – the ‘tentacularity’ – of life on Earth and the obligate, if often unrecognized, symbiosis between

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And yet there have always been questions around the discovery of God Kelp. How did such a large species, growing so near the surface, evade discovery for so long? Did the history of Enewetak itself, as first a nuclear testing ground and then radiological disaster site play a role in hiding this important species? Could it be that God Kelp is the accidental result of Enewetak’s long radiological history? Or, as Okung, Berman and Ling (2072) have provocatively suggested, is it that God Kelp, even before Alik’s engineering, was an anthropogenic species, introduced by accident or some last, desperate act of bio-hacking gone wonderfully right? At the risk of sounding cliché, we may never know. However, a deep dive into the atoll’s history, particularly the short period between the end of US nuclear testing and the beginning of radiological clean-up, provides tantalizing clues.

The postdiluvian landscape of Enewetak is the reflexive product of both 21st century changes in global climate and the vast 19th and 20th century colonial, technological, military and industrial complexes that sparked those very changes. After World War II, the Marshall Islands were converted to the Pacific Proving Grounds by the U.S. Department of Defense and the U.S. Atomic Energy Commission. Between 1946 and 1962, one-hundred and five separate nuclear tests were conducted in the region. Forty-three of those tests were conducted on Enewetak Atoll (also sometimes transcribed as Enewetok or Eniwetok). A chain of forty-three small islets surrounding a large central lagoon at the Western edge of the Marshall group, Enewetak is one of the most remote locations on Earth. Prior to the nuclear testing period, Enewetak’s native inhabitants were relocated to Ujelang Atoll – roughly 135 miles to the southwest. Testing began at Enewetak in April of 1948 with Operation Sandstone and concluded in April of 1958 with a massive surface bombardment of the island during Operation Hardtack I. The island was abandoned between 1958 and 1963, and from 1963 to 1968 it was used as an impact and scoring target for intercontinental ballistic missiles launched from the United States. After 1968 the atoll was again officially abandoned until 1972. In April of 1972 President Richard Nixon announced that the atoll would be released to the Trust Territory of the Pacific Islands and radiological clean-up would begin.

The radiological clean-up of Enewetak was the first attempt by the US government to repair a landscape devastated by nuclear testing. The bungling of that operation...
mostly writes the final chapter of Enewetak’s antediluvian existence. During this period all structures and soil were scraped from forty-two of Enewetak’s forty-three islets. The collected material was then mixed with concrete and dumped into a large blast crater on Runit, one of Enewetak’s largest islets. The concretized material was then capped with a concrete dome, later referred to as the “Runit Dome”, and then largely forgotten. Runit was fully inundated during a typhoon in 2026, leaving only the top two-thirds of the Dome above water. Eventually, water infiltration weakened the dome, causing it to collapse on August 7th 2028. The collapse of the Runit Dome jettisoned radioactive material across the tropical Pacific. Some have gone so far as to place the collapse of the Runit Dome on the scale of the Chernobyl or Fukushima Daiichi disasters, albeit in a very remote location with few direct casualties.

Figure 1. Enewetak Atoll

This nautical chart was adapted from an original 1976 US National Geospatial Intelligence Agency Map showing Enewetak Atoll with the 20th century US designated code names for each islet. The original map was rescued from a large cache of paper maps discarded by the US National Archives in Washington pre-inundation. The chart was digitally scanned and augmented by the author to bring out the islets and show the locations of the major US nuclear tests that were conducted on Enewetak.²

² US National Geospatial Intelligence Agency. (1976). *North Pacific Ocean, Marshall Islands, Enewetak Atoll* [map]. (1:100,000.) Washington DC : US National Geospatial Intelligence Agency. A curious feature of the original map is its rather lengthy disclaimer. NGA policies from the time reflect the relative growth of counterfeit and other misinformation circulating in the US during the 20th century’s fin-de-siècle. Ironically it is partially such misinformation that delayed any significant US response to climate change resulting in the inundation of both
Records from operations on Enewetak were largely declassified during the late 1980s and 1990s. A series of lawsuits during this era, first on behalf of the native population and later on behalf of the American clean-up crews, sought restorative justice for the environmental degradation of the atoll and subsequent health ramifications resulting from the island’s contamination.

Despite the extent and longevity of operations on Enewetak, its federal archives are relatively thin. A richer source of experiential information about the atoll comes from written and recorded accounts of some 4,000 US military personnel responsible for the environmental clean-up, and mid-21st century accounts from the few surviving native Enewetak people. Despite prohibitions against taking possibly contaminated materials off the island, numerous visitors throughout the 1960s and early 1970s felt compelled to carry various items away with them. While a large number of these items are now collected in Alik’s Enewetak Archive in Bangkok, it is likely that many more have yet to be found or are lost to history.

The most important of the items collected on Enewetak during this period is undoubtedly the journal of Anders Travern. Travern, a petty officer aboard the USS Constellation, was thought lost at sea in 1964, but evidently made his way to Enewetak sometime in early 1967. Whether this was by chance or design we do not know. Travern’s journal is a roughly bound collection of scrap papers running to several thousand pages. Largely the journal documents his day to day life on the island, and it is through his journal that we get one of the best descriptions of what the island may have been like at that time. No exact accounting of the structures built on Enewetak still exists, though Travern’s journal and several snapshots taken by the radiological clean-up crews suggest that dozens if not hundreds of control bunkers, photographic or “camera" bunkers and “hooded” or radiologically shielded observation towers were built during the decades of nuclear testing. It is among the ruins of these structures
that Travern’s journal is largely set, and it was in one such camera bunker that the journal was discovered by members of a radiological survey team in 1973.

Of special interest are Travern’s seemingly nonsensical ramblings and his vague religious belief system which surface periodically throughout the journal. Collectively these few passages have come to be known as the “Post-Quantal Garden”. We do not know whether Travern brought these beliefs with him to the island or if they are the product of his long isolation, but for many who have read them they seem to provide a clear, if apocryphal, set of answers to the questions surrounding God Kelp as well as a suitable origin myth for our current age.

“Yasuda,” the subject of Travern’s more shambolic passages remains a mystery. Perhaps, as Okung, Berman and Ling (2072) have suggested, Yasuda was a Japanese fisherman or other sailor, similarly marooned on Enewetak during its period of isolation. If so, he was never reported missing – at least under that name. More likely, Yasuda is, as Shelley and Bowers (2073) have suggested, a figment of Travern’s imagination or the ramblings of a mind driven mad with hunger, scurvy, radiation sickness, or all three. The journal, if accurate, suggests that Travern was stranded on the island for at least four years, from 1967 to 1971. The episodes that comprise the Post-Quantal Garden seem to have occurred throughout that time, with the journal’s abrupt and puzzling end suggesting that Travern may have died at some point in 1971. Conspiracy theorists have made much of the fact that no remains were reported by the radiological survey crews that began sweeping the island in 1974, though this is hardly surprising given the regular flooding and typhoons the island was subject to even at that time.

It is with an eye to such conspiracies that, with permission from the Enewetak Archive, the relevant sections of Travern’s journal—those passages comprising the Post-Quantal Garden—have been reproduced here for the first time with annotations.

On a personal note, the reader should be aware that I make no claims for Travern’s story, true or untrue, nor for the value of its mythopoeia. It is not my goal to illuminate the poetic or religious meaning behind Travern’s words, nor to rationalize them – I leave that to you, dear reader. With this text I have only endeavored to set Travern’s words within their historical context so that readers may better assess their value and/or authenticity. To a reader approaching these passages for the first time, I can only suggest that they proceed to draw conclusions with extreme caution.
The Post-Quantal Garden

**June 17, 1967**

I am overcome by light. Light turning life to dust. Dust to life.

My memories of infant nightmares recall the fetal bliss of our interlocking spine and the terror of its severing. As a child, I felt his quantal soul call to mine across the sea. Life calling to death. Death to life. The frayed ends of our partial selves straining toward reunion. It is here that he called me, and here, in this place, he comes to me.

**August 30, 1968**

Six days past I lay upon the beach, unblinking Yasuda beside me, the sun a corona about the eclipse of his head. It was there that he explained the mystery of our birth and division; how, in that singular moment when Little Boy hung in the air above Hiroshima, our unified soul first slipped into the world—and was also split. A phantasmal nucleus divided. His fractional self coming to rest within the child that was, burned but alive. Mine pushed through the earth into the child that was not. He told me what I knew as truth, that I fell from my mother on that day, silent and blue, unready but alive. Afraid, I rejected him. I was unready, and in that singular moment of our reunion, my quantal mind broke and I fled amongst the craters.

I wandered then, lying at night on the tarmac or wallowing, blind, within the mud and debris of the target basins. Always the sun followed, endlessly circling above lagoon, atoll, horizon. Ever westward in its holy circumnavigation, its torrid glare born to purpose within those concentric fields of ruin, architectures of sight and measure: hooded towers, slotted bunkers, dead, prone within the target basins. An

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3 Scholars have interpreted the phrase “unblinking Yasuda” alongside the imagery of the solar corona as a reference to everything from Ra to Buddha to the icons of Christ within Eastern Orthodoxy.

4 Note that some scholars have interpreted Travern’s scrawled antepenultimate sentence as beginning with the phrase, “his fractal” rather than “his fractional” as I have interpreted it here.

5 The United States dropped the first fission bomb, “Little Boy” over Hiroshima on August 6th 1945. Birth records show that Anders Travern was born in Omaha, Nebraska on August 6th 1945, to Margaret and Jan Travern.

6 Birth records from the Nebraska Department of Public Health show that Travern was severely underweight at birth, just 3lbs 2oz.

7 Nuclear testing and intercontinental ballistic missile targeting left craters on many of Enewetak’s islets. Most of these were filled during reclamations efforts, though a number are still visible in aerial photographs of the atoll from the early 21st century.

8 Regular references throughout the journal to “the tarmac” insinuates that Travern may have mostly lived on the largest islet “Fred”, also known as Enewetak — from which the rest of the atoll draws its name. Enewetak’s landing strip, built during World War II, was used to shuttle food, personnel and supplies to and from the atoll during nuclear testing and after.
overexposure, a burnt husk, a landscape of light and shadow designed only to scrutinize death.  

December 27, 1968

My body cracks and splits as I shed my human skin. The sores on my hands and feet are filled to bursting and my knees swollen and hard as ripe beets and in my waking dreams I see the jagged outline of a Silurian carapace lurking just beneath. To live I knew that I must scrape the salty flesh from the coconuts adrift in the lagoon – sunlight trapped in skeletal gyres, their meat like dirty snow.

August wanes and the angles of my heart soften, rounding to his pull, drawing me north around the island’s curve. I am frightened. I am but part. I do not know what it is to be one.

September 29, 1969

I dreamt a circular void – a deepness within the lagoon. At its center, spread upon a verdant mat, lay Yasuda, his hair like kelp upon the waves, his hands green amidst the sea.

March 26, 1970

The dreams again though I had thought they ceased. This time I saw myself driven north along the inner curve of the lagoon, the sun boiling the flesh from my back, each islet slipping past, barren and white, like vertebra on a crooked spine, their alphabetized names: Wilma, Vera, Ursula recalling zones of significant time: Holocene, Pleistocene, Pliocene.
In the night the dreams came upon me once more. I saw blood amidst sand and pale coral, red first and then as opalescent seed, spread across the bones of eons.

On waking I committed myself to endings. I have broken camp and secured my few possessions within the dry confines of my bunker. I take only this journal and my service pistol, though I do not know if it will still fire. I do not believe I will return.

I found him resting, enthroned amidst the coils of radio-wire and weed washed ashore along the curve of Irene. His eyes bright pits beneath a tangle of hair. We met then, each half of us, amidst rock and wire, beach and bone. Our shadows cast down, our quantal soul, reunited.

At that moment, within sight of her void, Yasuda revealed the Paradox of Flora. That, though I did not feel her death, still her particles settled within me. That she, though heavier, was now suspended. That we breathe her, and so she resides in us all. Flora, radiocaesium, collecting in our bones, changing us forever and yet we are unaware.

There, along Flora’s rim, Yasuda explained that this was the site of first fusion– where our quantal souls would reunite, becoming exponential, exothermic. He told how together we would make the world anew, forever post-quantal. Undifferentiated. Undivided. Whole.

In his tent amongst the dunes, Yasuda had fished the mutating genes from seaweed and stalk, culturing them amidst sea and sponge. And it was then, in that tent, that I

alphabetically backward in Travern’s passage, suggesting that he may have started from Fred and was moving counterclockwise North along the atoll’s curve.

Tavern was issued an M1911A1 service pistol that was presumed lost with him.

Irene is a small islet on the north coast of the atoll. Operation Seminole 56 vaporized part of the island leaving a crescent beach surrounding a water filled crater.

Travern is likely referring to the American military pseudonym for the vanished islet Flora, also known as Eluklab by the native Enewetak people. Flora/Eluklab, along with the smaller islets Gene and Helen, was vaporized on November 1st 1952 by Operation Ivy-Mike, which was designed to test the first thermonuclear device in which a portion of the bomb’s yield comes from a fusion reaction.

Radiocaesium or cesium-137 is amongst the most problematic of fission products because of its high water solubility. Cesium-137 is a permanent anthropogenic addition to the global environment and can be found in all living things.

The blast from Ivy-Mike resulted in a crater roughly 6,240 feet in diameter and 164 feet deep, which is still visible today. The explosion was so powerful that it flung pieces of radioactive coral onto the decks of ships anchored 35 miles away. Ivy-Mike is still the 10th largest nuclear detonation on record.
took up the syringe and perforated his body, spreading a staccato tattoo across chest, spine, hand, forehead, neck and shin. All while he gave onto me the revelation of cyst and mutation, of chromosome and chloroplast. And last, the final revelation of satiation and profusion – the revelation of the post-quantal garden, where all severance is erased, where life is welded to life in an undying circle.

And he told me what I must do.

**October 15, 1970**

Last night Yasuda bathed within the heat of inverted Flora, his flesh burgeoning with the polyps of new life. This morning his body lay upon the beach, warm but unmoving, and I felt my soul complete at last.

I have not disturbed the corpse. I must wait and watch for the sun, giver of all life, to distill the broth of its pores, for the polyps to grow within it, round and red as the arils of a pomegranate. Only then will they burst forth, saplings rampant upon this terminal beach.

**September 27, 1971**

And now, in death, I am become life, maker of worlds beyond knowing, gardener to generations unborn.²⁰ As I leave, I let my garden go wild, its seed to spread on wind and wave, that the world may consume, and be consumed by this new Eden.²¹

Blessed be Yasuda whose children thrive, rampant within this post-quantal garden.

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²⁰ This sentence is an inversion of J. Robert Oppenheimer’s supposed quoting of Vishnu’s phrase in the Bhagavad Gita, “Now I am become Death, the destroyer of worlds” during the Trinity test near Alamogordo, New Mexico on July 16th, 1945.

²¹ The declassified elements of the radiological survey and subsequent reclamation effort give no indication that any vegetation was found on or removed from Enewetak. The few remaining photographs of the clean-up effort show only low scrub.
References

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Jake Boswell is Associate Professor and Graduate Studies Chair of Landscape Architecture at The Ohio State University. His work centers on the entanglement of cultural, technological, and natural systems in the production of designed and vernacular landscapes, focusing on climatic imaginaries and attempts to alter climate. He comes to this interest through an education and training in landscape architecture, city planning, and cultural anthropology. He pursues this work through a hybrid practice based in historical inquiry and design speculation. He is published nationally and internationally, and his speculative and applied design work have received recognition in numerous international design competitions. In 2018 he was named an Andrew W. Mellon Fellow in Urban Landscape Studies at Dumbarton Oak’s Research Library and Collection. In 2021 Boswell received the world’s first utility patent on floating concrete islands.