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Environmental Catastrophe as Morphogenesis: Inhuman Transformations in Ballard's Climate Novels

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Abstract: This paper offers a discussion of J. G. Ballard's first four novels, *The Wind From Nowhere* (1962), *The Drowned World* (1962), *The Drought* (1965), and *The Crystal World* (1966) that centers on their portrayal of environmental transformation. Drawing on revised conceptualizations of the second law of thermodynamics and recent materialist scholarship, I illustrate how Ballard invokes material transformations that are ambivalently coded as terminal stasis and morphogenesis. In anticipations of the paradigm of the Anthropocene and ecocritical approaches to global climate change, Ballard's novels re-embed the human in an ecology of inhuman forces and modes of self-organization that radically challenge entrenched ontological divisions and systemic boundaries. Particular attention is paid to the ways in which emergent structures, such as hurricanes and crystals identify his landscapes as dissipative systems far from equilibrium and rife with potential for the spontaneous generation of form. This resonance with scientific frameworks reveals itself in poetic registers that parallelize metaphors of life and death, and hinge on an estrangement of not only landscape, but also temporality, thus literalizing what it might mean to understand the human as a geological subject in the age of the Anthropocene.

Keywords: Ballard; Anthropocene; entropy; complexity theory; ecocriticism; inhuman life; thermodynamics; dissipative structures; crystals; meteorology; climate change; new materialism; prehumanism; science fiction

1. Introduction

Are we going or are we staying? The implications of what has been called the Anthropocene are ambivalent. When Bronislaw Szerszynski asks, "is this the epoch of the apotheosis, or of the erasure, of the human as the master and end of nature?", he reminds us that appointing the human as the namesake of a climatological era implies imagining its mineralization—if not its extinction then at least its potential far-future disinterment (Szerszynski 2010, p. 16). Temporally, the Anthropocene invokes the limited hegemony of the modern industrial human as a geological force. Spatially, it anticipates a reintegration of the human into the material strata of the planet. What an apt testimony to the human condition it presents: an inscription of simultaneous delusion of grandeur and utter fragility and transience. As a geological subject, the human is returned to the ground and unsettled in its belief in transcendence and its fantasized detachment from an ontologically separate environment. Coupled with the recognition of anthropogenic climate change, the Anthropocene signifies an estrangement of the relationship between subject and object. Eugene Thacker points to the increasing frequency of hurricanes, floods, wildfires, droughts, pandemics, and heat waves as the expression of a world that "bites back," resists, or ignores our attempts to mold it into the world-for-us" (Thacker 2011, p. 4). Paradoxically, the invocation of the Anthropocene re-attaches the human to the planet and at the same time serves as a reminder of the inhuman presence of what Thacker calls the "world-in-itself" (5)—a boundary state both crucial and inaccessible to the realist imagination of modern science. Following

Thacker, it is in literary genres of horror, science fiction, and the supernatural that we come closest to imagining the world-in-itself through the speculative “subtraction of the human from the world,” thus envisioning a “world-without-us” (ibid.).

Frequently enlisted as early examples of climate change fiction (see, for example, [Clarke 2013](#)), J. G. Ballard’s first four novels *The Wind from Nowhere* (1962), *The Drowned World* (1962), *The Drought* (1965), and *The Crystal World* (1966) stage the confrontation of the human with the looming specter of its erasure.¹ What I aim to show in this paper is how Ballard’s climate quartet novels portray the resurgence of material forces in terms that suggest a deep-seated ambivalence with respect to the relationship between human subjectivity and the inhuman environment. Rather than unambiguously invoking destruction or extinction, Ballard’s climate novels come with a conspicuous promise of emergent form, of a new type of hybrid subjectivity in which the human and the inhuman are enmeshed. Famously mirroring the grotesque metamorphosis of the outer landscape in the psychological transformation of his characters, Ballard literalizes a physical boundary condition that is shaped as much by entropic atomization as by ecological entanglement. His debt to the modernist aesthetics of writers such as Joseph Conrad, Thomas Mann, T. S. Eliot, Franz Kafka, and Samuel Beckett becomes particularly apparent in his re-inscription of a human subject that, faced with dissolution, loss, and ruination, responds with a retreat into the interior. Simultaneously, however, Ballard’s quartet anticipates a late twentieth-century ecological discourse that regards the self-contained liberal humanist subject as illusory and by virtue of its planetary emplacement always already physically and psychologically extended and mixed up with inhuman materialities. Whereas the former raises anxieties of stasis and death, the latter foregrounds the potential for morphogenesis and emergence—concepts that originate in the natural sciences to describe processes of self-organization amidst far-from equilibrium conditions.² In what follows, I will draw on thermodynamics and complexity theory to illustrate the ways in which Ballard portrays environmental catastrophes as scenes of both disintegration and formation, suggesting a response to what it might mean to conceive of the human as a geological subject.

Reading Ballard in dialogue with the natural sciences as announced by the theme of this special issue needs to begin by recognizing his simultaneous celebration of and disillusionment with the genre of science fiction. While he proclaims science fiction “the most important fiction that has been written for the last hundred years” ([Ballard \[1971\] 1997a](#), p. 205), he has repeatedly expressed his impatience with the conventionalized tropes of so-called Golden Age SF. Deriding the “juvenile” appeal of space exploration fantasies and, by extension, the ideological conservatism inherent in the glorification of the infallible male technocratic hero rampant in the pulp magazines of the 1930s and 1940s ([Ballard \[1962\] 1997d](#), p. 195), he heralds an embrace of the “experimental enthusiasm” of literary modernists and suggests a departure from the “simple plots, journalistic narrative, and standard range of situation and character” (p. 197), which he laments have dominated the genre since H. G. Wells. As a reluctant pioneer of what Harlan Ellison 1967 collection *Dangerous Visions* consolidated as the SF New Wave, Ballard mobilizes the sciences in a more oblique and metaphorical manner, confidently accepting that some readers may find his style “off-beat and abstract” ([Ballard \[1962\] 1997d](#), p. 198). Coupled with a more nuanced attention to psychogeographies, social relationships, and estrangements of the mundane—derided by some as a decline towards soft science fiction—scientific concepts enter

¹ Certainly Ballard was not the first to literalize the erasure of the human as a function of global climate change. Most notably, his novels stand in the lineage of H. G. Wells’ *The Time Machine* (Wells [1895] 1983) and M. P. Shiel’s *The Purple Cloud* (Shiel [1901] 2012).

² Both of these terms have become central for the analysis of formative processes in complex systems. Specifically via the work of René Thom ([Thom \[1972\] 1999](#)), the term morphogenesis (literally, “creation of form”) has migrated from a narrow usage in developmental biology to a more generalized employment in the mathematical analysis of nonlinear processes. The related term emergence has come to acquire a specialized meaning in complexity theory to characterize transitions in which a material system undergoes a spontaneous structural transformation that results from the interaction of a great number of independent constituents (the formation of a cyclone, the development of consciousness in neural networks, etc.). A lucid account of the centrality of the concept of emergence in systems theory can be found in [Clarke and Hansen \(2009\)](#).

his literary works on the level of aesthetic form and provide an allegorical foil for the psycho-physical metamorphosis of his worlds and characters. Less as a subject proper than as a reservoir of metaphors, science permeates especially the poetics of his early work in an exemplification of N. Katherine Hayles' assessment that "culture circulates through science, no less than science circulates through culture [and that the] heart that keeps this circulatory system flowing is narrative" (Hayles 1999, p. 21).

As several scholars have noted (e.g., Delville 1998; Wymer 2014), the overriding scientific framework governing Ballard's early novels is the second law of thermodynamics. First formulated by Rudolf Clausius in 1850, it axiomatizes that every thermodynamically closed system will succumb to the eventual disintegration of order and structure. As available energy is dissipated, the system's entropy reaches a maximum, a condition that corresponds to a uniform statistical distribution of particles and velocities. Antithetically to the Victorian fetishization of industrial and social progress, it seemed to sketch an evolutionary path that ineluctably ends in demise: the notorious heat death of the universe—not a fiery apocalypse, but the eventual transformation of all kinetic and potential energy into the random quivering of elementary particles, so-called thermal noise. As William Thomson (Lord Kelvin) explains in 1862:

The second great law of Thermodynamics involves a certain principle of *irreversible action in nature*. It is thus shown that, although mechanical energy is *indestructible*, there is a universal tendency to its dissipation, which produces gradual augmentation and diffusion of heat, cessation of motion and exhaustion of potential energy through the material universe. The result would inevitably be a state of universal rest and death [. . .]. (Thomson [1862] 2009, p. 60)

Via its introduction of irreversible action, the second law of thermodynamics, moreover, provided an implicit definition of a linear and unidirectional flow of time. The universe was not only a mechanistic clockwork, but a clockwork running down.³ It is not difficult to note the rapport with Ballard's portrayal of the climate apocalypse. Yet, I argue, his literalizations of the second law of thermodynamics and its shorthand reduction to the specter of increasing entropy decisively depart from Victorian and modernist imaginaries. Amidst dissipative environmental conditions, his protagonists are ambiguously caught in a process of not only dissolution, but also transformation. The material forces of his environments in disequilibrium precipitate both ruination and (re)birth. Lorenz Firsching is right to call Ballard's apocalypse "ambiguous," yet I am less inclined to agree that this vexation is merely a response to the "ambiguous nature of modern life" (Firsching 1985, p. 297). Rather, I would like to advance that his fiction metabolizes the ambiguous nature of material morphological processes, a concern that can be traced along a shift in twentieth-century science toward the study of open systems, the self-organizing capabilities of inorganic matter, and the fuzzy dividing lines between life and nonlife.

By the 1960s physicists had long shelved the idealization of closed systems cherished in nineteenth-century mechanics and thermodynamics. Propelled by the influential publication of Erwin Schrödinger's *What is Life?* in 1944, entropy no longer functioned as the signifier of ineluctable cosmic burnout but, in fact, of the emergence of complexity and life—an ambivalence which gestalt psychologist Rudolf Arnheim describes as the catabolic and anabolic effects of entropic environments (see Arnheim 1971, p. 27). Already in the nineteenth century, Darwin's theory of evolution presented a challenge to the thermodynamic account of universal disintegration. It took, however, another century for this apparent contradiction to be reconciled in the twentieth-century marriage of physics and the life sciences in fields that range from molecular biology, to cybernetics, non-equilibrium thermodynamics, theories of mind, ecology, and complex systems theory. Attending to some of the ways in which theoreticians in the wake of these developments have mined the structural properties of the inorganic

³ For an insightful discussion of the rise of thermodynamics and its resonances in Victorian culture, see Clarke (2001).

world for metaphors of animation and morphogenesis, I will show how Ballard is, indeed, drawn to what he himself calls “more meta-biological and meta-chemical concepts” (Ballard [1962] 1997d, p. 198).

In order to re-conceptualize Ballard’s depictions of apparent climate disaster in this context, it is illuminating to remind ourselves of the work of mathematician René Thom, a foundational figure in complexity theory, who conceives of “catastrophes” as not cataclysmic destruction, but as “local accidents of morphogenesis” (Thom [1972] 1999, p. 8). In material conditions far from equilibrium, where systems exist in flux and boundaries between internal and external environments are permeable, new semi-stable orders are bound to emerge. As Thom puts it, “the characteristics of all form, all morphogenesis, is to display itself through discontinuities of the environment” (9, italics removed). The metamorphosis of the physical environment in Ballard’s climate quartet is predicated upon this logic of catastrophe. The environment is literally dislocated and persists in a suspended, yet dynamic state between chaos and a return to equilibrium. His inorganic worlds are ambivalently cast as inert and suffused with what Jane Bennett might call “material vibrancy” (Bennett 2010, p. xiii).

Beyond the recurring trope of Gaia—the homeostatic planetary system that regulates itself—the global specter of climate change has increasingly provoked the portrayal of Earth as an uncanny other. Correspondingly, it seems almost in anticipation of recent theorizations of “ecohorror” (Rust and Soles 2014) or “global weirding” (Canavan and Hageman 2016) that Ballard breaks with Golden Age space fantasies by announcing that “[t]he only true alien planet is Earth” (Ballard [1962] 1997d, p. 197). As I will demonstrate, the alienation of both landscape and human subjectivity in Ballard’s climate novels hinges on an ambivalent depiction of the transformations that occur when the world, both human and inhuman, is out of kilter. Rather than suggest that the outcome is a variation of human extinction or death, I contend that Ballard heralds a different type of embodied subjectivity that uncovers the boundary between the human and the inorganic as always already porous and subject to diffusion and hybridization.

2. Dissipative Landscapes

An explicit theme in Ballard’s early work is the gradual convergence and eventual confusion of the external environment and the protagonists’ inner psychic world. Subject to radical transformations and upheavals, both are frequently referred to as “landscapes,” a signifier that conspicuously links up with a tradition in painting by which the natural environment has been framed through the tension between the world-for-us and the world-in-itself, simultaneously organized by the sensory apparatus of the perceiving subject and externalized as ontologically separate and inaccessible. Indeed, as we shall see, landscape painting provides a recurring signifier in Ballard’s climate novels and taking a closer look at the resonances between his literary imagination and the visualization of inhuman environments in the Western art canon is illuminating. John Ruskin famously limits the subjects of landscape painting to “natural phenomena in their direct relation to humanity” (Ruskin [1871] 2007, p. 5; italics removed). With its apotheosis in the romantic period, landscape carries within it the ambiguity of denoting both the external land and its internal aesthetic representation. Between the seventeenth and the nineteenth century, depictions of landscape transitioned from providing the background of bucolic fantasies to foregrounding elemental vivacity, or what could be called the meteorological sublime. What specifically British and American nineteenth-century landscape painters sought to capture and even imitate was an expression of divine order, a motivation that strongly resonated in the concurrent emergence of a new set of natural philosophical disciplines that included geology, botany, zoology, and meteorology. As Barbara Novak notes, nineteenth-century painters and scientists were united by “the desire to approximate the moment of creation itself” (Novak [1980] 2007, p. 41), which unfolded in the gaps “between historical and mythical time” (p. 42). Like the fossils and minerals excavated by geologists or the prehuman genealogies traced by Darwin, especially vistas of the natural sublime in nineteenth-century landscape art seemed to offer a glimpse of a primordial past, paradoxically even

the promise of a return or connection to a moment when the dividing line between the human and the world of elemental forces may have been more tenuous.

It seems that Ballard's landscapes provide a vision that is not dissimilar. The return of Triassic swamps in *The Drowned World* fuels the "metabiological fantasy" of an excavation of precognitive layers of "spinal and archaeopsychic time, recollecting in our unconscious minds the landscapes of each epoch, each with a distinct geological terrain" (Ballard [1962] 1997b, p. 44). Eighteen years prior to John McPhee's alleged first coinage of the phrase,⁴ Ballard invokes a "descent into deep time" (Ballard [1962] 1997b, p. 70) and heralds the human as geological subject long before Paul J. Crutzen introduces the Anthropocene as the defining environmental concept of the new millennium (Crutzen 2002). Especially *The Wind From Nowhere* allegorizes a radical upheaval of the relationship between human and ground. Unable to withstand the eponymous global storm of ever-increasing intensity, "the entire topsoil of the globe was being systematically loosened and windborne" (Ballard [1962] 1965, p. 225). While the lower atmosphere is transformed into a "[s]olid roaring wall of black air—except that it's not air any more but a horizontal avalanche of dust and rock" (p. 284), human survival relies on a retreat into the lithosphere, a "sub-world of dark labyrinthine tunnels and shafts" likened to "[t]housands of inverted buildings hung from street level [. . .] which now provided tolerable shelter, sealed off from the ravaging wind by the collapsing structures above" (p. 279). Quite literally, human civilization becomes sediment, sealed and buried under strata of rubble and ruin to be exhumed by future archaeologists as evidence of a planetary cataclysm. At the same time, conditions above the surface are determined by the sublime force of "[n]ature herself in revolt, in her purest, most elemental form" (p. 297).

In light of the fact that *The Wind From Nowhere* is the only one of Ballard's climate novels that does not include an explicit reference to the visual arts, I would like to propose a resonance with the work of J. M. W. Turner. Sometimes described as proto-impressionist, many of his paintings—for example "Snow Storm" (1842)—capture an atmosphere in turmoil, where form dissolves into an abstract rendering of elemental forces. In linking Ballard and Turner I am aided by Michel Serres, likely the most evocative and poetic twentieth-century cartographer of the passages between the arts and the sciences. In his programmatically entitled essay "Turner Translates Carnot," Serres celebrates Turner as the "first true genius in thermodynamics" (Serres [1974] 1982a, p. 57), whose tumultuous ocean-, smoke-, and cloudscapes visually anticipate the material conditions in Sadi Carnot's steam engine. For Serres, the central insight of thermodynamics, particularly with regard to its statistical reformulation by Ludwig Boltzmann in the 1860s, is that "beneath the forms of matter, stochastic disorder reigns supreme" (p. 61). In Turner's paintings he sees "totally new edges, which geometry and the art of drawing have abandoned, a new world [that] will soon discover dissolution, atomic and molecular dissemination" (p. 58). Like Turner's storms and clouds, Ballard's wind from nowhere materializes a new world characterized by the violent disintegration of form. Referred to as "holocaust" (Ballard [1962] 1965, p. 196) and "inferno" (p. 232), it leaves "the landscape [. . .] completely blighted" (p. 286), "shapeless and amorphous as a slag heap" (p. 250). At the novel's climax, the wind's "bare, unalloyed voice," like a "roaring Niagara of sound" (p. 296), creates a sensation as undifferentiated as its visual counterpart, "a white blur of flickering dust that crossed the screen from left to right, unvarying in its speed and direction" (p. 274). When Serres writes that "Turner gives himself over to brownian motion" (Serres [1974] 1982a, p. 58), we might recall its acoustic equivalent and compare Ballard's wind to what physicists and engineers know as white noise.⁵ While the analogy might

⁴ While elemental media theorist Durham Peters (2003) points to Stephen Jay Gould's *Time's Arrow, Time's Cycle: Myth and Metaphor in the Discovery of Geological Time* (Gould 1987) for the coinage of the term "deep time", Siegfried Zielinski, the author of *Deep Time of the Media* (Zielinski 2006), and Gould both point to the work of John McPhee (1982).

⁵ Famously analyzed by both Albert Einstein and Norbert Wiener, Brownian motion designates the seemingly random and disorderly movement of microscopic particles suspended in a fluid and is central to the insight of kinetic gas theory and statistical thermodynamics.

be inaccurate (primarily because the wind has a uniform direction), the underlying symbolism is the same: a return to a primordial chaos that articulates itself somewhere between the Brownian motion compared by Norbert Wiener to “Freud’s admission of a deep irrational component in human conduct and thought” (Wiener 1954, p. 11), and the “primary atomic cataract” envisioned by Lucretius (Serres [1977] 2000, p. 5). What *The Wind From Nowhere* foregrounds is the insurgence of a material, inorganic, and irrational world. I concur with Thacker that the novel is “really not about the human characters, but about the anonymous and enigmatic world-in-itself” (Thacker 2011, p. 88). Indeed, it is telling that the most memorable character is presented as a parody of anthropocentric delusions of grandeur. Hardoon, the creator of a giant pyramid who attempts to “outstare nature” fails spectacularly: “I alone have built upward, have dared to challenge the wind, asserting Man’s courage and determination to master nature. [. . .] If I fail, Man has no right to assert his innate superiority over the unreason of the natural world” (Ballard [1962] 1965, p. 298). In an ironic convergence of irrational Man and irrational World, his edifice topples and is swallowed up by a crack in the earth’s crust in what is described as “a cataclysmic convulsion” (p. 313). Soon after, the wind abates.

As the vision of an ambivalent catastrophe, *The Wind From Nowhere* unfolds in the gap of what Serres understands as the

distance between *turba* and *turbo*. The first designates a multitude, a large population, confusion and tumult. It is disorder [. . .]. But the second is a round form in movement like a spinning top, a turning cone or vortical spiral. This is no longer disorder, even if the whirl is of wind, or water or of storms. In fact, the turning shifting movement is that of the stars, of the heavens, now and originally. The world in its globality may be modeled by vortices. (Serres [1977] 2000, p. 28)

The distinction between complete chaos and the emergent order of a homeorrhetic system, such as a vortex, introduced by Serres in this excerpt from *The Birth of Physics*, sits at the crux of late twentieth-century articulations of complexity theory and pivots on a revision of the concept of entropy that comes with important implications for understanding the morphogenesis of both inorganic structures and biological organisms. When Serres calls living systems homeorrhetic, he highlights that ephemeral formations like vortices or organisms maintain their sameness (*homos*) by virtue of the incessant flows (*rhysis*) that traverse them (see Serres [1977] 1982b). Rather than in stasis, identity persists in flux. In one of the most comprehensive studies on the topic, *Into the Cool: Energy Flow, Thermodynamics, and Life* (Schneider and Sagan 2005), Eric D. Schneider and Dorion Sagan introduce a simplification of the second law of thermodynamics that circumvents its seemingly inherent eschatological undertones and resonates with Serres: “nature abhors a gradient” (p. 6). Observed through this lens, all dynamic systems are driven by the spontaneous tendency to eliminate differences, a process that under circumstances of extreme gradients—conditions far from equilibrium—can result in complexity and growth. As a prime example of what Nobel Prize-winning chemist Ilya Prigogine has popularized as “dissipative structures” (see Prigogine and Stengers 1984)—systems suffused by a perpetual stream of energy that grow more complex by exporting entropy into their environment—, the global cyclone in *The Wind from Nowhere* sustains itself by immense pressure gradients and the increase of entropy in its surroundings. In contrast to the idealized reservoirs of nineteenth-century thermodynamics, the planet, Ballard knows, is an open system. The wind is speculated to have received its momentum from the “gravitational drag” (Ballard [1962] 1965, p. 207) of “a vast tangential stream of cosmic radiation [that] exploded from the sun during the solar eclipse a month ago” (p. 206). Germinating from “localized areas of turbulence” (p. 223), it has evolved into a “highly stable aerodynamic system” (p. 206). In Thom’s words, local accidents of morphogenesis—the germ of a crystal, a genetic mutation, or the proverbial flap of a butterfly—transform into a “generalized catastrophe”—a crystallized forest, life, or a global hurricane (Thom [1972] 1999, 101 et seq.). Catastrophe is a liminal state between chaos and meta-stable order—*turba* and *turbo*—and Ballard’s landscapes stand in for entropic environments that spatialize precisely this limen. They are described as a “zone of transit” (Ballard [1962] 1997b, pp. 14, 35, 44, 91), “purgatory” (Ballard [1966] 2008, pp. 30, 83;

Ballard [1965] 2001, p. 146), or “waiting ground” (Ballard [1965] 2001, p. 146), where dissipation prevails and new morphologies emerge.

As noted above, with the exception of *The Wind From Nowhere*, all of Ballard’s climate novels come with pictorial avatars. In *The Drowned World*, the protagonist Kerans finds himself intrigued by the “self-devouring phantasmagoric jungles” of Max Ernst, the “spectral bonelike landscape” in a painting by Paul Delvaux (p. 29), and a “Dalinian landscape” with “immense sundials [stuck] like daggers in the fused sand” (p. 63). The final chapter of *The Drought* takes its title from Yves Tanguy’s painting “Jours de Lenteur,” whose “smooth pebble-like objects, drained of all associations, suspended on a washed tidal floor” foreshadow the characters’ increasing social isolation (p. 11). The first hardback edition of *The Crystal World* is adorned with Max Ernst’s decalomania print “The Eye of Silence” and the “heavy and penumbral” light in the vicinity of the crystallizing forest at the novel’s center motivates a comparison to Arnold Böcklin’s “Isle of Dead” (p. 13). Recalling that Ballard points to the landscapes of Dalí, Ernst, and others as “reflections of some interior reality within our minds” (Ballard [1963] 1997c, p. 200), one is inclined to infer from the artworks referenced in his novels that this interior reality is of an elemental, inhuman⁶ order. Embedded within the lineage of landscape painting, the surrealist tradition portrays an estranged environment no longer framed as the externalization of a rationalistic human gaze or a world-for-us. Just as the ego in the age of psychoanalysis is no longer the master of its own house, Earth becomes an alien planet. It may be obvious to point out that what the above paintings by Ernst, Delvaux, Tanguy, Böcklin, and Dalí have in common is their evocation of entropy and the virtual absence of human animation. Especially Tanguy depicts a world whose energy seems exhausted: Whitewashed dunes and a murky sky blend into one; grotesque abstract shapes half-submerged in what looks like dust are vaguely reminiscent of metallic consumer objects whose edges have been worn smooth and round by exposure to friction and heat. Literalized in *The Drought*,

forms seemed to have been eroded of all but a faint residue of their original identities, like ghosts in a distant universe where drained images lay in the shallows of some lost time. The unvarying light and absence of all movement made Ransom feel that he was advancing across an inner landscape where the elements of the future stood around him like the objects in a still life, formless and without association. (p. 181)

As if to level the “fractional tilt [that nature had applied] to the balance of the elements” (p. 37), the erosion of differences—or elimination of a gradient—may likely be the presiding metaphor of *The Drought*. Indeed, “the gradual numbing of sense and identity” is presented as a result of “the unseen gradient of the dune limbo” (p. 146). The lack of association and blurring of identity materialized in the inorganic environment of *The Drought* predicates a corresponding transformation of the human that is already anticipated in *The Wind From Nowhere*. Here the dissipative forces of the wind not only pick “like a thousand vultures at [. . .] girders and masonry” (p. 226), but also contribute to the attrition of the walls of subjectivity: “[T]hose still surviving confined themselves to the barest self-identification. In addition, there was the gradual numbness that had begun to affect everyone, a blunting of the sensibilities, by the filth and privation and sheer buffeting momentum of the wind” (p. 283). The coming of the dust announced in the opening sentence of *The Wind From Nowhere* is programmatic: The subject-objects of the future are blunt, dispersed, and atomized. Synecdochally related to the novel’s cyclone, dust is an elemental medium that connects the local to the global, the streets of London to the “alluvial plains of Tibet and Northern China” (p. 179), interstellar nebulae to geological sedimentation, reminding us that the climate crisis is an event that pays little regard to national, planetary, and physical boundaries. As both the ultimate entropic residue and a material testimony to environmental entanglement, “each particle of dust carries with it a unique

⁶ I here rely on Jeffrey Jerome Cohen, whose analysis of “the petric in the human and the anthropomorphic in the stone” draws on the concept of the “‘the inhuman’ to emphasize both difference (‘in-’ as in negative prefix) and intimacy (‘in-’ as indicator of estranged interiority)” (Cohen 2015, p. 10).

vision of matter, movement, collectivity, interaction, affect, differentiation, composition and infinite darkness,” as Reza Negarestani writes in *Cyclonopedia* (Negarestani 2008, p. 88). Like noise (from cosmic background radiation to Brownian motion), dust is equally a sign of the creation and the end of worlds.

Not surprisingly, dust is the defining medium in *The Drought*. Returning from a prolonged sojourn in his houseboat by the desiccated riverbed, the protagonist Ransom finds his former home featureless and blunted:

A light coating of dust covered the bodywork and lay on the seats inside, as if the car were already a distant memory of itself, the lapsed time condensing on it like dew. This softening of outlines could be seen in the garden, the fine silt on the swing-seats and metal table blurring their familiar profiles. The sills and gutters of the house were covered with the same ash, dimming the image of it in his mind. Watching the dust accumulate against the walls, Ransom could almost see it several years ahead, reverting to a primitive tumulus, a mastaba of white ash in which some forgotten nomad had once made his home. (p. 32)

As the natural water cycle is disrupted by a polymeric film covering major ocean surfaces—caused by industrial pollution—the resulting drought is exacerbated by an atmosphere suffused with smog and “dust columns rising into the sky from a landscape that seemed to be on fire” (p. 42). Formless and ubiquitous, dust is the primordial medium of “a new landscape emerging around them, [where] humanitarian considerations were becoming increasingly irrelevant” (p. 104). Over the course of his odyssey from the evacuated city of Mont Royal to the beach and back, Ransom embraces the increasing dissolution of social bonds as liberating. The future for him is one of “volitional time where the images of the past were reflected free from the demands of memory and nostalgia” (p. 217). The threads that bind his identity are progressively loosened; no longer can he embody his past as a tapestry of interwoven memories and relationships. It has “slipped away leaving behind it, like the debris of a vanished glacier, a moraine of unrelated mementoes, the blunted nodes of [. . .] memories” isolated and immobilized “like the fragments of archaic minerals sealed behind glass cases in museums of geology” (p. 12). Three years after the publication of *The Drought*, the land artist Robert Smithson—undoubtedly a close conceptual kin who cites Ballard as one of his influences in 1966 (see Smithson [1966] 1996b) and likely the twentieth century’s most evocative theoretician of the crystalline—celebrates the “sedimentation of the mind” and contextualizes his earth works in terms that may also be mobilized to characterize Ransom’s emerging geological subjectivity:⁷

One’s mind and the earth are in a constant state of erosion, mental rivers wear away abstract banks, brain waves undermine cliffs of thought, ideas decompose into stones of unknowing, and conceptual crystallizations break apart into deposits of gritty reason. Vast moving faculties occur in this geological miasma, and they move in the most physical way. This movement seems motionless, yet it crushes the landscape of logic under glacial reveries. This slow flowage makes one conscious of the turbidity of thinking. Slump, debris, slides, avalanches all take place within the cracking limits of the brain. The entire body is pulled into the cerebral sediment, where particles and fragments make themselves known as solid consciousness. A bleached and fractured world surrounds the artist. (Smithson [1968] 1996a, p. 100)

Let us recall that erosion is a dissipative process of not only destruction, but also formation, as already observed by Thoreau in the self-organizing capacities of sand on thawing riverbanks (see Thoreau [1854] 1960, p. 204). Smithson’s imbrication of mental and geological processes is vexing as it seems to point to disintegration and impending stasis, as well as to violent movement and the formation of a new consciousness that is less rational than it is glacial. With Ransom’s senses blunted,

⁷ The resonances between Ballard and Smithson have been addressed by Andrew Frost (2013).

his personality “stratified” (Ballard [1965] 2001, p. 49) and “detached” (p. 38), people mere “residues of themselves as notional as the empty river” (p. 112), and remaining social bonds increasingly granular, *The Drought* likewise introduces a new geological subjectivity that emerges out of the convergence of internal and external landscapes. Atomized like grains of sand, human characters become part of the anonymous collectivity of the inorganic world—isolated, yet entirely embedded. Like monads, each of them constitutes “a self-contained and discreet world of his own” while their inner landscape replicates the entirety of the exterior (p. 124). Rather than exclusively viewing this predicament as a bleak metaphor of entropic disassociation (the literalization of terminal thermal noise where each particle exists for itself and coordinated behavior is a thing of the past), I suggest we mine Ballard’s fiction in the age of the Anthropocene for reminders that the human has never been separate from the planet, that the externalization of the inorganic world as environment, resource, or landscape relies on the anthropocentric fantasy of a clear dividing line between inside and outside, atmosphere and sediment, local and global, subject and object.

3. Inhuman Life

The Wind from Nowhere and *The Drought* are premised on the all-encompassing restructuring of the planetary ecosphere, disrupting the relationship between human civilization and the natural environment to a degree that renders life increasingly precarious and on the verge of extinction. Yet, both novels end with a promise of renormalization: The storm subsides; the desperately awaited rain arrives. The complete merger of the internal and external landscape is stopped short by yet another unexplained meteorological whim. While *The Drowned World* and *The Crystal World* likewise portray “geophysical upheavals” that result in a radical estrangement of global climate conditions (Ballard [1962] 1997b, p. 21), readers are left with a more ambiguous outlook on the continuation of life amidst the transformed landscape. Both novels conclude with the suggestion of the protagonist’s full immersion in what is in both cases described as a “phantasmagoric forest” (Ballard [1962] 1997b, p. 169; Ballard [1966] 2008, p. 168), coded as a liminal existence between life and death, which, I suggest, not coincidentally reflects the ambivalent material properties of the surrounding medium. Whereas the lagoons and jungles in *The Drowned World* provide the background for an “immense profusion of animal life” (p. 53) and are bounded by a “dead terminal beach” (p. 168), the setting of *The Crystal World* is cast within a dialectic of a “new-found paradise” (p. 165) and the “crystal vaults” (p. 113) of an “unmade grave” (p. 134). As in *The Wind From Nowhere* and *The Drought*, this ambivalence can be traced to the inherent structure of the novels’ determining elemental novum. Specifically, the morphological properties and metaphorical valence associated with crystals are illuminating in this regard.

From the petrification of Lot’s wife, to the touch of Midas, and the stare of Medusa, crystallization enters Western mythology as a signifier of stasis and death. By contrast, modern art features the crystalline as a cipher for intricate symmetries, the multi-faceted fracture of shape and perspective, unsettling inorganic growth, and—particularly in cubist and futurist painting—vitality and animation. Interested in the resonances between scientific, artistic, and philosophical discursifications of the crystal as metaphor, art historian Mark Cheetham finds “[c]rystals [. . .] compelling because they are indexical of existential questions, poised at the crossing point of life and death. While their perfect forms appear lifeless, they suggest life because they ‘grow’ and move” (Cheetham 2010, p. 251). It is precisely this double-coding that underpins the crystallization of the world in Ballard’s fourth climate novel. Conspicuously described via the registers of a meteorological event—a “wave” (Ballard [1966] 2008, pp. 76, 88), a “storm” (pp. 78, 86), a “freeze” (p. 104), a “hurricane” (p. 77)—the wondrous transformation of the environment recalls both animate and inanimate processes. It seems not coincidental that the protagonist Dr. Edward Sanders is a physician specializing in the study of leprosy, but repeatedly mistaken for a dearly awaited physicist who has been requested to investigate the (geographically unspecified) African jungle area at the center of the novel’s narrative. In search of a vocabulary to describe the mysterious environmental transmogrification, Sanders’ expertise, it turns out, proves just as pertinent as that of a physicist. In contrast to explanatory schemata

borrowed from the physical sciences—“annealed prisms” (p. 97), “some optical or electromagnetic freak” (p. 148), the “proliferation of the sub-atomic identity of [. . .] matter” (p. 66), a “process of vitrification” (p. 86)—, Sanders represents a biomedical discourse through which the crystallization process is framed in comparison to “an outbreak of the plague” (p. 12), “cancer” (p. 66), “a virus growth” (p. 37), and “non-inherited mutations” (p. 65).⁸ Whereas the physical model foregrounds congealment and morphostasis, the biomedical or epidemiological perspective centers on anomalous growth and contagion. This conceptual ambiguity reflects two parallel frameworks by which the crystalline has entered the epistemic repertoire of modern science: as a paragon of the inorganic and inert in the lineage from solid-state physics to materials science, and as a model for organic morphogenesis and emergent complexity in microbiology and chemistry.

Honored with two Nobel Prizes (1914 and 1915), the structural analysis of crystals was pioneered by Max von Laue, Lawrence Bragg, and William Henry Bragg and constituted the birth scene of solid-state physics. Building on their research, x-ray spectroscopy has since ascertained that materials from rocks, to metals, and ice have similar internal structures: With the exception of glass, ceramics, and a few artificial alloys, inorganic solids are crystalline. What distinguishes their properties in the eye of the physicist is the ordered arrangement of their atomic constituents in a periodic lattice structure—a result of the minimization of gradients among the electrostatic forces at play. Even though the atomic binding energy of different solids varies across several decimal powers, and, hence, degrees of hardness, strength, and toughness can diverge significantly, the crystalline solid has persisted in the materialistic imaginary as an epitome for the permanent and the inert, owing perhaps to what German biologist Peter Sitte invokes as the association of too much symmetry with death (Sitte 1986, p. 58).

Yet, this trajectory represents only half the picture. Prior to developments in early twentieth-century physics, the German biologist Ernst Haeckel, author of the influential 1866 study *Generelle Morphologie der Organismen*, mobilizes metaphors of crystal structures to describe the intricate silicate skeletons of radiolarians in *Kunstformen der Natur*. To him, the radial symmetry of these unicellular organisms positions them at the limen of the organic and the inorganic, life and nonlife. In his final book with the programmatic title *Kristallseelen* (Haeckel 1917), Haeckel contends that “[t]he solid inorganic, stereometrically defined crystal, which hitherto had been generally considered lifeless and dead, exhibits real ‘life’ in the same sense as the simple ‘organism’ of the Protista kingdom” (pp. 9–10, my translation). Heralding a new monistic science of *crystallogics* (*Kristallotik*), he advocates for the conjoined study of not only crystallography, but also crystal physiology and what he in an almost proto-Ballardian gesture calls crystal psychomatics—“their inorganic soul life” (p. 2, my translation). In the context of neo-vitalist tendencies in nineteenth-century chemistry, this anthropomorphism seems not out of place, but the contrast to concurrent insights in solid-state physics could not be greater. It took another thirty years for a convergence of physics and biology in this regard. In 1944, the esteemed pioneer of quantum mechanics Erwin Schrödinger positions the crystalline solid at the core of his visionary account of the formation of living organisms. In light of the specter of Brownian motion and the increase of entropy prescribed by the second law of thermodynamics, he is stunned by the complexity and structural stability of the genetic molecule and draws on solid-state physics to suggest an explanation:

⁸ For perceptive readers of Ballard’s previous novels some of these tropes will not be entirely new. Already Donald Maitland, one of the protagonists in *The Wind From Nowhere*, is introduced as a biologist whose research focuses on “virus genetics—the basic mechanism of life itself” (p. 169). The eclectic recluse Lomax in *The Drought* is described as “a kind of supersaturation of himself,” who, “[s]uitably pricked, [. . .] would probably begin to deliquesce, fizzing out in a brilliant sparkle of contained light” (p. 50). In the same novel, Ransom grows wary of human company as “a meaningless replication of identity in which an infinite number of doubles of himself were being generated by some cancerous division of time” (p. 115). In *The Drowned World* “mutations” provide the cause for the proliferation of “freak botanical forms” and anomalous animal life (p. 22).

We wish a molecule to be regarded as a solid = crystal. The reason for this is that the atoms forming a molecule, whether there be few or many of them, are united by forces of exactly the same nature as the numerous atoms which build up a true solid, a crystal. The molecule presents the same solidity of structure as a crystal [and] it is precisely this solidity on which we draw to account for the permanence of the gene! (Schrödinger [1944] 1992, p. 60)

Preparing the ground for complexity theory and non-equilibrium thermodynamics, he famously describes the “organism’s astonishing gift of concentrating a ‘stream of order’ on itself and thus escaping the decay into atomic chaos” as “‘drinking orderliness’ from a suitable environment” (p. 77). The organism “feeds upon negative entropy [. . .] to compensate the entropy increase it produces by living and thus to maintain itself on a stationary and fairly low entropic level” (p. 73). In what he designates as the “‘order-from-order’ principle” (p. 81), he surmises that the homeorrhetic stability of the large-scale organism mirrors the crystalline quality of the genetic molecule.⁹ In analogy to self-organizing meteorological phenomena like hurricanes, the formation of complex organisms and spontaneous crystal growth are a testimony of far-from-equilibrium conditions and a function of the elimination of a gradient. “[I]n atomistic terms,” Donna Haraway lays out in her doctoral dissertation *Crystals, Fabrics, and Fields* (Haraway [1976] 2004), “the crystal is a smaller, simpler version of the organism in a nearly literal sense” (p. 11). The appeal of the crystal model to embryology hinges on the capacity of inorganic crystals to self-organize and grow. Crystals exhibit peculiar proximity to living systems when it comes to their apparent contradiction of the second law of thermodynamics. Statistically, the improbable arrangement of atoms in a regular crystal lattice mirrors the unlikely development of living organisms—both processes seem to feed on negative entropy. In *Entropy and Art* (1971), Arnheim explains:

[O]rderly form will come about as the visible result of physical forces establishing, under field conditions, the most balanced configurations attainable. This is true for inorganic as well as organic systems, for the symmetries of crystals as well as those of flowers or animal bodies. (pp. 6–7)

Under the right (field) conditions—a supersaturated solution, super-cooling, etc.—small impurities or an incipient crystal grain will serve as what is called the ‘germ’ of an indefinitely larger and periodic extension of the crystal lattice in all directions, analogous to the self-replication of cells in the early stages of organic development.

It is against the background of this scientific multiplication of crystal metaphors that I suggest we read the ambivalently coded crystalline existence in *The Crystal World* (cf. Ingwersen 2016). Immersion in the phantasmagoric forest promises both morphogenesis and morphostasis. Like “viruses [. . .] with their crystalline structure, neither animate nor inanimate,” Sanders anticipates that the entire world will soon be thrust into an ontological limbo—“neither living nor dead!” (Ballard [1966] 2008, p. 89)—a prospect that he envisions as “almost rejuvenating” (p. 88). Paul Klee’s invocation “how can I die, I who am crystal? I, crystal” (Klee 1964, p. 313) seems like an appropriate mantra for both the priest Balthus and Sanders, who abrogate the authority of their disciplines over life and death in face of the seduction of the crystalline. “I fear that the Church [. . .] may have outlived its function” (Ballard [1966] 2008, p. 162), Balthus admits not long before Sanders likewise concedes, “the whole profession of medicine may have been superseded—I don’t think the simple distinction between life and death has much meaning now” (p. 173). The specter of becoming one with the crystallizing

⁹ He presciently describes chromosomes as “aperiodic solids,” “which doubtless represent the highest degree of well-ordered atomic association we know of—much higher than the ordinary periodic crystal” (p. 77). Confirmed by Watson and Crick a decade later, this gesture allowed him to conceptualize mutations—the cause of which had presented a mystery since Darwin—as spontaneous quantum leaps between different stable energy arrangements. Through the tessellations of M. C. Escher and the aperiodic tilings of mathematician Roger Penrose, who praises Schrödinger’s *What is Life?* as “among the most influential scientific writings of this century” (Schrödinger [1944] 1992, Foreword), Schrödinger’s aperiodic crystal has, moreover, left a lasting impact on the geometric imaginary of the twentieth century.

environment is less one of destruction than of suspended animation—a return, even, to a prehuman inorganic consciousness. Symbolically reflected in the astronomical event of equinox, which provides the title of the first part of the novel, the crystal forest represents a mode of ontological indeterminacy whose lure Sanders expresses in a letter to a friend as the reflection of “an earlier period of our lives, perhaps an archaic memory we are born with” (p. 83). The character Ventress corroborates this view: “We’ve all been here before, Doctor, as everyone will soon find out” (p. 88).

Writing about the fecundity of the crystal as a metaphor in modern art, Wilhelm Worringer strikes a similar note in 1907 speculating that “the morphological law of inorganic nature still echoes like a dim memory in our human organism” (Worringer [1907] 1997, p. 35). With surprising frequency, the crystalline is cast as an atavistic materialization of both the posthuman and the prehuman. In both directions, the horizon of life, it seems, is crystalline. For the characters in *The Crystal World*, the physical journey into the depths of the jungle also becomes a journey into their psychic interior, a regression towards a phase of pre-subjective material individuation whose morphology ambiguously negotiates the threshold between the organic and the inorganic. The recognition of the morphogenetic or anabolic potential of inorganic structures suggests that underneath the layers of human subjectivity, “matter,” as Karen Barad notes, “is not is not a fixed essence; rather, matter is substance in its intra-active becoming—not a thing but a doing, a congealing of agency” (Barad 2007, pp. 183–84). It is along these lines that pointing to scientific imaginations of the crystalline at the core of living systems aligns with Ballard’s interest in meta-chemical and meta-biological concepts. Indeed, the transformation of the human in Ballard does not point at transcendence but rather at its re-immersion within a universal material milieu, or “prismatic medium” (Ballard [1966] 2008, p. 174). I suggest that we understand *The Crystal World* as an inquiry into the materialist disintegration of the human as the prevalent arbiter of living agency. The crystalline transformation of environment and characters is constitutive of a form of prehuman subjectivity that defies the boundary between life and death, organic and inorganic. Just as crystallization signifies the resolution of energetic tensions and the actualization of a previously latent form, and just as the recognition of the Anthropocene intimates a need to refashion human life in equilibrium with planetary ecologies, Sanders realizes that “[t]he only final resolution of the imbalance within their minds could be found within that crystal world” (p. 173). It is in this approximation of the living and the lithic that we might consider Ballard as a herald of precisely the hybridity that contemporary ecocritics leverage in their interrogation of anthropocentric distinctions between the human and its environmental medium.

In *The Drowned World* this medium is fluid. The climatological novum is not anthropogenic but caused by a “sudden instability in the Sun,” which “diminished the Earth’s gravitational hold upon the outer layers of the ionosphere” and increased the impact of solar radiation (p. 21). The result is a dramatic rise of global temperatures and sea levels that has transformed the northern hemisphere into a tropic waterworld of jungles and lagoons. Readers are introduced to the biologist Kerans as his expedition team is about to strike camp and leave the submerged cities of Europe for the safety of the Arctic circle. Yet, Kerans is hesitant about the prospect of departure. Probing his psyche in vain for “an adequate reason” (p. 28), he is tormented by “indecision” and “a state of tortured uncertainty” (p. 31). Ensnared by a sense of nostalgia for “the drowned world of [his] uterine childhood” (p. 28), he comes to regard the “forbidding and inviting [. . .] amnionic paradise” (p. 70) of his “jungle dreams” (p. 50) as the expression of “an ancient organic memory millions of years old” (p. 74). Reflected in Kerans’ fetishistic attachment to a confused compass, the envisioned return to a pre-subjective past is described as “a total reorientation of the personality” and hinges on an existential indeterminacy or state of limbo. “*Did I or I did I not try to kill myself,*” he wonders after a dive gone awry (p. 112)—a question that can be viewed as programmatic of the ontological implications of merging with the fluid landscape and which resonates with the ambivalent symbolism of crystallization in *The Crystal World*. Becoming landscape in *The Drowned World* is invoked not as annealment, but as molecular diffusion, a dissolution of the “temporary coagulations” of the human amidst a universal flow of matter (DeLanda 2005, p. 104). In Kerans’ dreams the lagoon’s waters become “an extension of his

own bloodstream” as he feels “the barriers which divided his own cells from the surrounding medium dissolving” (Ballard [1962] 1997b, p. 71). His vision of reconnection with an “archaeopsychic past” (Ballard [1962] 1997b, p. 45) is closer to *turbo* than to *turba*, no longer that of a homeorrhetic system suffused by flux yet individualized, but of pure immanence in the world’s material multiplicity prior even to the emergence of a gradient. This is not death, but a reunion with an anonymous life, or what Gilles Deleuze calls (capital) “A life [which] is everywhere, in all the moments that a given living subject goes through and that are measured by given lived objects: an immanent life carrying with it the events or singularities that are merely actualized in subjects and objects” (Deleuze [1995] 2001, p. 29). In Ballard’s climate novels, life is not reserved to the human, but a function of the material world articulating itself. What we encounter here is an extrapolation of the human as climatological agent, a radical abrogation of anthropocentrism that resonates in what contemporary materialist scholars have theorized as “human-lithic enmeshment” (Cohen 2015, p. 6), “thing power” (Bennett 2010, p. 6), “nonorganic life” (DeLanda 1992), or “geologic life” (Yusoff 2013, p. 779).

4. Inhuman Temporality

It is tempting to conceptualize Ballard’s visions of the world-without-us through the lens of a posthumanism in the lineage of Foucault’s man “erased, like a face drawn in sand at the edge of the sea” (Foucault [1966] 1994, p. 387). However, I would like to suggest a slight modification of this route. Gilles Deleuze and Félix Guattari, a frequent reference point in Anthropocene scholarship, locate the limit of all organization—human, meteorological, geological, ideological, hydrological—in what they call the “machinic phylum:” “matter in movement, in flux, in variation, matter as a conveyor of singularities and traits of expression” (Deleuze and Guattari [1980] 2011, p. 451). Against this backdrop, Deleuzian literature scholar Hanjo Berressem attends to modes of becoming fluid, molecular, or crystalline as articulations of a “critical prehumanism” (Berressem 2014, n. pag.). Building on Gilbert Simondon’s and Deleuze/Guattari’s recognition of crystal growth as the primordial model of individuation (see Simondon 1992; Deleuze and Guattari [1980] 2011), he suggests “that we, like every other living being, have always been machinic [read: Deleuze/Guattari’s machinic phylum] and that therefore, it is not a question of when we will become posthuman or whether we are already posthuman, but of the ways we have never been human” (ibid.).

Contained in this embrace of a prehuman subjectivity is a folding of temporality that readers of Ballard will know all too well. Ballard describes *The Drowned World*, *The Drought*, and *The Crystal World* as “a trilogy dealing with the topic of time” (Ballard [1968] 2014, p. 11). In spite of their apparent division into a predominant concern with the past, future, and present, respectively (ibid.), all of the three novels ultimately herald a world “where the nominal realities of time and space ceased to exist” (Ballard [1962] 1997b, p. 83). The beach in *The Drought* is “a zone without time” (p. 174); “the super-saturation of matter” in *The Crystal World* raises the specter of a universe from which “all time has expired” (p. 85). Reading Ballard’s climate novels in dialogue with the paradigm of the Anthropocene might mean to understand this alienation of time as precisely a function of the re-embedment of the human within inorganic time-scales of geological, molecular, and even cosmic proportions. As Monika Bakke writes,

[r]ecalibrating our own scale, the scale of individuals and species, to the geological scale, brings a better understanding of our own bodily entanglements with autotrophic and heterotrophic metabolic systems; rearticulating materiality in ways not yet fully comprehended and not fully predictable. (Bakke 2016, p. 59)

In strikingly similar words, Ballard describes Kerans’ alignment with geomorphic forces as entering a world “where the massive intervals of the geological time-scale calibrated his existence” (Ballard [1962] 1997b, p. 48). As a literary model for the type of emergent geological subjectivity invoked by Bakke (also cf. Latour 2014), the protagonist of *The Drowned World* perceives how

[e]pochs drifted. Giant waves, infinitely slow and enveloping, broke and fell across the sunless beaches of the time-sea, washing him helplessly in its shallows. He drifted from one pool to another, in the limbos of eternity, a thousand images of himself reflected in the inverted mirrors of the surface. (p. 110)

As if refracted through a crystalline prism, human subjectivity is fractured by inhuman time-scales, simultaneously inhabiting the past, future, and present. Arguably, this is precisely what lies at the root of announcing the human as the namesake of a new geological epoch: a con-fusion not only of human and geological ontologies, but also a con-fusion of time. Attuning the human to geological time-scales implies a heightened sensitivity to both the glacial temporality of moving mountains and tectonic plates and the speeds and abrupt formative processes of elementary particles and atmospheric molecules (cf. Barad 2017). In what came as a challenge to the fatalistic linearity inscribed in early articulations of the second law of thermodynamics, chaos and catastrophe theory learned from meteorology that minute local events can have large-scale global effects and that the direction of time does not necessarily correlate with the inevitable disintegration of form. In this light, the Anthropocene can be understood as less a statement about the present than as an articulation of the intersection between past, present, and future. It inscribes the human as always already prehuman—inorganic, fossilized, and part of a morphogenetic process whose scale far precedes and exceeds the ‘temporary coagulation’ of the human. In light of this “mineralogical dimension of human composition,” Kathryn Yusoff raises the question, “How do we speak of deep time and inhuman beginnings within the context of these Earth forces in ways that offer a generative politics of minerality, rather than one of unilateral destruction?” (Yusoff 2013, p. 780). In response, I would like to point to Ballard’s climate novels and suggest that the climate catastrophes they portray are examples of precisely not unilateral destruction, whether of the human or of the environment, but of the generative capacities of the material world, bridging and bringing to the fore the spatiotemporal scales of molecular and meteorological morphogenesis, geological time and cosmic time.

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