

Humans as Ecological Actors in Post-Apocalyptic Literature

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Abstract: Post apocalyptic literature is frequently environmental in nature, or explores significant ecological impacts. These affect the surviving human and nonhuman populations, and are characterised by scale. While some of the apocalypses of science fiction literature are limited to the destruction of a single species—as occurs, for instance, in P.D. James’ *The Children of Men*—others, such as Cormac McCarthy’s *The Road*, illustrate an environmental collapse that destroys entire ecosystems. Human response to apocalypse occurs on both an individual and a communal level, but that response, within the literature, tends to focus more often on social or economic consequences. However, humankind’s ability to further shape its natural environment tends to be heightened in environmental apocalypse, as compromised ecologies become ever more vulnerable to human activity. The human ability to function as ecological actors, as shapers of surviving ecologies, is therefore not only a fundamental—if frequently underexplored—part of that narrative, but it also indicates potential pathways for real-life response to ecological apocalypse. Notable in the post-apocalyptic narratives explored in this paper is the way that the impact of human behaviour on environment is dependent on apocalyptic scale. The construction of *refugia*, the realignment of surviving communities to sustainable practices, and the increasingly destructive human presence on ecologies incapable of reclamation contrasts with, for example, the increasing nonhuman biodiversity that can follow the widespread destruction of the human population.

Keywords: ecological actors; *The Children of Men*; *The Road*, *The Day of the Triffids*; refugia

Post-apocalyptic fiction imagines a future where humanity’s survival is threatened by ecological collapse. By examining human relationships with the post-apocalyptic environment, we explore the concept of humans as ecological actors, able to impact—either positively or negatively—the natural world in the wake of disaster. This impact is affected by both the scale of the apocalypse and the role that humans choose to play in this new world. Does that role differ from ecological action *pre*-apocalypse and what does that say about how we envision, through post-apocalypse, our possible future relationships with the environment?

The type of apocalypse depicted in any given work is the deciding factor in this relationship. A nuclear war, for instance, severely affects entire ecosystems, and so the interaction between surviving organisms is particularly marked. In very quiet, almost localised apocalypses, however, the scope of that interaction is minimal. Consider *The Children of Men* by P.D. James,

which frames its apocalypse within the context of human infertility. “Overnight, it seemed, the human race had lost its power to breed,” a phenomenon which could almost be considered localised if restriction to a single species counts as localisation (James, 2006, p. 9). Yet even here, the consequences of such a restriction are not insignificant: although mass infertility affects the human species alone, the disappearance within several generations of the global apex predator is bound to have repercussions for the surviving species. Sudden, marked decreases in pollution, in agriculture, and the oncoming cessation of all anthropological interaction with the environment can have no other result. But because this apocalyptic infertility is so species-specific, and so relatively slow, it is possible for many individuals to go on living in much the same manner as before. In fact, James is so focused on the social and political ramifications of the end of the species that she spends little to no time perceiving the surviving humans as ecological

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actors, capable of significant alterations to, and interactions with, their own environment.

The sole example of ecological action in *The Children of Men* is concerned with leisure. This differentiates the novel from much of post-apocalyptic literature in that the resources necessary for survival—food, clean water, adequate shelter—are easily obtained. Survival, such as it can ever be in such circumstances, is primarily cultural. The contents of museums and galleries are stored safely away in case aliens ever arrive on Earth to explore the remains of a long dead civilisation, but the remainder of the population is concerned primarily with an easy senescence. Why spend the last decades of the apocalypse in conflict and uprising when golf can while away the remaining hours? Productive and entertaining leisure is thus seen as a means of mitigating the social upheaval of apocalypse, and the frantic construction of ever-more complicated golfing greens a social good. The protagonist, Theo, notes that if human reproduction had continued uninterrupted, “conservationists would protest at the acres of countryside, some of it our most beautiful, which have been distorted and rearranged” in the service of golf, but this is a throw-away detail (James, 2006, p. 8). More telling is a priest’s hysterical reaction when a deer wanders into his church: “The chaplain had turned to Theo, tears streaming down his face. ‘Christ, why can’t they wait? Bloody animals. They’ll have it all soon enough. Why can’t they wait?’” (James, 2006, p. 41).

Notably, this awareness of nature’s indifference is also depicted in John Wyndham’s novel *The Day of the Triffids*. After humans are almost universally blinded, a state which is acknowledged within the text as inevitably leading to an apocalyptic loss of population (an apocalypse that, as in *The Children of Men*, is restricted to a single species), the focus shifts to triffids. Previously a vegetative curiosity, the triffids’ ability to hunt and kill blinded prey points to a different world—one which alters existing ecologies by replacing one apex predator with another. Stock describes triffids as a “biological competitor” with hu-

mans, but the outcome of this contest is the realisation that humans are biological competitors as well, and with more than just triffids (2015, p. 446). With the removal of the human population, other species fill the vacant ecological niches that humans were previously more effective at exploiting. The simple observation of roads overgrown with weeds, of plants encroaching on towns, of human artefacts such as houses falling to decay, eventually being covered over with trees and flowers, is a pointed one. “It’s as if everything were breaking out,” Josella comments, recalling that even a few years before apocalypse, complaints about how growing towns were ruining the surrounding countryside were rife. This leads to the perception of ecology “Rejoicing that we’re finished, and that it’s free to go its own way” (Wyndham, 1975, p. 242). That is, of course, an anthropomorphic assertion, but it is one that implicitly places human as ecological actors and acknowledges, therefore, the environmental effects of their absence. “Nature has been through worse losses before, and refilled empty niches,” comments Weisman in his study, *The World Without Us*. That the natural response to loss may manifest in, for example, an increase in biodiversity, is an observation about human actions as much as it is the non-human response to those actions (2007, p. 5).

In books like *The Children of Men* and *The Day of the Triffids*, then, the natural world is something to be quietly resented for its ability to survive (even flourish) in a post-apocalyptic setting when humans cannot. Even the manic creation of golf courses and housing is a relatively minor ecological action, as the foreseeable absence of upkeep will quickly return the greens to woodlands. These actions, in such localised apocalypses, are relatively ineffectual, and the implicit acknowledgment of this is apparent in the sociocultural as well as the ecological responses to apocalypse.

When the apocalyptic scale is increased such that it directly and immediately impacts entire ecosystems rather than a single species, however, hu-

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manity's ability to function as significant, long-term ecological actors is affected. Clasen asserts that "The most common stance towards apocalypse is ambivalence," but this is a statement predicated on the ability to work through apocalypse, and it only applies when that apocalypse is partial (2019, p. 73). The return to the land, eschewing technology to live a more pastoral life, for instance, assumes that such a life (however idealised) can still be managed. Yet as the scale of apocalypse increases, ecosystems become increasingly vulnerable, and the effects of human actions on those ecosystems become more apparent... and ever more indifferent.

When the literary apocalypse is severe enough, humanity's ability to take significant ecological action is further reduced, as is the case in post-apocalyptic environments where the ecological destruction is so devastating, so all-encompassing, that human survivors can neither mitigate that destruction nor really make it any worse. A post-apocalyptic narrative of this type is depicted in Cormac McCarthy's novel *The Road*. Here, a small number of humans survive as predators—at least in the short term. With lack of clean air and sunlight destroying the terrestrial ecosystem, however, plant and animal life is minimal; the human survivors have largely resorted to eating one another. This is a fairly closed system, however. Although children are still being born, albeit at very low rates, and often simply to be eaten—with characters observing "a charred human infant headless and gutted and blackening on the spit"—unless new ecological resources are created or discovered, the human population will soon die out (McCarthy, 2007, p. 212). Starvation amongst the few survivors is already common as the supply of canned goods continues to dwindle with little hope of producing more.

Altered climate, and the continual presence of ash from a fiery holocaust, results in a "cauterized terrain" where everything has burned, making breathing difficult (McCarthy, 2007, p. 13). The man and the boy of *The Road* must wear cotton masks over their faces in an attempt to filter out the worst of the ash.

This is clearly an ineffective measure, however, as the man is plagued by lung problems, continually coughing up blood: "In the night he woke in the cold dark coughing and he coughed till his chest was raw" (McCarthy, 2007, p. 186). This condition eventually kills him, giving readers the impression that breathing troubles are likely to be widespread amongst the remaining population. Ironic in light of our current moment, wearing masks is certainly a universal practice in this world, and indicates humanity's long-term inability to survive the harsh environment. There is nothing "ambivalent" about this apocalypse. It is the destruction of nearly all plant and animal life, and it is unmitigated horror.

Although interaction with the remaining ecology is constant, with the man and the boy walking along a road headed south to escape the northern winters, they cannot really be said to be ecological actors, and neither can their compatriots. With small exceptions, such as the discovery and consumption—and potential total destruction—of the only observed surviving morel mushrooms, and the optimistic preservation of packets of flower seeds, the direction and scale of ecological interaction is almost entirely one-way. The burned environment materially affects the few survivors, destroying their lungs and depriving them of resources, but there is very little that those survivors have done or can do to make any further material impact on that environment. The apocalypse has been so total that their capacity to further influence ecology is minimal.

When the destruction is not total, or only near-total, the human capacity for ecological action may be restored, as illustrated in Robert C. O'Brien's young adult novel, *Z for Zachariah*. Here, apocalypse has made the Earth a poisoned wasteland, too radioactive for organisms to survive. But in a distant valley, one isolated by a quirk of microclimate—"the valley had its own weather [...] A meteorological enclave"—a teenage girl is able to survive (O'Brien, 2007, p. 56). And she is not the only one to do so—there are also cows, chickens, and a dog. Fish still survive in an un-

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contaminated spring. There are birds and apple trees and she is able to live comfortably on her family's small holding.

While Ann's life is constrained by the limits of the valley—she literally cannot leave it without assuring her death—her life within it is not horribly marked by apocalypse. She has enough to eat, a safe house, and supplies to make her life easier. There is no electricity, and she feels the lack of books keenly, but her standard of living, while lowered, is not significantly so. Her experience of ecological apocalypse is significantly more observational than it is experiential: "I have climbed the hills on all sides of this valley, and at the top I have climbed a tree. When I look beyond, I see that all the trees are dead, and there is never a sign of anything moving. I don't go out there" (O'Brien, 2007, p. 9). She can observe the surrounding devastation but lacks the interactive relationship with post-apocalyptic landscapes that the man and the boy of *The Road* have, for example.

Within the valley, however, Ann is able to take her place as an ecological actor. She farms, she takes care of the animals, and she clears new ground for planting. That her ecological actions are primarily directed to maintain the stability of her environmental refugia is clear. As one person working alone, she can't maintain the same level of ecological action as the previous valley residents did together, but she works to maintain an actively ordered environment in the wake of environmental devastation.

In contrast to Ann stands John Loomis, who arrives on her farm wearing the only effective radiation suit in existence, taken from the isolated laboratory where he was working during the apocalypse. The suit's plastic material is also capable of filtering air and water, as well as protecting food from radiation. The suit offers freedom of movement in an absolute absence of ecosystem, but it is also a means of completely insulating oneself from the decimated environment. Loomis "is dressed, entirely covered, in a sort of greenish plastic-looking suit. It even covers his head, and there is a glass mask for his eyes—like the wet suits skin divers

wear in cold water, only looser and bulkier. Like skin divers, too, he has an air tank on his back" (O'Brien, 2007, pp. 18-19). The separation is so complete that the capacity for any sort of ecological action is impossible. Traveling through the radioactive wastelands, encased in his suit, he is a distanced observer in a way that Ann is not.

Loomis's active refusal to engage in his role as ecological actor in the blasted post-apocalyptic environment is a practical one, based entirely on the limits of biology. Outside of Ann's refugia, he would die without the suit. Yet this absolute isolation is more than physical. There exist a number of post-apocalyptic narratives in which the refusal to truly engage with the idea of people as part of an ecosystem turns characters into cultural observers rather than people who genuinely live in a post-apocalyptic environment.

After a global pandemic and climate change crash, the world in *Clade* by James Bradley collapses. But while the world deals with drought and crop failure in Southeast Asia, economic collapse and rioting in India, the loss of island communities due to ocean levels rising, and cities burning in China and India after the plague, the characters, living in Australia, Antarctica, and Great Britain, are deliberately removed from the materiality of these events. Post-pandemic, their countries still have trains, water, Internet, and power. The government stands unchanged. There is little fear, limited military presence and limited social breakdown, and there are no shortages or conditions for starvation. The most serious consequences of life in a post-apocalyptic world happen at a distance, and to other people. This is Ann and her little farm refugia on a larger scale, insulated from the effects of apocalypse.

Anthropogenic climate change is an excellent example of humans as ecological actors, significantly affecting the environment by their actions, and yet the consequences of these actions, when so very distanced, remove the capacity for ecological action from the very characters highlighted by the narrative. They become observers of ecosystems rather than

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active participants in them. There are frequent moments when the characters could be presented as part of an ecosystem, but instead take on the role of observers: Adam in Antarctica, listening to the glaciers shattering; Tom mourning the inevitable loss of the birds; Ellie making art out of the nearly-extinct bees. And Noah, who looks away from the ecology completely, searching the universe for signs of life, denying any connection to his failing planet at all. This ability to observe at a distance, to be somehow exempt from the post-apocalyptic ecosystem, is a genteel, middle-class attitude of phenomenal privilege which is never really challenged in the novel. Humans cannot be independent observers of ecology. They are, and always have been, part of it—even if their role is to change and destroy. People do not live environmental bubbles, distinct from the interconnected systems around them. Though it is certainly possible to observe an ecosystem from within that ecosystem—scientists do it all of the time!—the impact of human presence is ongoing and bidirectional. Humans affect ecosystems, but they are also affected by them, and a post-apocalyptic narrative that ignores this fundamental interconnection risks presenting an unconvincing argument.

Denying or underplaying humanity's role as ecological actors is an implicit disinclination to action. If humans are incapable of significantly affecting the environment, if they are incapable of being significantly affected by it in turn, then they become passive bystanders both to ecosystem and to apocalypse, as they are in *The Road*. Increasing emphasis on independent observation and increasing distance from meaningful engagement with the environment subsequently *decreases* incentive for action. Conversely, in narratives where the characters are fully aware of their roles as ecological actors in post-apocalyptic landscapes, that awareness and understanding encourages deliberate environmental action. The belief that humans can both be significantly affected by their ecosystem *and* significantly affect that ecosystem in turn invests actions with meaning and motivation rather than futility and ecological isolation. Most

interesting in Bradley's portrayal of the apocalypse is that the characters' attitudes toward the ecology remain the same. The impending apocalypse doesn't make them alter their consumption of resources, or prompt them to reduce their waste, or even encourage them to look deeper into the ecology as a means for future survival. At no point is their culture or interaction with the natural world questioned, other than to note the impact that humans make upon it.

This is not an isolated example. In all of the texts examined, only a small number showed the apocalypse changing the way that characters acted, or their attitude about human-ecological interaction. The concept of a resilient socio-ecological system is rarely considered in post-apocalyptic texts. The struggle is a physical one—human versus environment—not a cooperative one.

Consider the presentation of humans as ecological actors in John Wyndham's novel, *The Chrysalids*. Here, ecological interaction with the environment is a religious duty. In the wake of nuclear war, genetic mutation has significantly increased and, in the small rural communities that make up the illustrated society, marks divine displeasure. These ongoing mutations are thus perceived not as a result of exposure to radiation, but rather as a continuation of punishment and a measure of atonement both. This spiritual chastening process began with the nuclear war itself, which has been socially and religiously re-interpreted as Tribulation, a divine response to the disobedience of humanity.

The remaining population is exhorted to "WATCH THOU FOR THE MUTANT!" (Wyndham, 2001, p. 18). It is the duty of every individual to monitor plants and animals for deviations from an established norm. These deviations are destroyed, and their remains burned so that they are unable to reproduce, thus halting the transmission of the genetic mutation through the population. This same eugenics-based approach is also observed in James's *The Children of Men*. The infertility that dooms the human race is constantly monitored, with monthly gynecological

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checks for women thought to be of childbearing age. Exempt from these checks are those women who are considered to have mental or physical abnormalities. As Weiss points out, however, the pregnancy at the centre of the novel belongs to a woman who has a congenital malformation of her left hand, and “the new human species will evolve from what the [governing] regime has hitherto considered genetically impure material” (2018, p. 157). The desire to control reproductive access and characteristics, and to introduce the spectre of eugenics into both human and nonhuman breeding, is an element of control that can frequently undermine long-term population health in favour of ordered, short-term benefits. Darcy notes, specifically, that “the question of fertility and reproduction ... [is] bound up in a dormant political power that is simply waiting for an opportunity to exert its control” both over scientific institutions and the population in general (2013, p. 94). This control over reproduction, then, is such that it repositions the human body as a biological—and ecological—resource. Humans, already existing as part of an ecology, can therefore also be seen as subjects within that ecology, able to be manipulated just as other elements of the ecosystem are manipulated.

The ecological results of such thinking are illustrated in *The Chrysalids*, where mutants are sterilised and, if human, exiled, to ensure the removal of their deviation from the gene pool. It is notable that this society has no understanding of the science behind these mutations or the benefits of selective breeding; they are potentially harming that society in the long term by reducing genetic diversity and making themselves vulnerable to disease or sudden environmental changes. With this constant monitoring of biology, mutations are slowly phased out of the local ecology over a period of years.

Ours was no longer a frontier region. Hard work and sacrifice had produced a stability of stock and crops which could be envied even by some communities to the east of us. You could now go some thirty miles to the south or south-west before you came to Wild Country—that is to say parts where

the chance of breeding true was less than fifty per cent. After that, everything grew more erratic across a belt which was ten miles wide in some places and up to twenty in others, until you came to the mysterious Fringes where nothing was dependable, and where, to quote my father, “the Devil struts his wide estates, and the laws of God are mocked.” (Wyndham, 2001, p. 20).

Far from removing themselves from ecological responsibility, the communities of *The Chrysalids* consider themselves morally responsible for their interconnected environment—an environment which includes humans as part of the biology to be controlled. Any deviation from the norm is failure on society’s part, but that society has no objective way of determining whether a deviation has been caused by the excess radiation of Tribulation, or by another natural or normal process. Their idea of stewardship is to transform the ecology of which they are a part into what they consider the ideal, and then to freeze it there. Their understanding of human ecological agency, then, is seen solely through the twin lenses of control and license.

The characters in *The Chrysalids* act from a position of religiously derived scientific ignorance. But when the same control is apparently justified by science, the consequences for both humanity and ecology are startlingly similar. Ecological control is the primary lens in the short fiction piece, “Utere Nihil Non Extra Quiritationem Suis” (later published separately as *Everything but the Squeal*), by John Scalzi. In a world where climate change has decimated the productive capacity of the USA, ecological ideals are driven by the guilt felt for humanity’s impact on the world. New St. Louis is a city founded on the principle of zero impact: on the idea that every product or waste material should be recyclable, and that every part of an animal is usable. All of the city’s resources are focused on this goal—including its human resources. Every citizen must contribute to the city. There can be no waste in any system, including the education system. All high school graduates must take a test to determine their job suitability, which

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they are assigned. Personal choice does not matter. Those who refuse to take the test by the age of twenty are evicted from the city, into the un-ecologically-controlled lands outside of the walls.

This is a particularly interesting aspect of the narrative, as it relies upon the idea that New St. Louis, inhabited by several million people, exists separately from the surrounding environment. For all of its emphasis on ecological responsibility and the implicit understanding that humans are significant ecological actors, the depiction of New St. Louis' relationship with the ecological other is one of extraordinary disconnection, especially in the light of studies such as that by Tüzün, which re-imagine urban ecology as "fertile sites of inter-species encounters which allow new possibilities to emerge" (2018, p. 190). The determined withdrawal from ecology, especially urban ecology, is simultaneously an attempt to exert consistent and complete control over a limited ecological space, and an acknowledgment of a complete lack of ecological control outside of that space.

This is exactly the situation in *Chrysalids*. Two narratives, written decades apart, approaching the ecology from two different directions, have come to the same end. And is one approach more or less successful than the other? Both communities are thriving in their own ways from the point of view of the human actors. And both communities interact with the ecology in the same way—control within a designated area, fear of the world outside of the control zone, and expulsion for those who do not belong. Are these the only roles that humans can play: the victor or the victim?

There is a third role in many of these post-apocalyptic works, that of the scavenger. Represented by the inhabitants of the Fringes in *The Chrysalids*, this role takes from the community without any attempt at management or reciprocity. McCarthy's characters in *The Road* are the same, taking from the environment and each other without regard for any long-term, sustainable relationship. Immediate survival and fear have overridden any possibility of a more calculated and long-term relationship.

From one perspective, this could be driven by the characters' vulnerability to the ecology. But in *Lotus Blue* by Cat Sparks, we see an example of a deliberate withdrawal from any action on, or relationship with, ecology, similar to the withdrawal of the citizens of New St. Louis. But where the characters of New St. Louis are self-reliant, the fortress dwellers in *Lotus Blue* are not—they have no way to support themselves within the city and no way to repair the failing technology on which they depend. They trade with the people outside of their walls and are entirely dependent on them as a third-party interaction with nature. But theirs is a parasitic lifestyle; their deliberate withdrawal from the shattered ecology outside is an interaction that, like McCarthy's characters, can only end in extinction.

These fortress dwellers exist in direct contrast to the free people outside of the fortresses. At the mercy of the ravaged land, water shortages, and the advancing desert, they lack the technology to control the ecology and struggle to exist in the environment that they inhabit. Much like the characters in John Christopher's *The Death of Grass*, for example, they band together for survival, but in a much less aggressive way. They do not murder for dwindling resources, but instead work together to improve the survival chances of all, though in a less rigid manner than *The Chrysalids*.

These stories by Wyndham, Scalzi, and Sparks exhibit three different mindsets: one aims to extend control over the ecosystem, gradually rehabilitating marginal environments to improve their suitability for human survival, while another aims to strictly limit that ecosystem, projecting control over a rigidly defined geographical area. The third tries to use another rigidly defined area as a place to avoid the idea of ecological action as much as possible. And yet, in these very different communities, the effects on the human population are the same. In the first two examples especially, those who conform to the values of the community stay within the desired ecosystem of that community. Deviation results in eviction from the desired ecosystem. This ensures

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the survival of both ecosystem and community. And in both *The Chrysalids* and “Utere Nihil Non Extra Quiritationem Suis,” humans in the world outside of controlled ecosystems and communities struggle to meet basic needs because they lack sufficient capacity as ecological actors. Perhaps this is because they lack the skills needed to adapt the environment to their own needs, or perhaps the environment is so degraded that no short- or medium-term ecological action will make it significantly more habitable. In *The Chrysalids*, residents of the Fringes have to survive by raiding, for instance, as the lands they inhabit are too radioactive to support either hunting or subsistence farming.

From an ecological point of view, there is a clear tension between the exertion of control and the difficulty of maintaining a closed system. Clearly not all controlled ecosystems will be closed, but the strain of existence in a post-apocalyptic landscape often increases the perceived need for ecological refugia such as New St. Louis. The tighter that control, however, the more isolated a specific ecosystem is from the outside environment... and the less likely that specific ecosystem is to prove resilient and long-lasting.

Molly Gloss explores this tension particularly well in her novel *The Dazzle of Day*. Here, a community of Quakers leaves Earth in an attempt to colonise a distant planet. *The Dazzle of Day* is less apocalyptic in its beginning than pre-apocalypse, but the migration essentially takes place to avoid the apocalyptic environment that the Quakers can see coming. In the opening chapter, Dolores admits, “I had become afraid I would live long enough to see the end of the world” (Gloss, 1997, p. 13). War and environmental devastation are making the community’s existing North American settlement increasingly untenable. “*What happens, happens*, people frequently say, meaning not only murder and rape on the roads but death by plague or by cancer, which seem in these days to be distilled from the very air and water” (Gloss, 1997, p. 12). *Dazzle* gives introductory accounts of satellite refugia, havens of constructed

ecology in orbit, but because an orbiting station is fundamentally a closed system—deliberately so, as the wealthy clamour to remove themselves from the Earth’s failing biosphere—these ecologies lack resilience and ultimately fail.

With the first of these toroids it was something like that, the one named *Crommelin*, built for the rich man Jon Crommelin, a scrupulously beautiful, flauntingly private refuge put to circling the earth just above this poisoned sky, every grain of earth disinfected, every person and object sterilized, unpleasant insects and reptiles shut out. In a year, less than a year, there was a collapse of the organic life, and the dead construct was abandoned.

(Gloss, 1997, pp. 9-10)

The need to control all aspects of ecology certainly makes Jon Crommelin an ecological actor able to create his own closed and perfect environment, but his actions are ultimately and spectacularly unsuccessful. Increased control coupled with inadequate ecological knowledge increases the vulnerability of ecosystems. The Quakers realise this, and their colony ship, the *Dusty Miller*, contains an enormous—and enormously complex—range of species and ecosystems that must be constantly maintained in order to remain viable. Even then, humans must take on different ecological roles when the unexpected happens: “When the cats had taken a plague and died, people had found they must act as keystone predators of some species, and this killing was part of Ridaro’s work” (Gloss, 1997, p. 114).

The *Dusty Miller* is able to survive several generations of space travel because the humans inhabiting its closed system never, not even for a second, forget their roles as ecological actors. Should they forget, the contained environment would fail, and survival for every organism on board would be jeopardised. In this way, the colony ship is something of a metaphoric mirror for the people left behind on the spaceship that is Earth. Forgetting their role as ecological actors, they continue to exploit and degrade, continually lowering the carrying capacity of the planet until, we can surmise, it finally becomes uninhabitable.

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The message is clear: only those who are continually conscious of their roles as ecological actors are capable of sustained and resilient community-building. The ecological actors in *The Chrysalids*, by contrast, are equally as continually conscious, but through their destruction of viable mutations, are actually increasing long term ecosystem vulnerability by decreasing genetic diversity. Both communities are engaged (or will be engaged) in what is essentially terraforming. Whether on a devastated Earth or on a distant planet, their desire to shape their environment is the result of a shared communal ideology. As Pak states, in their study on terraforming in speculative fiction, “The fundamental question asked is how we want to live, and it emerges from the concern over whether we can continue living in ways that threaten the integrity of our environments” (2016, p. 17).

Both the Quakers from *The Dazzle of Day* and the community of *The Chrysalids* are cohesive social communities, guided by religious fundamentalisms that embrace and reject diversity, respectively. Community is a powerful survival tactic in the face of ecological instability, and not all post-apocalyptic narratives rely on communities as a survival method. The main characters of *The Road*, as previously mentioned, are determined in their avoidance and distrust of outsiders, and they are not the only ones. Christopher’s *The Death of Grass* was written during the rising eco-consciousness of the 1950s—the same era that resulted in *The Silent Spring* (published in 1962) and the subsequent rise of the anti-pesticide movement. Christopher imagines the destruction of every staple grain for human existence within a matter of years, and their absence causes massive famine and conflict. Post-apocalyptic narratives tend to prioritise the human experience, viewing other species through a utilitarian lens, and the novel “depicts appeals to protect the environment as predicated upon the notion that plant life is a resource subordinate to and serving human civilization, rather than as a life form worth preserving for itself” (Matthews, 2016, p. 123). This is something also noted by Vičaka in their comments on *The Road*: the novel “offer[s] a promise

of redemption when humans realise that nature has to be saved to prevent extinction on a global scale” (Vičaka, 2015, p. 77). There is something intensely self-serving about such a redemption. Although Vičaka talks about a “global scale” in comparison to Matthews, who refers to the argument for “serving human civilization,” there is no doubt that human survival is the centre of both justifications. While this prioritisation is understandable, it tends to limit potential ecological actions by human protagonists to those that will directly benefit either themselves or their immediate communities. With rare exceptions—such as in Gloss’s *The Dazzle of Day*—recognition of inherent value in nonhuman life is lacking. This determined self-interest is often reflected in social organisation, which mirrors the exploitative environmental systems highlighted by apocalypse.

For example, the larger communities of city, town, and even village promptly disintegrate after the ecological collapse in *The Death of Grass*, and communities revert to the fundamental unit: the family. Almost immediately, the effects of this disintegration are seen in the loss of compassion, empathy, and charity for anyone outside of the family group. For instance, when John Custance, shepherding his own family to an isolated farm belonging to his brother, is faced with another family on the road, and a more vulnerable one—including children and an elderly grandparent—he denies all responsibility for them in a refusal of community values that would have been unthinkable in the pre-apocalyptic environment.

If some pre-apocalyptic actions, previously distasteful or even taboo, become acceptable after apocalypse, there are other social systems that do not change. Previously existing prejudices, and system-wide inequalities, can become further entrenched within marginal environments. An unstable world with increasingly limited resources can in some cases, encourage the continuous isolation of out-groups, in much the same way as the Norms of *The Chrysalids* maintain their society by exiling those with congenital birth defects and other mutations. *The Dazzle of Day*, with its Quaker-derived emphasis

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on diversity, bucks the trend. The question of whether the disabled are eligible for interstellar migration is quickly decided, in favour of inclusion. Such emphasis on choosing diversity and inclusion as a community survival trait can also be observed in Octavia Butler's *Parable of the Sower*. Faced with a choice of who to aid on the road, Lauren's decisions are driven not by any perceived strength or skill in a person, but simply by whether they are receptive to her kindness and her ideals. She offers advice and assistance to those who need it, and some choose to join her. Her choices are cosmopolitan—an older man, a father and daughter, two ex-prostitutes, an escaped slave and her son. By including people who might be perceived as a burden, such as young children, Lauren argues that anyone is capable of becoming an actor for change.

Narratives such as *Pacifica*, by Kristine Simmons, on the other hand, are inspired by historical exclusions. Simmons' Japanese grandmother was arrested in Hawaii during World War II and sent to an internment camp, and in her introductory author's note, Simmons comments that "The setting of this story—a world post-polar ice cap melt—is also meant to represent the world [her grandmother] faced" (Simmons, 2018, p. 11). The severance of society into hostile and competing parts mimics the exploitative practices that caused ecological collapse in the first place. Ecological actors, then, are social actors as well, and the social ecosystem—with its advantages and disadvantages—often derives directly from the relationship that humans have with ecology. If that relationship chooses to prioritise conflict, exploitation, and greed over the health of the system as a whole, then there is often little incentive for humans to behave differently in relationships within their own species. This tendency is frequently underlined, or even excused, within the narrative by the belief that survival in a devastated ecology hinges on being part of a small and isolated population. If ecological apocalypse devastates ecology to the extent that larger communities become non-viable, then the only communities that survive that altered ecology will be small ones; and the smaller the community,

the less likely they are, in aggregate, to be effective ecological actors. This effectiveness may be either positive or negative, with ecological actors able to further damage ecology by their actions or to contribute to a restoration of that ecology.

This perception of other ecosystem members—and other human beings are also members of that ecosystem—as hostile actors is an attitude that can often be extended to the ecosystem itself. When the natural world is perceived as a hostile place, the role of the ecological *activist* (as opposed to ecosystem *actor*) is changed. Where once, an individual might have attracted generalised sympathy for their efforts to save the natural world they may, in a post-apocalyptic environment, be increasingly at odds with government and corporate powers, or even the ordinary people around them who are more focused on personal rather than ecological survival. There is, of course, some overlap between the two, but an emphasis on the former rather than the latter can tend to prioritise short term, ecologically destabilising behaviour.

This position is illustrated in *The Windup Girl* by Paolo Bacigalupi. Here, Kanya joins the White Shirts, the enforcement arm of the Environmental Ministry, for the express purpose of betraying them after they destroy her village when its fields become infected. But she can't be a part of this protective force without being changed by it and, when it appears that the Seed Bank that is the lifeblood and heritage of her people is going to be plundered, she rises up against the foreigners it has been promised to, destroying them, the city, and the revolutionary government, and becoming, in the process, the leader of the Environmental Ministry and a power for ecological protection herself. In effect, she becomes what she once hated, someone who will countenance violence and destruction in service of a great goal. She has learned that what she values most are her countrymen, and to protect them, she must protect the ecology first, no matter the cost. Ecological action, then, is in *The Windup Girl*, political action. The two cannot be separated. For many activists, fight-

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ing for the natural world is on some level fighting for humanity; fighting to create or save a world where humans—all humans, as Butler and Gloss would argue—can survive. What, then, of the ecological activist who considers humanity a plague to be exterminated?

In *Oryx and Crake* by Margaret Atwood, the character of Oryx sees the fate of ecological activists in the death of his father and his friend Jimmy's mother, both killed for their struggle to reduce the impact of greedy corporations on the already failing ecosystem. Oryx, obsessed with the huge number of extinct species and trained by the very corporations he hates, takes the question of humanity's impact and chooses a different solution—humanity must become extinct. In their place, he creates a new breed of humans, genetically engineered to fit seamlessly into their environment and all of them lacking the features that he believes led to humanity's downfall: greed, pride, sexual competition, and overconsumption. Compare this to Gibbons in *The Windup Girl*, the AgriGen defector who, escaping to Thailand, sells his skills to the Thai government for protection and treatment for his genetic disease. He is a Generipper, "Reengineering long-extinct DNA [...] to survive despite the assaults of blister rust, Nippon genehack weevil and cibiscosis" (Bacigalupi, 2012, p. 64). When Kanya confronts him, he is dismissive of her efforts to defeat plagues and diseases, claiming that it is "easier to build a person impervious to blister rust than to protect an earlier version of the human creature" (Bacigalupi, 2012, p. 243). Gibbons does not see himself as an activist; indeed, he is egotistical and competitive, more concerned with defeating another scientist than with any philanthropic motivations. But Gibbons does not share the common opinion that gene-ripped animals have no souls, and no value. To him, the Cheshires, the New People, are the future of the world. "Evolve or die," he tells Kanya (Bacigalupi, 2012, p. 243).

In all of these narratives, the conflict is clear—humans must be the victors, or the victims. Control

equates to survival. Lack of control means the end of humanity, either by extinction or deliberate removal to make way for other species more in tune with the ecology.

The late 1990s saw a change in the concept of resource management, moving away from "the historical process of converting the world's life-support systems into mere commodities, [through which] resource management science was geared for the efficient utilisation of resources as if they were limitless" (Berkes, Folke & Colding, 2001, p. 1). This concept of the socio-ecological system considers humans, the geophysical environment, and the biological environment to be linked and dependent on each other for sustainability and resilience. To move away from the concept of control (humans acting on the ecosystem) to one of cooperation (humans acting as part of the ecosystem) requires considerable social change. Such significant changes exist in narratives like *The Day of the Triffids*, *Lotus Blue*, *The Road*, and *The Chrysalids*, for instance, as polygamy, tribalism, cannibalism, and religious fundamentalism become accepted parts of various societies. And yet, in all of these examples, human attitudes toward the environment have not significantly changed. The tension between survival and management remains.

But there is another role that humans can play in the environment, one that is measured, considerate, and takes into account both the needs of humanity and the needs of the environment. Butler's *Parable of the Sower* tells the story of Lauren Olamina, a young woman in a USA characterised by ecological and economic collapse. The lucky few live in walled-off neighbourhoods, vulnerable to attack from the homeless and desperate people outside of the walls. Within, the citizens are semi-self-sufficient, growing their own food and struggling to endure until things improve.

"Things were better when I was little," Emery said. "My mother always said they would get better again. Good times would come back. She said

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they always did. My father would shake his head and not say anything.” (Butler, 1993, p. 278)

The nostalgia for past contentment is a strong theme in most post-apocalyptic narratives but doesn't necessarily lead to action. It frequently leads to a curious inertia in the population; a desire to just “hang on” and hope that things will change for the better. Even when the characters are aware of the continued fall, it doesn't drive them to act. In contrast to the people around her, Lauren sees the need for change and embraces it; she builds an entire religion called Earthseed, based on the premise that God is change, and that humans have the power to embrace change and to survive. She argues that “All successful life is Adaptable, Opportunistic, Tenacious, Interconnected and Fecund. Understand this. Use it. Shape God” (Butler, 1993, p. 117).

Butler's narrative is rare in that it says that humans can live within ecology in a relationship that is not detrimental to either. Unlike the characters in the previous narratives, Lauren recognises the need to adapt and to look to the future: “Fixing the world is not what Earthseed is about. The stars, I know [...] This world would be a better place if people lived according to Earthseed” (Butler, 1993, p. 252).

Like the characters in *Dazzle of the Day*, Butler's ecologically minded characters have realised that they can't achieve what they need on Earth due to the ecological and political indifference of the general population. Unlike the characters in *The Road* and *The Death of Grass*, however, this migration is not due to the demands of immediate survival, but is instead driven by the need to abandon an old mindset in order to develop a new one.

Is this the future for humanity? Can humans co-exist with nature in a way that damages neither? Some might argue that removing humans from an ecosystem would allow that ecosystem to recover, but this is an argument at odds with nature itself, which is also subject to chaotic and unpredictable non-human destruction (for example, meteor strikes or earthquakes). If the purist ideal of the ecosystem that Oryx, for example, envisions were to exist, then there would still be mass extinctions. They would in all likelihood be substantially fewer, but, as he would argue, the history of life is also a history of extinction.

Evolution produced humanity as much as it produced any other species. Humans, with their complex brains and excessive consumption, are part of a wider ecology, and their fitness depends on their ability to adapt to a changing environment. Whether this adaptation is physical or social is almost irrelevant, but such adaptation is frequently portrayed in the speculative post-apocalyptic narrative, and it is a portrayal that, as with other environmental issues in these stories, focuses on the human survivors' ability to further impact the apocalyptic landscape. With the depiction of an environment so suddenly and significantly altered, there is a consequential change in the way that humans interact with the natural environment. This change in interaction is primarily affected by the extent and scope of the apocalypse, which influences how humans react, as communities and as individuals, to ecological change. Whether or not they retain the power to be significant ecological actors, and whether or not they acknowledge this role (along with its past consequences and its future responsibilities), humanity's ability to affect the ecology that they are part of is perhaps the most fundamental aspect influencing post-apocalyptic life.

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