



Green Planets

ECOLOGY AND SCIENCE FICTION

Edited by Gerry Canavan and Kim Stanley Robinson

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As its title suggests, this volume was first inspired by Mark Bould and China Miéville's *Red Planets: Marxism and Science Fiction*. But where that book focused primarily on the long-standing connection between science fiction and political leftism, *Green Planets* takes up instead the genre's relationship with ecology, environmentalism, and the emerging interdisciplinary conversation variously called ecocriticism, environmental philosophy, and the ecological humanities.

The oxymoronic combination of “science” and “fiction” in the term “science fiction” suggests in miniature the internal tension that drives analysis of the genre. Is science fiction primarily “science” (knowledge, fact, truth), or is it primarily “fiction” (whimsy, fantasy, lie)? Does the genre offer a predictive window into the world of a future that is soon to come, or does it instead merely reflect the assumptions, anxieties, and cultural preoccupations of its own immediate present? It's little wonder that for decades many writers and critics of science fiction have chosen to eschew the name “science fiction” entirely, preferring “speculative fiction” or (even more commonly) the ambiguous shorthand “SF” as a means of avoiding the problem of the “science” on which the genre is nominally based. In fact almost none of the fantastic, otherworldly tropes most closely associated with SF in the popular imagination are “scientific” in any meaningful sense; the physical laws of reality, as far as anyone can tell, prohibit all the best-loved plot devices, from hyperdrives to mutant superpowers to time travel to perpetual motion machines. Despite frequent pretensions to the contrary from fans and promoters of the genre, the popular designation of a text as SF typically registers not its careful fidelity to current scientific understanding but rather the extremity of its deviation from what science tells us is true.

And yet, despite all the necessary caveats and disavowals, it cannot be denied that we find ourselves living in science fictional times. Waiting in a doctor's office for the results of a genetic test that will tell her the true story of her own future, using a cheap handheld device that can in seconds wirelessly access a vast digital archive of all human knowledge, a person can effortlessly browse all the latest apocalyptic predictions about mankind's radical destabilization of the planet's climate and the concurrent mass extinction of its animal and plant life in between breaking news reports about the latest catastrophic flood, drought, or oil spill. As noted SF author William Gibson once put it: “Today, the sort of thing we used to think in science fiction has colonized the rest of our reality.”¹ It's true that cars still don't fly—but they have started to drive themselves.

Nowhere is the science fictionalization of the present clearer than in contemporary considerations of humanity's interaction with its environment, which frequently deploys the language and logic of SF to narrativize the dire implications of ecological science for the future. Fairfield Osborn's *Our Plundered Planet*, published in 1948, briefly paused in its ecological critique to wonder if perhaps there aren't humanoids somewhere else in the universe treating their planet better than we treat ours; two years later Norbert Wiener, the father of cybernetics, took stock of energy scarcity and entropic breakdown to unhappily declare us “shipwrecked passengers on a doomed planet” in his *The Human Use of Human Beings*.² Paul Crutzen's recent assertion of the Anthropocene—a proposed post-Holocene “epoch” that posits that the multiple impacts of human civilization on the planet will be

visible in the geologic record—takes up the cosmic viewpoint native to SF to imagine the future scientists who will uncover the scant evidence of our existence on a long-deserted post-human Earth; in *Man the Hunter*, from 1969, Richard B. Lee and Irven DeVore deployed the same imaginative frame to consider the “interplanetary archaeologists” of the future from whose perspective “the origin of agriculture and thermonuclear destruction will appear as essentially simultaneous.”³ Rachel Carson, who jump-started the contemporary environmental movement with her stirring denunciation of chemical pesticides, famously chose to begin her book not with some detached presentation of the facts at hand but with a science fictional parable, “A Fable for Tomorrow,” about the inhabitants of a small town “somewhere in America” whose hubris destroys paradise.⁴ The “Spaceship Earth” metaphor for discussing resource scarcity and sustainability has become so naturalized that most of us completely forget its origins in SF. Even now, contemporary debates over the reality of climate change and the urgent need for renewable forms of energy production still frequently break down into accusations that one party or the other is dabbling in “science fiction,” not “science fact”; implicit in this petty sniping is the concession that it is increasingly hard for us to tell the difference between the two. In many ways—and many of them quite disturbing—SF looks less and less like “fiction” at all, and something more like the thin edge of the future as it breaks into the present.

The authors of *Green Planets: Ecology and Science Fiction* share this foundational assumption that science fictional ways of thinking have something useful to teach us about the way the contemporary moment thinks about nature and the world. In this respect it is the latest entry in a long tradition of SF criticism inaugurated by Darko Suvin in his 1972 article “On the Poetics of the Science Fiction Genre,” which announced SF’s importance as the “literature of cognitive estrangement.”⁵ Here Suvin recasts that apparently hopeless contradiction between science/cognition and fiction/estrangement in much more positive terms: the *estrangement* of SF is an incredibly flexible artistic tool for disorienting and defamiliarizing the conditions of everyday life, opening up the mind to previously unimagined possibilities, while *cognition* functions as the reality principle that keeps our imaginations honest. The alienated view-from-outside offered by cognitive estrangement allows us to examine ourselves and our institutions in new (and rarely flattering) light; it distances us from the contemporary world-system only to return us to it, as aliens, so that we can see it with fresh eyes. For Suvin, and for the generation of SF critics that followed, SF was thus at its core always about utopia: the dream of another world that wasn’t just a hopeless fantasy, a glimpse of the better history that could actually be ours, if we would only choose to build it. Even the dystopian nightmares and secular apocalypses that so dominate contemporary SF point us, by negative example, in the direction of utopia: *whatever else you do, don’t do this. ...*

Two decades ago, in the introduction to a collection of ecotopian fictions called *Futurama Primitive*, my coeditor Kim Stanley Robinson offered up a succinct description of the crisis facing the human race in our moment of technological modernity: “We are gaining great powers at the very moment that our destruction of our environment is becoming ruinous. We are in a race to invent and practice a sustainable mode of life before catastrophe strikes us. Our civilization, Robinson goes on, consequently finds itself today in the throes of an incomprehensibly vast project of “rethinking the future,” a Herculean and vertiginous task

that links political environmental movements and radical animal-rights activists to politicians to venture capitalists to organic farmers to freelance inventors to biologists to physicists to chemists to economists to ecofeminists to philosophers to literary critics to writers of SF. Indeed, the recognition of the immense planetary scale of ecological crisis, and the shocking inadequacy of our response thus far, extends the Suvinian interest in cognitive estrangement and utopian dreaming across the entirety of politics and culture today—now the prerequisite for our collective survival. The future has gone bad; we need a new one.

For over a century the thought experiments of SF have been probing our possible future, providing an archive of the imagination where science, story, and political struggle can converge and cross-pollinate. The ambition of *Green Planets* is to trace key moments in this vital and ongoing conversation.

Gerry Canavan

Notes

1. Mavis Linnemann, “William Gibson Overdrive,” [Phawker.com](http://www.phawker.com) (August 15, 2007), <http://www.phawker.com/2007/08/15/coming-attraction-william-gibson-qa/>.
2. Fairfield Osborn, *Our Plundered Planet* (Boston: Little, Brown, 1948), quoted in Eric C. Otto, *Green Speculations: Science Fiction and Transformative Environmentalism* (Columbus: Ohio State University Press), 7–8; Norbert Weiner, *The Human Use of Human Beings* (New York: Da Capo Press, 1950), 40.
3. Richard B. Lee and Irven DeVore, eds., *Man the Hunter* (Chicago: Transaction, 1969), 3.
4. Rachel Carson, *Silent Spring* (1962; New York: Houghton Mifflin, 2002), 2–3.
5. Darko Suvin, “On the Poetics of the Science Fiction Genre,” *College English* 34, no. 3 (1972): 372–82 (372).
6. Kim Stanley Robinson, ed., *Future Primitive: The New Ecotopias* (New York: Tor Books, 1994): 10–11.

Introduction

If This Goes On

GERRY CANAVAN

And it is now that our two paths cross.
Both simultaneously recognise his Anti-type:
 that I am an Arcadian, that he is a Utopian.
He notes, with contempt, my Aquarian belly:
 I note, with alarm, his Scorpion's mouth.
He would like to see me cleaning latrines: I would
 like to see him removed to some other planet.
W. H. Auden, "Vespers" (Part 5 of *Horae Canonicae*)

Borrowing his categories from Auden, Samuel R. Delany has written that two ideological positions are available to us in modernity, each one carrying either a positive or negative charge. One can imagine oneself to be the citizen of a marvelous New Jerusalem, the "technological super city where everything is clean, and all problems have been solved by the beneficent application of science"—or else one can be a partisan of Arcadia, "the wonderful place where everyone eats natural foods and no machine larger than one person can fix in an hour is allowed in. Throughout Arcadia the breezes blow, the rains are gentle, the birds sing, and the brooks gurgle." Each position in turn implies its dark opposite. The flipside of the Good City is the Bad City, the Brave New World, where fascist bureaucrats have crushed the soul of the human, machines have replaced work and love, and smog blocks out the stars; the other side of the Edenic Good Country is the Land of the Flies, where the nostalgic reverie of an imagined rural past is replaced instead by a reversal of progress and an unhappy return to the nightmare of history: floods, wars, famine, disease, superstition, rape, murder, death.¹

These loyalties shape our political and aesthetic judgments. The person whose temperament draws her to the New Jerusalem, Delany goes on to say, will tend to see every city as Arcadia, while the person who longs for Arcadia will see in every city street and every shiny new gadget the nascent seeds of a Brave New World. What seems at first to be a purely spatial matter (*in what sort of place would you rather live?*) turns out in the end to be as much about temporality and political projection (*what sort of world are we making for ourselves?*). Delany's four categories imply speculation about the kind of future world we are building and what life will be like for us when it arrives. In this respect Delany's scheme is of a piece with the dialectic between "thrill and dread," between utopia and apocalypse that Marshall Berman says in *All That Is Solid Melts into Air* defines "modernity" as such: "To be modern is to find ourselves in an environment that promises us adventure, power, joy, growth, transformation of ourselves and the world—and, at the same time, that threatens to destroy everything we have, everything we know, everything we are."² Though Berman pays little attention to the emergence of SF in that work, his description of modernity as the knife-edge between utopia and apocalypse nevertheless usefully doubles as a succinct description

for virtually every SF narrative ever conceived. And little wonder: SF emerges as recognizable cultural genre out of the same conditions of technological modernity that generated literary and artistic modernism at the dawn of the twentieth century, with the ecstatic techno-optimistic anticipation of *Amazing Stories* founder Hugo Gernsback matched always by the unending cavalcade of disaster, catastrophe, and out-and-out apocalypse that Everett and Richard F. Bleiler, in their massive index to the SF of the period, group under the single evocative heading “Things Go Wrong.”³ Indeed, the persistence (and continued popularity) of SF into the contemporary moment can perhaps be thought of as the last, vestigial remnant of the original modernist project: from dazzling architectural cityscapes and off-world colonies to superweapons run amuck and catastrophic climate change, from Marinetti’s worship of progress, technology, and speed to Kafka’s deep and abiding suspicion of the project of modernity as such, SF extends the overawing directive to “make it new” to the farthest reaches of time and space.

Delany argues that the dialectics between city and country and between utopia and apocalypse that generate our New Jerusalems, Arcadias, Brave New Worlds, and Lands of the Flies are crucially operative in basically all SF. Thus the pastoral Arcadia of Wells’s Eloi in *The Time Machine* (1895) is revealed to require the Brave New World of the Morlocks as its true material base, just as Huxley’s *Brave New World* (1932) requires for its own continuation the preservation of an Arcadian “Reservation” as an internal safety valve. In *1984* (1949) the Arcadian refuge has always already been corrupted by totalitarianism, with secret microphones hidden in the flowers and trees. In a host of post-apocalyptic nuclear and zombie fictions from during and after the Cold War, a hopeless and wretched Land of the Flies is imagined as the only possible alternative to the New Jerusalem / Brave New World of American-style consumer capitalism and the national security state; in *Soylent Green* (1973), *Silent Running* (1972), and dozens of other 1970s and post-1970s environmental disaster narratives, we find capitalism hurtling hopelessly toward a final Land of the Flies anyway, as the bitter consequence of its insistence on ceaseless innovation and endless expansion on a finite and limited globe. Ernest Callenbach’s influential *Ecotopia* (1975) articulates in the moment of crisis the possibility of a New Jerusalem that is an Arcadia, precisely through the Pacific Northwest’s imagined secession from a United States that is rapidly collapsing into both a fascist Brave New World and starvation-ridden Land of the Flies. And even in something like the children’s film *WALL-E* (2008) we find tomorrow’s desolate Brave New World of plastic trash and consumer junk can still be recovered as an Arcadia, if only because our robots are smart enough to love nature more than we do.

It is only in postmodernity, Delany goes on to say, that new ideological forms are generated at the interstices of the first four. The first of these is the Junk City—the dysfunctional New Jerusalem in slow-motion breakdown, where the glittering spires have never been cleaned in quite a while, where the gas stations have all run out of gas, and where nothing works quite the way it did when it was new. The positive side of Junk City is a ecstatic vision of improvisational recombinative urban chaos, “the Lo Teks living in the geodesic superstructure above Nighttown in Gibson’s ‘Johnny Mnemonic,’” to borrow Delany’s example, or perhaps something like a fix-it shop in the ruins of today’s Detroit. The other hybrid position is the ruined countryside, toxified by runoff from the cities and factories, which we need not even to turn to SF to imagine; we sadly have enough of the

places in the real world as it is. And the flip side of the ruined countryside, its positive charge, is the unexpectedly sublime vision of decadent beauty that Delany calls the Culture of the Afternoon—the way a sunset, shining splendidly through the smog, glistens off the antifreeze.⁴



Among other things, the shift from the modern to the postmodern as articulated by Delany registers a loss of political-historical agency in favor of a sense of doomed inevitability. The science fictional “Fable for Tomorrow” that opens Rachel Carson’s *Silent Spring* (1962), we might note, tells of an Arcadia “in the heart of America where all life seemed to live in harmony with its surroundings” that is corrupted and destroyed by the introduction of chemical poisons that slowly kill all life in the area. But “No witchcraft, no enemy action had silenced the rebirth of new life in this stricken world. The people had done it themselves”—and thus *we*, reading *Silent Spring* before the final disaster, might yet choose to do otherwise. Similarly, in the nuclear apocalypses that dominated the Cold War imagination of the future, agency is retained always in the spirit of an urgent but still-timely warning; living in the present, rather than the scorched and radioactive future, we can choose not to build the last bomb, and choose not to push the button that will launch it. The haunting UNLESS that punctuates the end of Dr. Seuss’s *The Lorax* (1971) captures well the sense of hope that is retained even in the most dire jeremiads, which presume that politics and indeed revolutions are still possible, that we might still collectively choose to leave the world better than we found it.

For Fredric Jameson, it is also this loss of faith in the possibilities of political and social transformation—the evacuation of futurity that Francis Fukuyama famously called “the end of history”⁶—that marks the shift from modernity to postmodernity. The incapacity for the imagination of alternatives to global capitalism has been frequently encapsulated by Jameson’s well-known, oft-misquoted observation from *The Seeds of Time* that “it seems to be easier for us today to imagine the thoroughgoing deterioration of the earth and of nature than the breakdown of late capitalism.”⁷ Back when we were modern, we believed real change was possible; now that we are postmodern, we are certain it is not.

Shifts in the dominant vision of ecological apocalypse between the modern and postmodern periods reflect this paradigm shift in our relationship to futurity. The superweapons of early twentieth-century SF—and their terrible actualization in the nuclear bomb—threatened to unpredictably explode at any moment in the future, destroying all we have, and transforming the planet into a radioactive cinder. Thus the urgent need in the present, expressed in so much leftist SF of the period, to oppose more bombs, more wars. But as *Green Planets* contributor Timothy Morton has noted, the temporality of climate change, the characteristic planetary apocalypse of our postmodern moment, is rather different. “Global warming is like a very slow nuclear explosion that nobody even notices is happening...That’s the horrifying thing about it: it’s like my childhood nightmares came true, even before I was born.”⁸ In the unhappy geological epoch of the Anthropocene—the name scientists have proposed for the moment human activities begin to be recognizable in the geological record, the moment visiting aliens or the future’s *Cockroach sapiens* will be able to see scrawled in their studies of ice cores and tree rings that *humanity wuz here*⁹—the clima-

has always already been changed. The current, massive disruptions in global climate, that to say, have been caused by the cumulative carbon release of generations of people who were long dead before the problem was even identified, as well as by ongoing release from the immense networks of energy, production, and distribution that were built and developed in the open landscape of free and unrestricted carbon release—networks on which contemporary civilization now undeniably depends, but which nobody yet has any idea how to replicate in the absence of carbon-burning fossil fuels. As Benjamin Kunkel has wittily noted: “The nightmare, in good nightmare fashion, has something absurd and near inescapable about it: either we will begin running out of oil, or we won’t.”¹⁰ That is: either we have Peak Oil, and the entire world suffers a tumultuous, uncontrolled transition to post-cheap-oil economics, or else there is still plenty of oil left for us to permanently destroy the global climate through continued excess carbon emissions.

Despite the urgency of these increasingly undeniable ecological constraints placed upon human activity, however, late capitalism remains a mode of production that insists (culturally) and depends (structurally) on limitless expansion and permanent growth without end: into the former colonial periphery, into the peasant countryside, through oil derricks into the deepest crevices of the earth, and, then, in futurological imaginings, to orbital space stations, lunar cities, Martian settlements, asteroid belt mining colonies, sleeper ships to Alpha Centauri, and on and on. It is a process of growth whose end we can simply not conceive. “The Earth got used up,” begins the intro to several episodes of Joss Whedon’s western-in-space *Firefly* (2002), “so we moved out and terraformed a whole new galaxy of Earths.”¹¹ It sounds so easy! But from a scientific standpoint the other planets in the solar system are simply too inhospitable, and the distances between solar systems far too great, for the fantasy of unlimited expansion to ever actually be achievable.

Moreover, putting aside the sheer impossibility of this persistent trope of capitalist ideology—the basic mathematical impossibility of economic growth that *literally* never ends—we should find that narratives of space colonization dialectically reinscribe the very horizon of material deprivation and ultimate limit that they are meant to relieve. “Escape” from Earth actually only constrains you all the tighter, in miniature Earths smaller and more fragile than even the one you left. In his essay “The Economics of the Coming Spaceship Earth,” discussed in Sabine Höhler’s chapter of *Green Planets*, Kenneth E. Boulding (the cofounder of the Society for the Advancement of General Systems Theory¹²) notes this reality as he characterizes the “critical moment” of the mid-twentieth century as a transition from “cowboy economy” to a “spaceman economy”:

For the sake of picturesqueness, I am tempted to call the open economy the “cowboy economy,” the cowboy being symbolic of the illimitable plains and also associated with reckless, exploitative, romantic, and violent behavior, which is characteristic of open societies. The closed economy of the future might similarly be called the “spaceman” economy, in which the earth has become a single spaceship, without unlimited reservoirs of anything, either for extraction or for pollution, and in which, therefore, man must find his place in a cyclical ecological system which is capable of continuous reproduction of material form even though it cannot escape having inputs of energy.¹³

The echo of Frederick Jackson Turner’s 1893 “frontier thesis” is unmistakable; a once-open, once-free horizon of expansive possibility, which previously drove American history, has now slammed forever shut.

In the cowboy economy, consumption is an unalloyed good; if there are infinite reservoirs of everything (or abundant resources so inexhaustible as to be effectively infinite), the health

of an economy is logically predicated on the expansion of consumption. But on a spaceship economy, governed by scarcity, reserves must always be tightly controlled, requiring reevaluation of the basic principles of economics:

By contrast, in the spaceman economy, throughput is by no means a desideratum, and is indeed to be regarded as something to be minimized rather than maximized. The essential measure of the success of the economy is not production and consumption at all, but the nature, extent, quality, and complexity of the total capital stock, including in this the state of the human bodies and minds included in the system. In the spaceman economy, what we are primarily concerned with is stock maintenance, and any technological change which results in the maintenance of a given total stock with a lessened throughput (that is, less production and consumption) is clearly a gain. This idea that both production and consumption are bad things rather than good things is very strange to economists, who have been obsessed with the income-flow concepts to the exclusion, almost, of capital-stock concepts.¹⁴

This central insight—an ecological one—makes visible certain contradictions that were programmatically obscured by the “space empire” fictions so popular in the Golden Age of SF. In stark contrast to the untold riches and total freedom they are imagined to provide, distant space colonies—whether on inhospitable moons or orbiting far-flung planets—are in fact necessarily markers of deep, abiding, and permanent scarcity, requiring, for any hope of survival, careful planning and rigorous management, without any waste of resources. From an earthbound perspective, the colonization of space appears wildly expansive, a “New Frontier” that opens up the entire universe to human experience and exploitation—but from the perspective inside one of these spaceships or colonies, life is a state of fragile and even hellish enclosure, at constant risk of either deadly shortages or deadly exposure to the void outside.

Asimov, of all SF writers, confronts this paradox in a late work, *Robots and Empire* (1985), which sees one of its robot heroes (operating under the self-generated “Zeroth” Law of Robots¹⁵) deliberately and permanently poison Earth’s crust with radioactive contaminants in order to force humans off their otherwise paradisaical home world. Earth is already perfect for us, the robot R. Giskard reasons—too perfect. The only way to get human beings off the planet and out into the universe (where, scattered across hundreds of worlds, the species will finally be safe from any local planetary disaster) is to destroy Earth altogether: “The removal of Earth as a large crowded world would remove a mystique I have already felt to be dangerous and would help the Settlers. They will streak outward into the Galaxy at a pace that will double and redouble and—without Earth to look back to always, without Earth set up as a God of the past—they will establish a Galactic Empire. It was necessary for us to make that possible.”¹⁶ Taken in the context of the rest of Asimov’s immense shared universes, the intended conclusion for the reader is that this robot indeed made the correct decision to poison the planet and kill all nonhuman life on Earth.¹⁷

The use of interstellar travel and space colonization as a metaphor for understanding and reimagining questions of material/ecological limit is well-trodden ground in SF, in works ranging from Brian Aldiss’s *Non-Stop* (*Starship* in the United States) (1951) to Robert Heinlein’s *The Moon Is a Harsh Mistress* (1961)—which popularized the ecologically sound proverb “There ain’t no such thing as a free lunch”—to my coeditor Kim Stanley Robinson’s own unapologetically utopian *Mars* trilogy (1990s). It is even, in somewhat sublimated form, the kernel structuring Stephen King’s recent horror blockbuster, *Under the Dome* (2009), in which an impenetrable barrier suddenly isolates Chester’s Mill, Maine, from the rest of the outside world, leading to immediate resource scarcity, social breakdown, and violent chaos. As King told popeaters.com:

From the very beginning, I saw it as a chance to write about the serious ecological problems that we face in the world today. ~~The fact is we all live under the dome. We have this little blue world that we've all seen from outer space, and it appears like that's about all there is. It's a natural allegorical situation, without whamming the reader over the head with it....~~ But I love the idea about isolating these people, addressing the questions that we face. We're a blue planet in a corner of the galaxy, and for all the satellites and probes and Hubble pictures, we haven't seen evidence of anyone else. There's nothing like ours. We have to conclude we're on our own, and we have to deal with it. We're under the dome. All of us.¹⁸

As King suggests, and as Ursula Heise has described in more detail, in the 1960s and 1970s these questions of limit crystallize around a particular series of science fictional visual images that, while familiar and perhaps unremarkable today, were revelatory and even shattering in their moment: Soviet and especially NASA images of Earth as viewed from space, chief among them the “Earthrise” photograph obtained by the *Apollo 8* crew in 1968 and the “Blue Marble” photograph taken by the *Apollo 17* crew in 1972. (To Heise’s list we might add the “Pale Blue Dot” photograph taken by *Voyager 1* in 1990, in which a six-billion-kilometer distant Earth is but a single pixel, barely visible against a field of total darkness.) The wide circulation of these “blue planet” images, Heise writes, represents Earth as an immanent and immediately graspable totality, in which all differences between race, class, gender, nation, ideology, and ecosystem have been completely smoothed away: “Set against a black background like a precious jewel in a case of velvet, the planet here appears as a single entity, united, limited, and delicately beautiful.”¹⁹

But the utopian possibilities encoded in this reading of the photo—*we are all one species on this pale blue dot*, we are all in this together—can just as quickly give way to the brutal and apocalyptic. This is, after all, Al Gore’s anxious use of the “Pale Blue Dot” photo in his climate change documentary *An Inconvenient Truth* (2006): “You see that pale, blue dot? That’s us. Everything that has ever happened in all of human history has happened on that pixel. All the triumphs and all the tragedies, all the wars, all the famines, all the major advances....It’s our only home. And that is what is at stake: our ability to live on planet Earth, to have a future as a civilization.”²⁰ In this reading “Spaceship Earth” quickly becomes not our paradise, but our prison—we are all of us trapped here, waiting to be killed either by cosmic accident or our own folly. Indeed, I would suggest that post-1970s recognition of this unhappy ultimate limitation on the future growth of wealth may do much to explain the cultural importance of cyberpunk in the 1980s and 1990s and speculation about technological “Singularity” in the 2000s, as both at their core offer an alternative scheme for getting outside scarcity and precariousness—simply leave the material world altogether, by entering the computer. In virtual space, with no resource consumption or excess pollution to worry about, we can all be as rich as we want for as long as we want (or so the fantasy goes).

The more we learn, the smaller Earth seems—much too small, far too delicate, to encompass all our lavish dreams of inexhaustible, techno-futuristic wealth. And yet, for years since a human being last set foot on the moon, we are increasingly just as certain that there is nowhere else for us to go. Thus ecological discourse, both in and outside SF, both during and after the 1970s, becomes characterized by a claustrophobic sense of impending ecological limit, the creeping terror that technological modernity, and its consumer lifestyle, may in fact have no future at all. Chad Harbach in *n + 1* captures well the material origins of this sense of dread:

America and the fossil-fuel economy grew up together; our triumphant history is the triumphant history of these fuels. We entrusted to them (slowly at first, and with increasing enthusiasm) the work of growing our food, moving our bodies, and

building our homes, tools, and furniture—they freed us for thought and entertainment, and created our ideas of freedom. These ideas of freedom, in turn, have created our existential framework, within which one fear dwarfs all others: the fear of economic slowdown (less growth), backed by deeper fears of stagnation (no growth) and, unthinkable, contraction (anti-growth). America does have a deeply ingrained, morally coercive politics based in a fear that must never be realized and this is it. To fail to grow—to fail to grow ever faster—has become synonymous with utter collapse, both of our economy and our ideals.²¹

In a recent essay in *Harper's*, Wendell Berry makes much the same point, describing U.S. energy policy as a “Faustian economics” predicated on a “fantasy of limitlessness” that, when put under threat, produces claustrophobia and dread.²² Dipesh Chakrabarty, drawing from Timothy Mitchell, has in turn suggested that we might extend this analysis even further across the whole of post-Enlightenment liberal democracy: “The mansion of modern freedom stands on an ever-expanding base of fossil-fuel use.”²³ In this sense limit and apocalypse can be thought, in the ideology of American-style capitalism at least, to be nearly synonymous—indeed, the end of the liberal subject as such.

Few cultural documents depict this moment of anxious confrontation with limit more vividly than the opening sequence of the overpopulation disaster film *Soylent Green* (1973) which depicts a miniature history of America. We begin with a quiet classical piano score over a sepia-tinted montage depicting nineteenth-century settlement of the American West, in which the wide-open natural spaces of the frontier seem to dwarf their human inhabitants. But soon something begins to change. Suddenly there are too many people in the frame, there are far too many people; cars and then airplanes begin to appear; cities grow huge. New instruments enter the musical track: trumpets, trombones, saxophones; the cacophony begins to speed. Now humans are dwarfed not by nature but by the ceaseless replication of their own consumer goods—replicating the logic of the assembly line, the screen becomes filled with countless identical cars. We see jammed highways, overflowing landfills, smog-emitting power plants, flashes of war, riots, pollution, and graves. The sequence goes on and on, using vertical pans to give the sense of terrible accumulation, of a pile climbing higher and higher and higher. Finally, we reach the end—the music slows back to its original piano score combined with an out-of-harmony synthesizer, over a few sepia-tinted images of that same natural world in ruin, now filled with trash. The end of the sequence locates this site of ruin in the future; New York, 2022, population forty million. But of course these nightmarish images are all photographs from the present: the disaster has already happened, it's already too late.²⁴

Thus we frequently find, in the Junk Cities and Cultures of the Afternoon that characterize the most contemporary sense of our collective ecological future, a sense that there is nothing left to do but somehow accommodate ourselves as best we can to ongoing and effective permanent catastrophe. In *Nausicaä of the Valley of the Wind* (1984), a widely loved ecological anime from Japanese filmmaker Hayao Miyazaki, the eras of both green forests and global capitalism are in the distant past, lost in the mists of thousands of years. The legacy of our time—the legacy of a final war called the Seven Days of Fire—is a snarl of toxic jungles and mutant insects, in the gaps of which scattered human beings still struggle to survive. Paolo Bacigalupi's stories of the future (discussed by Eric C. Otto in his chapter in this volume) frequently see their quasi-human and nonhuman protagonists exploring polluted, toxic landscapes in search of new types of beauty (if any are possible) in a world where unchecked capitalism has completely destroyed nature. And in John Brunner's utterly apocalyptic *The*

Sheep Look Up (1972)—the best of 1970s ecological SF, if only because it so unflinchingly shows us the worst—even this consolation is denied us as a parade of manmade environmental horrors poisons every aspect of our lives, where Things Go Wrong, and Wronger, and Wronger Still, but nothing ever changes.

The logical endpoint of such narratives generates a final position of the imagination located beyond even Delany's proposed Junk Cities and Cultures of the Afternoon: the Quiet Earth, a planet that is devoid of human life entirely. The negative charge of the Quiet Earth is the elegiac fantasy of an entirely dead planet—a murdered planet—in which the human species has left behind nothing but ruin before finally killing even itself. Margaret Atwood evokes this vision of a Quiet Earth in a short flash fiction (written for the *Guardian* during the 2009 Copenhagen climate summit) called "Time Capsule Found on the Dead Planet," which finds a human race whose apex of development was the twentieth-century creations of deserts and death. (In the face of this final extinction even her apocalyptic novel *Oryx and Crake*, written six years earlier, seems somehow upbeat.) In a spirit of mourning and loss, the speaker of the piece addresses him- or herself to the unknown aliens who have come millennia hence, to bear witness to our vanishing: "You who have come here from some distant world, to this dry lakeshore and this cairn, and to this cylinder of brass, in which on the last day of all our recorded days I place our final words: Pray for us, who once, thought we could fly."²⁵

Atwood's blighted vision of a ruined world recalls—and transforms—Percy Bysshe Shelley's 1818 poem "Ozymandias" as an anticipatory memory of Earth's barren future. In the desert of a "distant land" stands the toppled monument to the arrogant king of a long civilization that believed both he and it to be immortal. But only the head and legs remain; all else has turned to dust. "Lone and level sands" stretch "round the decay of that colossal wreck"; the thriving cities and once-verdant landscapes of Ozymandias's empire have been utterly erased by a totalizing desertification that, in the present moment, inevitably suggests the bleak endpoint of global climate change. Look upon our works, ye Mighty, and despair! Nothing beside remains.²⁶ "When we contemplate ruins," Christopher Woodward writes, "we contemplate our own future";²⁷ the apocalypse is thereby transformed into a memory, an event that is yet to come but which has also somehow, paradoxically, already happened.

The positive side of the Quiet Earth retains at least some small sense of hope, though for other life forms, not for us. As Imre Szeman and Brent Bellamy show in their *Green Planet* chapter on recent depictions of nonhuman Earths in such productions as *Life after People* (2008) and *The World Without Us* (2007), such texts frequently suggest that the elimination of human beings can *itself* be thought of as a kind of misanthropic ecotopia; without us, at least the dogs and the trees and the birds and the bees can go on living. In the Kenyan short SF film *Pumzi* (2010), directed by Wanuri Kahiu, the allegorical stakes are these explicitly; after a devastating series of water wars and droughts, the human race has been driven underground, clinging to every drop of water that can be wrung from sweaty T-shirts or recovered from the condensation on bathroom mirrors. The world outside the bunker is totally dead. But our scientist hero, Asha (meaning "hope" in Sanskrit, "life" in Swahili), discovers a plant seed that she believes can still germinate; stealing into the forbidden world outside, Asha sacrifices first her meager water ration and ultimately her own life to nourish the world's last, and first, tree. A shift to the sublime, God's-eye perspective of time-lapse photography shows the slow

return of life to the desert after years, decades, centuries—Asha’s corpse nourishing its roots. If it’s us or them, the film suggests, perhaps we should choose them.²⁸



But perhaps we can pull ourselves back from this brink. “We have to accept,” Slavoj Žižek has recently written, “that, at the level of possibilities, our future is doomed, that the catastrophe will take place, that it is our destiny—and then, against the background of this acceptance, mobilize ourselves to perform the act that will change destiny itself and thereby insert a new possibility into the past.”²⁹ The bizarre time-travel logic of this notion suggests that the visions of ecological apocalypse might have some radical political potential after all. Capitalism has always been, in K. William Kapp’s memorable formulation, “an economy of unpaid costs,”³⁰ then the growing recognition that the bill is coming due can represent a kind of nascent revolutionary consciousness. Looking through the lens of the apocalypse—skipping ahead, that is, to the end of the story—we can see capitalism more clearly, without the distortions of ideology, complacency, and reaction that ordinarily cloud our view. And there we might, even now, act. As Octavia E. Butler once wrote of her novel of neoliberal deprivation and devastating ecological collapse, *Parable of the Sower* (1993), “Sometime ago I read some place that Robert A. Heinlein had these three categories of science-fiction stories: The what-if category; the if-only category; and the if-this-goes-on category. And I liked the idea. So this is definitely an if-this-goes-on story. And if it’s true, if it’s anywhere near true, we’re all in trouble.”³¹ Perhaps the true fantasy of apocalypse then is not so much that we will be destroyed but that *something might intervene in time to force us to change*—apocalypse in its original, biblical sense, from the Greek ἀποκάλυψις, connoting not a final end but an unveiling: *revelation*. The fantasy of apocalypse is here unveiled as itself a mode of critique, crying out for change.

At the core of James Cameron’s *Avatar* (2009)—whatever else we might have to say about the film’s lavish visual spectacle and its troubling politics of race, gender, disability, and indigeneity—is the fantasy that a typical American might somehow be *transformed*: put into another body, located in another social-historical context, capable of living a different sort of life. The desire for this transformation is so strong that it leads even the film’s domestic audiences to root against what is essentially the U.S. military as it invades the planet Pandora, looking to seize control of its valuable resources for the benefit of a desperate, dying Earth—with our hero leading the resistance and successfully forcing the imperialists off the planet. And his reward for all this in the end is to be permanently transferred into the body of the big-O Other—to, in essence, not have to be an eco-imperialist any longer.³² Little wonder, perhaps, that despite the anxiety over the film’s clear evocation of Orientalist and white savior fantasies like Pocahontas and *Dances with Wolves* that has dominated its reception in the Western academy, *Avatar* has frequently been embraced by indigenous activists in the Global South, who see in it a science fictional reflection of their own struggles.

A similar miracle takes place at the end of little-seen box-office flop *Daybreakers* (also from 2009), which makes literal the metaphor famously employed by Karl Marx: “Capital is dead labour, that, vampire-like, only lives by sucking living labour, and lives the more, the more labour it sucks.”³³ Ten years after a viral outbreak that has turned the national elite into vampires, in *Daybreakers*’ 2019 there are no longer enough humans left to feed America

insatiable desire for blood. Vampires who go without blood for too long are transformed into monstrous “subsiders” that attack anything that moves; as the film opens, the subsider epidemic is just reaching the suburbs. Coffee shops advertise that they “still sell 20% blood” while “blood riots” rock the Third World. All efforts at an energy substitute are stalled. America has reached Peak Blood.

The solution here is again personal transformation: it turns out that through controlled exposure to the sun, vampires can be cured. But the “cured” vampires cannot be revampirized; in fact their blood itself now contains the cure, turning any vampire who drinks from them into a cured human as well. What is being imagined is a kind of viral enlightenment operating through an epidemiological social network—friend to friend, relative to relative, coworker to coworker—that has the power to slowly transform a society of vampire-consumers back into human beings once again.³⁴

The active fantasy in both these narratives, and in dozens of others across the field of ecological SF, is salvific: that the nightmare of exploitation, and our own complicity in these practices, might somehow be stopped, despite our inability to change. As Kierkegaard put it in an epigram sometimes invoked by Darko Suvin: “We literally do not want to be what we are.”³⁵ (Since U.S. consumerism is so often framed as an addiction, the ecological state of grace imagined by these films may well be thought of as something like AA’s “Higher Power.”) The task before us then would seem to be to transform that dream wish into waking act, to find ways to nourish and sustain the drive to change even in a world of ordinary, nonmiraculous causation, transforming Reagan and Thatcher’s slogan that “there is no alternative to capitalism” to Suvin and Jameson’s that “there is no alternative—to utopia.” “Someone once said that it is easier to imagine the end of the world than to imagine the end of capitalism,” Jameson writes:

We can now revise that and witness the attempt to imagine capitalism by way of imagining the end of the world.

But I think it would be better to characterize all this in terms of History, a History that we cannot imagine except as an ending, and whose future seems to be nothing but a monotonous repetition of what is already here. The problem is then how to locate radical difference; how to jumpstart the sense of history so that it begins again to transmit feeble signals of time, of otherness, of change, of Utopia. The problem to be solved is that of breaking out of the windless present of the postmodern back into real historical time, and a history made by human beings.³⁷

How then to imagine a history in which modernity’s ongoing destruction of nature does not itself carry the weight of an immutable law of nature? Where might we even begin?

One interesting, if complicated, attempt to do depict an alternative mode of history comes somewhat unexpectedly during the credit sequence of a recent children’s film, Disney’s *WALL-E*. Here we see precisely the difficulty of imagining an equitable and sustainable future history made by human beings—what my coeditor, borrowing from Australian agriculturalist Bill Mollison and David Holmgren, has elsewhere called a “permaculture”³⁸—in the intriguing credit montage that follows the film’s abrupt happy ending. As in Atwood’s “Time Capsule” the logic of interstellar expansion and space empire has been reversed: here, the janitorial robot *WALL-E* has brought the morbidly obese Americans of the future *back* to the Earth that they once ruined, and robot and human together begin the process of rehabilitating the global ecology the humans completely destroyed. The extremely earnest Peter Gabriel song playing over the sequence, “Down to Earth,” points our attention to this reversal of the usual direction of progress: “Did you feel you were tricked / By the future you picked?” Instead of a future “high in the sky” where “all those rules don’t apply,” the lyrics offer us snow, river

birds, trees, and “land that will be looked after.”

Recalling the looping cyclical repetitions of history of Marx’s *18th Brumaire of Louis Bonaparte*, this attempt to imagine and represent a non-apocalyptic, non-disastrous future not (and perhaps cannot be) depicted narratively. Instead, it is represented through montage showing some aspect of the new historical situation through some artistic medium of the past—the sort of artistic media Pixar might consider its own computer-generated practice to have superseded, from cave paintings to Monet’s watercolors—blessedly cutting off with the landscape art of Vincent van Gogh in, one supposes, an attempt to avoid having unhappily endure all the many disasters of the twentieth century a second time. (Precisely this fantasy is, after all, at the core of the recent steampunk movement in SF, which similarly offers us the thrills of advanced technology without the constraints, limits, and existential horrors that historically came alongside it.)

The paradox inherent in *WALL-E*’s visualization of ecotopia is clear: it sidesteps the question of how the generally hopeless ecological situation the film depicts (a hyperbolic, super-exaggerated version of the very quagmire we find ourselves in) could ever actually get any better, finding recourse instead in a nostalgia that imagines this better future as a replication of the very path that led us into the disaster in the first place. But at the same time the bizarre cognitive estrangement of the montage—the historical juxtapositions, the anachronistic presence of robots at every stage, the culmination of history in a new permaculture that is shown to take its roots from van Gogh’s famous workboat—prevents this from being the merely nostalgic or bad utopian fantasy of a “return to nature” that it might initially appear to be. In foregrounding the impossibility of imagining historical difference while insisting at the same time on the vital necessity of doing so, *WALL-E* pushes us unexpectedly in the direction of utopia, forcing us to think about what the radical singularity of that historical break might entail. It deploys the meager imaginative tools we have at hand to refashion the fixed reality of Joyce’s “nightmare of history”³⁹ as it actually happened into the fresh possibility of a new history, still open and unfixed, and somehow done right this time. History, for a few scant minutes at least, becomes unmoored; things, after all, might just be otherwise.⁴⁰

The utopian potentiality implied—and, often, made possible—by apocalyptic critique is the necessary critical move to rescue us from a diagnosis of the world situation that would otherwise appear utterly hopeless. In his contribution to Mark Bould and China Miéville’s *Revolutions: Planets: Marxism and Science Fiction*, the collection that inspired this volume, Carl Freedman identifies as a central disjuncture in Marxist thought the distinction between deflationary and inflationary modes of critique. But, as Freedman shows, deflation and inflation necessarily function as a dialectic. The cold calculus of deflation—“the attempt to destroy all illusions necessary or useful to the preservation of class society in general and of capitalism in particular”—is predicated on the baseline moral recognition that the injustice, deprivation, and suffering that is being described *ought not exist*; and the soaring utopian heights of inflation can only surpass mere wishful thinking when they arise out of a historical-scientific understanding of capitalist reality as it now exists.⁴¹ Ecocritique, like the cognitive estrangements of SF, and like the leftist project as a whole, necessarily operates along the same dialectic of deflation and inflation. And, like these other modes, ecocritique requires both deflation and inflation to stay vital. This is why the impulse toward the miserable

deflationary naming of all the various ongoing ecological catastrophes is always matched (only in negative) by an inflationary, futurological impulse toward the better world that might yet be. Here utopia and apocalypse unexpectedly collapse into one another—they are each disguised versions of a single imaginative leap into futurity.

The essays in *Green Planets* are predicated on the proposition that two hundred years of SF can help us collectively “think” this leap into futurity in the context of the epochal mass extinction event called the Anthropocene (which the literary theorists more simply call “modernity”). SF is our culture’s vast, shared, polyvocal archive of the possible; from techno-utopias to apocalypses to ecotopian *fortunate falls*, it is the transmedia genre of SF that has first attempted to articulate the sorts of systemic global changes that are imminent, or already happening, and begins to imagine what our transformed planet might eventually be like for those who will come to live on it. Especially taken in the context of escalating ecological catastrophe, in which each new season seems to bring with it some new and heretofore-unseen spectacular disaster, my coeditor’s well-known declaration that in the contemporary moment “the world has become a science fiction novel” has never seemed more true or more frightening.⁴² Indeed, such a notion suggests both politics and “realism” are now *always* “inside” science fiction, insofar as the world, as we experience its vertiginous technological and ecological flux, now more closely resembles SF than it does any historical realism. In this sense perhaps even ecological critique as such can productively be thought of as a kind of science fiction, as it uses the same tools of cognition and extrapolation to project the conditions of a possible future—whether good or bad, ecotopian or apocalyptic—in hopes of transforming politics in the present.

In that spirit, the thirteen chapters in this book explore thirteen such transformational moments divided into three sections. In **Part I**, “Arcadias and New Jerusalems,” four critics explore and deconstruct utopian visions of ecological futures. In “Extinction, Extermination, and the Ecological Optimism of H. G. Wells,” Christina Alt foregrounds the unexpected use of extermination imagery and mass extinction in Wells’s *Men Like Gods* as a marker of utopian potentiality—tokening a human race now fully in control of its powers and of the planet. In “Evolution and Apocalypse in the Golden Age,” Michael Page traces a fraught dialogue between optimism and pessimism across such classic SF works as Laurence Manning’s *The Man Who Awoke* (1933), Clifford Simak’s *City* series (1940s), Ward Moore’s *Greener Than You Think* (1947), and George R. Stewart’s *Earth Abides* (1949). In his contribution, Gib Prettyman critiques the historic inability of Marxist critics to fully appreciate Ursula K. Le Guin’s utopian philosophical interest in Daoism, and considers the opportunities made possible by this way of thinking for an ecological leftism that goes beyond economic socialism. Finally, Robert Latham takes up both Le Guin’s *The Word for World Is Forest* (novella 1972, novel 1976) and Thomas Disch’s *The Genocides* (1965) to unpack the critique of exterminative and genocidal fantasy as presented in key texts of the New Wave movement in 1960s and 1970s SF.

Part II, “Brave New Worlds and Lands of the Flies,” turns to much more catastrophic imaginings of both the future of the environment and the people who live in it. In “The Real Problem of a Spaceship Is Its People’: Spaceship Earth as Ecological Science Fiction,” Sabine Höhler reads the ubiquitous “Spaceship Earth” metaphor of contemporary ecological discourse as itself SF, and unpacks the political consequences of this figuration, tracking the way its use trends toward neoliberal calls for austerity, “lifeboat ethics,” and the “ca-

against helping the poor.” Andrew Milner’s “The Sea and Eternal Summer: An Australian Apocalypse” and Adeline Johns-Putra’s “Care, Gender, and the Climate-Changed Future” and Maggie Gee’s *The Ice People* take up two very different approaches to the present paradigmatic vision of generational ecological disaster, climate change, both of which deplete the retrospective viewpoint of the people of the future to speak to people in the present. Milner’s chapter also considers the unique role Australia plays in the global imaginary, both in and outside SF, while Johns-Putra’s consideration of Gee’s novel draws connections to the larger field of feminist and ecofeminist writing (Atwood, Lessing, Winterson) with which the novel is in conversation. Elzette Steenkamp’s reading of recent South African SF in “Future Ecologies, Current Crisis,” which traces figurations of gender, race, and indigeneity through Jane Rosenthal’s novel *Souvenir* (2004) and Neill Blomkamp’s film *District 9* (2009), looks at apocalyptic futurity as a *novum* that reveals for us the absolute interdependence of self and other, and environment in the present, as well as suggests new possibilities for what it means to be “human” at all. Finally, drawing from such works as Douglas Coupland’s *Girlfriend in a Coma* (1998), Margaret Atwood’s *Oryx and Crake* (2003), and China Miéville’s *Kraken* (2010), Christopher Palmer closes the section with a sustained consideration of how the tragic valence of the apocalyptic imaginary gives way to a more comic sensibility in an era when the many catastrophes and disasters have become so well-rehearsed as to have all already happened.

The final section of the text, “Quiet Earths, Junk Cities, and the Cultures of the Afternoon,” considers both recent figurations of postmodern (and post-human) hybrid landscapes, as well as the new ways of thinking that such visions suggest. Eric Otto’s “The Rain Feels New” explores the Cultures of the Afternoon presented in the short fictions of Paolo Bacigalupi, arguing that despite the despair that seems to permeate these works, they nonetheless maintain a utopian political charge. In “Life after People: Science Fiction and Ecological Futures,” Brent Bellamy and Imre Szeman take up a new subgenre of apocalyptic fantasy they call “science faction”: Quiet Earth visions of a world totally emptied of people in which our cities are left to rust, degrade, and rot. Bellamy and Szeman argue that texts like *Life after People* and its ilk, despite their popularity and their nominal focus on important environmental questions, in fact do little to provoke a genuine or effective ecological politics. In “Pandora’s Box: *Avatar*, Ecology, Thought”—putting to one side the political questions about capitalism and globalization raised by the plot of the film in favor of interrogating its ontological grounding—Timothy Morton reads *Avatar* against the grain as a philosophical treatise about worlding and worldlessness, and the strange strangers of Earth’s biosphere who surround us both in similarity and in radical difference. The Na’vi become refigured here not as a vision of some imagined primitivist past, but as a figure for what a genuine postmodern *future* might entail. Finally, using Stanislaw Lem and Greg Egan as her companion theorists, Melody Jue suggests in “Churning Up the Depths: Nonhuman Ecologies of Metaphor in *Solaris* and ‘Oceanic’” that we might be able to draw new modes of cognition, and new frames for theory, by thinking about the inversion and interplay of surfaces and depths of work in ocean environments.

An interview with my coeditor—“Still, I’m Reluctant to Call This Pessimism”—serves as an afterword for the volume, exploring not only the central place of the environment in Robison’s fiction but also the varied uses of science, religion, crisis, capitalism, human and

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