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Retrofutures and Petrofutures

Oil, Scarcity, Limit

Gerry Canavan

Fredric Jameson has written that “in our time . . . the world system . . . is a being of such enormous complexity that it can only be mapped indirectly, by way of a simpler object that stands as its allegorical interpretant.”¹ In this chapter, I offer up oil, and oil capitalism, as one such interpretant for the historical world-system as a whole—and further offer up science fiction as a means to register the different meanings of “oil” that are available in different historical moments.

Oil’s ubiquity and centrality within contemporary consumer capitalism suggests it as an especially useful allegorical interpretant. Oil is extremely local—as local as your corner gas station, as your car’s gas tank—but at the same time it is the token of a vast spatiotemporal network of seemingly autonomous actors. In his story “The Petrol Pump,” Italo Calvino evokes this immense, even sublime, interactivity: “As I fill my tank at the self-service station a bubble of gas swells up in a black lake buried beneath the Persian Gulf, an emir silently raises hands hidden in wide white sleeves, and folds them on his chest, in a skyscraper an Exxon computer is crunching numbers, far out to sea a cargo fleet gets the order to change course.”² To Calvino’s totalizing vision of oil’s global interconnectedness we might add not only the million-year geological time scale necessary for oil’s creation, but also the immeasurably complex flows of money, power, and technology that make the current global economy, and U.S. hegemony within that order, possible. Indeed, both Timothy Mitchell and Dipesh Chakrabarty have recently noted that what we understand as “liberal democracy” is in many ways fundamentally indistinguishable from oil-based prosperity: “The mansion of modern freedoms,” Chakrabarty puts it, “stands on an ever-expanding base of fossil-fuel use.”³ Oil has, in short, made twentieth-century technological modernity possible, in all senses, and the long-term continuation of that modernity appears utterly unthinkable in its absence. And yet, like it or not, we can now see quite clearly

the end of this period of oil-fueled expansion. Oil got us here, but oil can't get us out. Capitalism's continuous need for ever-larger reserves of cheap energy—and the anticipation of the imminent end of our ability to fulfill that need through oil—is therefore a useful way to map the current situation and ultimate fate of contemporary technoculture more generally.

In *The Ecological Thought*, Timothy Morton suggests the name *hyperobject* for multitudinous entities like oil, plutonium, and the climate that exist on “almost unthinkable” spatial and temporal scales, and which seem in this way to exceed any kind of stable, bounded definition.⁴ Steven Shaviro, in turn, has noted that science fiction's status as a consciousness-expanding “psycho-socio-technological cartography” makes it the perfect “focusing device” to attempt cognitive mappings of such hyperobjects.⁵ This cognitive usefulness can be seen quite clearly, I think, in science-fictional treatments of oil and oil capitalism. Oil-as-hyperobject delimits our ability to both understand our historical past and imagine our possible futures, becoming the secret subtext of any number of futurological imaginings—and, as the world-historical scarcity of oil has grown more and more obvious, the glittering techno-utopias of Golden Age science fiction become increasingly replaced by their psychic opposites: apocalyptic, post-peak oil horrors of deprivation and ruin.

Writing in *n+1*, Chad Harbach identifies the historical and ideological forces underpinning these kinds of science-fictional fantasies:

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, unthinkably, contraction (antigrowth). 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.⁶

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 intense claustrophobia and dread.⁷

Alongside all this we must of course note the *other* horn of our intractable futurological dilemma: the unintended and almost exclusively negative consequences of our oil-based economic system for the environment, particularly with respect to carbon release and climate

change. Here our collective inability to think of a future beyond oil capitalism becomes all the more potentially catastrophic. I confess I have become perversely fond of the way Benjamin Kunkel frames the Janus-faced, intertwined crises of climate and energy we now face: “The nightmare, in good nightmare fashion, has something absurd and nearly inescapable about it: either we will begin running out of oil, or we won’t.”⁸ That is to say: either we have peak oil and the entire world suffers a tumultuous transition to post-cheap-oil economics, or else there’s plenty of oil left for us to permanently destroy the global climate through excess carbon emissions.

This chapter focuses on two orthogonal representations of oil in twentieth-century science-fiction narratives. In the first move, I discuss how the necessity of oil is put under erasure in much early and mid-twentieth-century science fiction (whereby oil is retrospectively imagined as a quickly discarded transitional technology). In these texts, I argue, we can see oil’s inescapable centrality to twentieth-century liberal capitalism proven precisely through the fantasy of its painless transcendence. In the second move, I trace the subsequent breakdown of this fantasy, considering various recent manifestations of peak oil from the ecological science fiction of the 1970s through recent allegorical films like *Avatar*, *Moon*, and the little-seen *Daybreakers*. I argue that the one-time symbolic repression of oil has now been replaced in more recent science fiction with a doomed sense of its overriding, totalizing importance—which in turns generates for us a crushing sense of impending futurological limit, of resources and even time itself running out. Science fiction’s happy promise of a post-oil, post-scarcity future, this is to say, has since the oil shocks of the 1970s been largely replaced instead with the creeping terror that technological modernity, and its consumer lifestyle, may in fact have no future at all.

Oil Ontology and the March of Progress

My approach here follows the lead of (among others) Imre Szeman, whose 2007 article “System Failure: Oil, Futurity, and the Anticipation of Disaster” in *South Atlantic Quarterly* suggests the possibility of a new understanding of the history of capitalism organized around what he calls *oil ontology*. “What,” Szeman provocatively asks, “if we were to think about the history of capital not exclusively in geopolitical terms, but in terms of the forms of energy available to it at any given historical moment?”⁹ Such a historiography of capital transitions us from steam capitalism (c. 1765) to oil capitalism (c. 1859), in which the massive reserves of solar energy stored in fossil

fuels begin to be converted into mechanical power at staggeringly efficient rates of EROEI (energy returned on energy invested, a metric of the efficiency of a given energy source). For oil the numbers are truly staggering: they are initially 100:1, as late as the 1930s, meaning that for every calorie of energy expended in retrieving and extracting oil, a hundred calories were generated.

In the era of oil ontology, oil becomes synonymous with progress, even with the future itself. The discovery of oil in one's region means the quick infusion of cash and jobs; the discovery of oil on one's own property translates immediately and inevitably to indescribable riches. Oil, writes Ryszard Kapuściński, "creates the illusion of a completely transformed life, life without work, life for free, it expresses the eternal human dream of wealth achieved through a lucky accident . . . in this sense it is a fairy tale, and like all fairy tales a bit of a lie."¹⁰ Oil is so valuable, of course, because it is a tremendous physical marvel; the cheap, essentially free energy stored in petroleum allows for a tremendous amplification of human powers. The invention of the internal combustion engine and its application in the "gas-guzzling" automobile creates the conditions for technological modernity and its fantastic potential to transform all aspects of life in the United States—a mode of production and consumption John Bellamy Foster has memorably named "the automobile-industrial complex,"¹¹ including not just the systems of production and delivery that make contemporary consumer capitalism possible but also the plastics commonly making up the very consumer goods themselves. Oil is the primary fuel for all the transformative technological wonders of the twentieth century; it is oil, of course, that powers the "racing car" that F. T. Marinetti famously described in his "Futurist Manifesto" as "more beautiful than the Winged Victory of Samothrace."¹² In her "Petroleum Song," Futurist poet Maria Goretti likewise celebrates oil as "the ardent blood of [our] conquests," describing petroleum drilling as a violent seduction of the Earth bordering on a rape: "the drill bores / sinks inseminates / bites crushes tears / the violated earth screams / but now now / the living blood / gushes / rises / rushes / toward the sky / elongated spurt / and sings." The explosion of the well is a sexual climax that is only the first of the future's joys: "all my body relaxes / quivers with pleasure / rejoices with splendor / but tomorrow tomorrow even more mine! . . . Tomorrow you will hear my new song / and it will be the song of azure airplanes!"¹³

In the ideology of ecstatic technological progress that oil ontology generates, it is only natural to assume that in due time oil itself will eventually be superseded by a new form of

energy—something even more excessive and miraculous, allowing for even greater marvels and wonders. This assumption has the paradoxical result of relegating fossil fuels—so central to the workings of modern capitalism, so utterly transformative of every aspect of life in the twentieth century, and so generative of the fantastic new technologies science fiction lauds—to a short historical footnote in the *longue durée* of human progress: oil as mere transitional energy source. The “instructions” laid down for human civilization by Buckminster Fuller in his *Operating Manual for Spaceship Earth* (1969)—which borrows the common trope of interstellar travel from popular science fiction for its organizational logic—exemplifies this way of thinking. Energy that has been “deposited as a fossil-fuel savings account” serves the function of priming even greater energy production for human civilization:

The fossil fuel deposits of our Spaceship Earth correspond to our automobile’s storage battery which must be conserved to turn over our main engine’s self-starter. Thereafter, our “main engine,” the life regenerating processes, must operate exclusively on our vast daily energy income from the powers of wind, tide, water, and the direct Sun radiation energy. The fossil-fuel savings account has been put aboard Spaceship Earth for the exclusive function of getting the new machinery built with which to support life and humanity at ever more effective standards of vital physical energy and reinspiring metaphysical sustenance to be sustained exclusively on our Sun radiation’s and Moon pull gravity’s tidal, wind, and rainfall generated pulsating and therefore harnessable energies. The daily income energies are excessively adequate for the operation of our main industrial engines and their automated productions. The energy expended in one minute of a tropical hurricane equals the combined energy of all the U.S.A. and U.S.S.R. nuclear weapons. Only by understanding this scheme may we continue for all time ahead to enjoy and explore universe as we progressively harness evermore of the celestially generated tidal and storm generated wind, water, and electrical power concentrations. We cannot afford to expend our fossil fuels faster than we are “recharging our battery,” which means precisely the rate at which the fossil fuels are being continually deposited within Earth’s spherical crust.

All this is of course assumed to be perfectly achievable—“provided that we are not so foolish as to continue to exhaust in a split second of astronomical history the orderly energy savings of billions of years’ energy conservation.” “We cannot afford to expend our fossil fuels faster than we are ‘recharging our battery,’ which means precisely the rate at which the fossil fuels are being continually deposited within Earth’s spherical crust.”¹⁴ Oil is a stopgap, a one-time hack. By definition it can be (one way or the other) only the briefest era in species history.

Here a teleological vision of history emerges that we should recognize as in many ways still the key futurological hope of our time: that “our” rapid usage of the world’s entire reserve of fossil-fuel energy *today* is justified because we need it to develop the self-sustaining tidal/wind/solar/fission/fusion technology that will eventually replace it *tomorrow*—replacement

technology that, we have been perpetually assured for decades, is “just a few years away.” In his work, John Bellamy Foster is careful to note the class and geographical differences within that impulse toward a flattened, smoothed-out “our”: “In 2008, Americans in the highest income quintile spent three to four times as much on both housing and clothing, and five times as much on transportation, as those in the poorest quintile. In Canada where consumption data is available in deciles, ecological footprint analysts have found that the top income decile has a transportation footprint nine times that of the bottom decile, and a consumer goods footprint four times that of the bottom decile.”¹⁵ Likewise, Naomi Klein’s work on climate justice and activism has pointed out the “cruel geographical irony” that the countries most vulnerable to climate change having emitted the least amount of carbon into the atmosphere. She suggests 20 percent of the population of the planet has emitted 75 percent of total historical greenhouse gas emission, with the United States (5 percent global population) having emitted approximately 25 percent just on its own.¹⁶ From this perspective, Fuller’s technological optimism looks perhaps less like objective analysis and more like a rationalization for an incomprehensibly large theft on a geologic scale.

In the index for his exhaustive catalogue of the early publication history of science fiction, *Science Fiction: The Early Years*, Everett F. Bleiler captures the way this ideological assumption of energy progress is registered in the science fiction of the turn of the century. Noting that he has chosen not to record conventional energy and electricity systems at all—that is, fossil fuels—Bleiler goes on to list nearly three dozen futuristic energy sources, ranging from atomic energy and solar energy to “ether flow,” Vril, and “Zodiacal force.”¹⁷ In the follow-up, *Science Fiction: The Gernsback Years*, which covers the decades following the initial publication of *Amazing Stories* in 1926, the list of “new and unusual sources” of energy adds cosmic energy, feline static electricity, the newly discovered so-lunar ray, repulsion vortices, and space mirrors to its list of possible replacements for oil and coal.¹⁸ In his work Szeman groups these kinds of fantasies—so influential that they remain the default futurological assumption of most political discourse surrounding energy policy, despite the fact that their grandiose promises of postscarcity existence have thus far entirely failed to deliver results—under the general category of “techno-utopianism.” As he puts it:

The utopia I have in mind here is the “bad utopia” of future dreamscapes and fanciful political confections—“utopia” not quite just as an insulting slur against one’s enemies, but rather as a projection of an alternative future that is, in fact, anything but a “conception of systematic

otherness.” . . . All of our worst fears about the chaos that will ensue when oil runs out are resolved through scientific innovations that are in perfect synchrony with the operations of the capitalist economy: problem solved, without the need for radical ruptures or alterations in political and social life.¹⁹

Oil’s scarcity is thus recast as a mere technicality: we will simply invent something that can do everything oil can do without the drawback of being scarce! The perpetual-motion-machine logic of this fantasy recalls for me Kim Stanley Robinson’s critique of the rhetoric of sustainability: “It doesn’t even mean sustainable anymore. It means: let us continue to do what we’re doing, but somehow get away with it. By some magic waving of the hands, or some techno silver bullet, suddenly we can make it all right to continue in all our current habits.”²⁰

The science-fictional fantasy of oil replacement goes further still, of course, by bracketing the negative externalities of oil as soon-to-be obsolete, and thus unimportant in the larger scheme of human history. All that is terrible about oil and other fossil fuels—including the brutal labor conditions required to extract them from the ground, the imperial violence needed to secure and stabilize their flows, the vast pollution they cause, *and* their inevitable, eventual exhaustion—is thus reimagined as but a temporary unpleasant blip in the long march of progress. H. G. Wells’s 1914 *The World Set Free*—said to have inspired physicist Leó Szilárd in his discovery of real-world nuclear reaction in the mid-1930s—lays out this narrative of progress explicitly. Human history, reads the first sentence of the novel, “is the history of the attainment of external power,” with oil imagined as an early turning point in that history.²¹ But with the discovery of atomic power, oil and other fossil fuels are abandoned almost overnight:

It was in 1953 that the first Holsten-Roberts engine brought induced radio-activity into the sphere of industrial production, and its first general use was to replace the steam-engine in electrical generating stations. . . . The American Kemp engine, differing widely in principle but equally practicable, and the Krupp-Erlanger came hard upon the heels of this, and by the autumn of 1954 a gigantic replacement of industrial methods and machinery was in progress all about the habitable globe. Small wonder was this when the cost, even of these earliest and clumsiest of atomic engines, is compared with that of the power they superseded. Allowing for lubrication the Dass-Tata engine, once it was started cost a penny to run thirty-seven miles, and added only nine and quarter pounds to the weight of the carriage it drove. It made the heavy alcohol-driven automobile of the time ridiculous in appearance as well as preposterously costly. For many years the price of coal and every form of liquid fuel had been clambering to levels that made even the revival of the draft horse seem a practicable possibility, and now with the abrupt relaxation of this stringency, the change in appearance of the traffic upon the world’s roads was instantaneous. In three years the frightful armoured monsters that had hooted and smoked and thundered about the world for four awful decades were swept away to the dealers in old metal, and the highways thronged with light and clean and shimmering shapes of silvered steel.²²

Indeed, nuclear energy in the novel is so obscenely cost effective that its sudden introduction (and the subsequent scrapping of the now-redundant sectors of the economy linked to the earlier energy mode) causes a severe economic depression.²³

The future-history novels of Isaac Asimov are similarly exemplary of this phenomenon. On the rare occasions that Asimov's characters mention oil and coal at all, it is with the horror that a contemporary citizen of democracy might speak of cannibalism or slavery. In Asimov's *Foundation* novels—first serialized in *Astounding Science Fiction* beginning in 1942, and depicting the collapse of a Galactic Empire into a millennia-long dark age—one of the earliest markers of this slide into barbarism is the loss of the nuclear-powered economy and the return to fossil fuels: “After the disintegration of the First Empire, there came the fragmentation of organized science, back, back—*past even* the fundamentals of nuclear power into the chemical power of coal and oil” (emphasis mine).²⁴ Asimov's other novels echo this projective investment in a post-oil future. In *The End of Eternity*, a time-travel novel, one of the time travelers is forced to make do with a “clumsy diesel engine” after being permanently trapped in what he sees as the distant, barbaric past, our time;²⁵ at the end of *I, Robot*, one of the markers of Atomic Age Utopia in Africa is precisely their possession of “untouched” oil and coalfields, in contrast to every other major power in the world.²⁶ Even in Asimov's sole attempt at writing for the comics medium, the unfinished *Star Empire*, the notes for the artist describe the “panorama of a futuristic city. Tall, graceful uncrowded buildings with lots of greenery between symmetrical developments” include a line indicating “there was no coal or oil smoke, no gas fumes or ground traffic.”²⁷ Asimov's sidelong references to oil and his repeated insistence on oil's *absence* as a marker of human progress are unique in the period only insofar as he bothers to mention the existence of oil at all—most science fiction of this period simply takes for granted that the wonders of the future will be powered by clean atomic energy “too cheap to meter,” in the famously unfulfilled slogan of the nuclear industry.

Scarcity and Collapse

Of course not *all* midcentury science-fiction texts take such an uncomplicatedly rosy view of the future—several key texts take early notice of the concerns over access to oil that would come to dominate world politics in the late twentieth century. In Olaf Stapledon's *Last and First Men* (1930), for instance—a hyperbolic view-from-ten-thousand-feet of the billion-year history of the

human race and its subsequent evolution into the second, third, and fourth through eighteenth races of men—the basic scarcity of oil and coal becomes a long-term problem for the human race over millennia, driving both war and the formation of a world state to strictly regulate the use of oil only when absolutely necessary. Even this level of intervention is insufficient to prevent the final collapse of the civilization of the first men: the Second Men and all subsequent evolutions of *Homo sapiens* have to make do without any oil or coal at all.²⁸ In Wells's *The World Set Free*, discussed above, this is the fate facing mankind before the invention of atomic energy:

It is part of my business to understand economics, and from that point of view the century before Holsten was just a hundred years' crescendo of waste. Only the extreme individualism of that period, only its utter want of any collective understanding or purpose can explain that waste. Mankind used up material—insanely. They had got through three-quarters of all the coal in the planet, they had used up most of the oil, they had swept away their forests, and they were running short of tin and copper. . . . The system was already staggering when Holsten began his researches. So far as the world in general went there was no sense of danger and no desire for inquiry. They had no belief that science could save them, nor any idea that there was a need to be saved. They could not, they would not, see the gulf beneath their feet.²⁹

In *The Man Who Awoke* series of stories by Laurence Manning, beginning in 1933, later anthologized by Asimov for his collection *Before the Golden Age*, the same diagnosis is made, but the fantasized “solution” is on a far longer timetable. Here Norman Winters, a twentieth-century Rip Van Winkle pastiche, sleeps for millennia to visit all future eras of human development; when he awakes, the protagonist is confronted by a future that is still furious at the loss of these tremendously useful natural resources. The Chief Forester of a civilization three thousand years in the future denounces the ruinous cultural practices of our “age of waste”:

The height of the false civilization of Waste! Fossil plants were ruthlessly burned in furnaces to provide heat; petroleum was consumed by the billion barrels; cheap metal cars were built and thrown away to rust after a few years' use; men crowded into ill-ventilated villages of a million inhabitants—some historians say several million . . . for what should we thank the humans of three thousand years ago? For exhausting the coal supplies of the world? For leaving us no petroleum for our chemical factories? For destroying the forests on whole mountain ranges and letting the soil erode into the valleys?³⁰

Winters can only offer his apologies: “I understand you have a very poor opinion of my own times, due to our possibly unwise consumption of natural resources. Even then we had men who warned us against our course of action, but we acted in the belief that when oil and coal were gone mankind would produce some new fuel to take their place.”³¹

Asimov later credited Manning for his own recognition of an impending oil crisis and the

need for alternative energy to prevent it: “In the 1970s, everyone is aware of, and achingly involved in, the energy crisis. Manning was aware of it forty years ago, and because he was, I was, and so, I’m sure, were many thoughtful young science fiction readers.”³² Here science fiction’s ability to diagnose, popularize, and educate becomes a point in its favor over and above more “mainstream” literary practices. In the same interview in which he denounces fashionable rhetorics of “sustainable development,” Kim Stanley Robinson similarly links the sort of thinking under way in *The Man Who Awoke* to the ethical-political role science fiction might play in cultural discourse:

It’s almost as if a science fiction writer’s job is to represent the unborn humanity that will inherit this place—you’re speaking *from* the future and *for* the future. And you try to speak for them by envisioning scenarios that show them either doing things better or doing things worse—but you’re also alerting the generations alive right now that these people have a voice in history.

The future needs to be taken into account by the current system, which regularly steals from it in order to pad our ridiculous current lifestyle.³³

Unhappily, however, such recognitions of the futurological consequences of oil’s profound scarcity are comparatively rare in early and mid-twentieth-century science fiction; the index for Bleiler’s *Science Fiction: The Early Years*, has no entries for either oil or fossil fuels, and *The Gernsback Years* notes only a handful.³⁴

The crucial turning point for a more complete cognitive mapping of oil and oil capitalism in science fiction might well be Frank Herbert’s *Dune*, published in 1965. *Dune* famously transmogrifies oil imperialism into a battle for control of the “spice” that makes interstellar navigation possible; spice, the necessary fuel for this futuristic multiglobal economy can only be found on the desert planet Arrakis, whose indigenous Fremen resist planetary occupation and, in the closing chapters of the first novel, having taken control of their planet’s spice reserves under the control of a charismatic religious leader, threaten to unleash an intergalactic “jihad.”³⁵ *Dune* not only anticipates later developments in Middle Eastern politics, but captures the nightmare of history Amitav Ghosh describes as resulting from the “oil encounter”:

To the principal protagonists in the Oil Encounter (which means, in effect, America and Americans on the one hand and the peoples of the Arabian Peninsula and the Persian Gulf on the other), the history of oil is a matter of embarrassment verging on the unspeakable, the pornographic.³⁶

We go to war in the Middle East, both Bush I and Bush II explained, in order to “protect our way of life,” which is predicated on the low-cost availability of petroleum fuel (oil) and petroleum

products (plastics); the spice, they may as well have said, must flow.

Dune registers not only the geopolitical fragility of the oil supply but also its general scarcity: spice is needed for galactic commerce but can *only* be found on Arrakis. In this sense *Dune* writes the history of the American 1970s before it starts. M. King Hubbert became nationally famous in 1970 when his 1956 prediction of peak U.S. oil production proved accurate. Hubbert defined a bell-shaped curve for annual oil extraction and production, which peaks when you have extracted roughly half the oil from your reserves.³⁷ On the upward part of the curve, oil appears plentiful—recall that at the start of the oil age in the United States oil was literally seeping up out of the ground, and could be scooped up in buckets—but as extraction continues oil becomes more difficult to find and retrieve. The peak marks the moment of maximum extraction; after this point, there is an inevitable decline. The EROEI of oil has trended sharply downward ever since the inauguration of the oil economy: from 100:1 to 30:1 in the 1970s to approximately 11:1 on average in the 2000s.³⁸ The historical narrative of oil capitalism is in this respect necessarily declensionist: as each year brings oil that is both harder to find and harder to extract than what had been available before, each year brings us closer to the end of capitalism as we have come to know it. Every American president dating back to Richard Nixon has used an “addiction” metaphor to describe the relationship of the U.S. economy to oil, especially foreign oil³⁹—and this trend line too suggests the diminishing returns of the “addicts’ high” (and perhaps that the referent of the addiction metaphor has slowly slipped from alcohol to heroin as the situation has progressed without material progress toward a solution).

The Club of Rome published its paradigm-shifting book, *The Limits to Growth*, in 1972. In 1973, the OPEC embargo on oil sales to nations that had supported Israel in the Yom Kippur War (also known as the Fourth Arab-Israeli War) led to national rationing and gas lines, as well as contributing to the worst domestic recession since the Great Depression (and the worst until the current crisis).⁴⁰ The year 1973 in general marks a striking moment of transition for postwar U.S. hegemony—it is the year of Watergate, the withdrawal from Vietnam, the collapse of the Bretton Woods monetary system, and the passage of the Endangered Species Act, among other notable benchmarks of *limit*—but first and foremost, 1973 is the year of the oil shock, the year the reality of capitalism’s dependence on a finite, nonrenewable energy was made inescapably clear and painfully immediate. Crucially for the study of science fiction, 1973 is also the first year since 1961 without a planned manned mission to the Moon, that “first step” toward the

“High Frontier” of inevitable extraplanetary expansion to which humanity has still never returned. Instead, our future has turned out to be terrestrial, and quite literally running out of gas. “Nature guards her treasures jealously,” proclaims the ad for Knox Oil and Gas that begins the 1983 film *Local Hero*, directed by Bill Forsyth: “Just a decade ago these fields were beyond reach: we didn’t have the technology. Today a Knox engineer will tell you that he might need a little time, but he’ll get the oil. He knows that a little time is all we have left.”⁴¹

Myriad science fictions of the 1970s, taking a far more pessimistic and political tact than the earlier science fiction of Wells, Manning, and Asimov, attempt to register this crisis and imagine possible solutions to it, but frequently stumble both on the scientific details and on the pessimistic intuition that there simply *is* no viable solution. In Asimov’s own *The Gods Themselves* (1972), the energy crisis is solved by the invention of a miraculous solar “pump” that would be the perfect green energy source—if only it weren’t stealing its free energy from the universe next door. In Ursula K. Le Guin’s “ambiguous utopia” *The Dispossessed*, the rich planet Urras is able to survive its parallel energy crisis only by instituting onerous controls on all aspects of consumer capitalism, especially oil. Earth in the novel made no such moves, and a cataclysmic nuclear war was the result. In Ernest Callenbach’s *Ecotopia*, which has lent its name to an entire subgenre of science fictional “happy endings,” part of the “utopia” involves the abolition of the automobile and a switch to renewable forms of energy, including in the end a switch to a fantastic form of fully green energy derived (somehow, miraculously) directly from chlorophyll.

Despite all sense of urgency, then, these fantasies ultimately endorse Szeman’s sense that “oil capital seems to represent a stage that neither capitalism nor its opponents can think beyond” (806–7). This postoptimistic sense of the future is registered in the most undeniable terms in Sid Meier’s *Civilization* franchise of computer games, from the 1990s, which allow the player to run a millennial-spanning empire from the foundation of its capital city in 4000 BC to the launching of the first space colonists to Alpha Centauri near the year 2000. But even in *Civilization*, it turns out, there is nothing after a petroleum economy. Once you hit our moment, the technological tree simply stops progressing altogether; the only technologies you can research are called “Future Tech 1,” followed by “Future Tech 2,” and so on. The progress that had once seemed inevitable can now no longer be named at all.

In 1981, William Gibson likewise imagined that longed-for next stage of history—the

sparkling but unrealized *Star Trek* cornucopia we once called “the future”—as a ghost haunting our dingier, dustier present:

They were the children of Dialta Downes’s ’80-that-wasn’t; they were Heirs to the Dream. They were white, blond, and they probably had blue eyes. They were American. Dialta had said that the Future had come to America first, but had finally passed it by. But not here, in the heart of the Dream. Here, we’d gone on and on, in a dream logic that knew nothing of pollution, the finite bounds of fossil fuel, or foreign wars it was possible to lose. They were smug, happy, and utterly content with themselves and their world.⁴²

Our future, the implication is, will be anything but smug and happy. The first oil panic of 1973 is now forty years in the past, but we seem no further from the *Mad Max*–style ruins of a world without oil; indeed, we seem totally uninterested in any serious investment in energy despite both the inevitability of peak oil and the growing threat of climate change. Even knowing the oil is running out, even knowing the oil we have yet to burn will poison the climate, the only thing we can think to do is drill harder—and we need think only of the familiar “drill baby drill” refrain of the Tea Party movement to see the fantastic political appeal of this sort of denialism in action. “Nobody gets beyond a petroleum economy,” one of the chapters in Dan Simmons’s extraplanetary *Hyperion* series remarks sadly. “Not while there’s petroleum there.”⁴³ The Larry Niven fantasy series “The Magic Goes Away” (1976) cleverly merges the melancholic anticipation of peak-oil collapse with the mournful nostalgia for the past that is characteristic of the fantasy genre: in that world it is not oil, but the manna that powers magic, that is running out. But of course this is our world exactly—the magic of the twentieth century is slipping through our fingers, the present already lost to history even as we live it.

In the absence of some sufficient substitute for oil’s energy miracle—in the absence, that is, of a future that is both prosperous and *possible*—the only solution for the imagination seems to be to cast itself back into the past in search of the secret of what’s to come. Isaac Asimov himself—having perhaps finally abandoned the teleological historical progressivism of his earlier work—takes up this direction in a 1977 *Time* essay titled “The Nightmare Life without Fuel,” which finds the world of 1997 being slowly dismantled and demolished, automobiles vanished, and all energy substitutes stalled: “Anyone older than ten can remember automobiles. They dwindled.” Meanwhile the country is filled with starving wretches felled by snowstorm and disease: “Where will it end? It must end in a return to the days before 1800, to the days before the fossil fuels powered a vast machine industry and technology. It must end in subsistence

farming and in a world population reduced by starvation, disease and violence to less than a billion.”⁴⁴ James Howard Kunstler (a leading Jeremiah of the coming post-oil “long emergency”) explores this kind of “retrofuture” in his 2008 novel *World Made by Hand*, which sees only one conceivable alternative to the current global oil economy: a return to the hyperlocal artisan economy of the early nineteenth-century United States.

In Paolo Bacigalupi’s 2009 science-fiction novel *The Wind-Up Girl*, set in the postcarbon, postclimate-change twenty-third century, we find another imagined endpoint of this downward trajectory. The end of oil is recognized in retrospect as the end to both globalization and U.S./Western hegemony, sparking a century-long period of breakdown and disaster known as “The Contraction.” The novel’s protagonist, Anderson Lake, a representative of food conglomerate AgriGen, is described early in the text as “Flotsam of the old Expansion. An ancient piece of driftwood left at high tide, from a time when petroleum was cheap and men and women crossed the globe in hours instead of weeks.”⁴⁵ To the people of this time, the oil age is remembered as a distant “golden age”—but one that is permanently and hopelessly in the past, never to return. Robert Charles Wilson’s *Julian Comstock* (2009), too, similarly envisions the postpetroleum world as the return of obsolete historical social forms. The contemporary era has come to be remembered by the people of 2172 as the “Efflorescence of Oil,” the word “efflorescence” describing the evaporating of water that leaves behind a thin layer of salty detritus.⁴⁶ Here that detritus is the ruined remains of our own twentieth- and twenty-first-century lives: the hardship and dislocation of global collapse, the inscrutable plastic junk that litters their countryside, their myths that man once walked on the moon, a generally ruined world. American life has become much more technologically constrained, along the lines of the pre-oil world; New York is considered the greatest city in the world in part because it still manages electrical illumination for four hours every day. The unholy combination of the end of oil with global warming has decimated the world’s population through starvation, deprivation, and disease; the society that has ultimately emerged out of the disaster has abandoned science, reason, and democracy in favor of superstition, theocracy, and authoritarianism—science fiction recasting its future not as progress but as hopeless regression. Here, then, is what science fiction looks like without (or after) the future: the twentieth century is envisioned not as the launching pad for a glorious technofuture but as an anomalous moment of prosperity and historical possibility that quickly burns itself out, leaving in its place the worst combination of Manifest Destiny America,

feudal Europe, and decadent Rome.

Rock Bottom and Recovery

If the end of oil is indeed, as Imre Szeman writes, “the biggest disaster that ‘we’ collectively face,” it is only because its time scale seems to be the most immediate—the long century boil of climate change seems leisurely in comparison to a global petroleum peak that could come within a decade, or the next few years, or perhaps has already arrived. But this urgency carries with it an opportunity; the very immediacy of the crisis means that oil is simultaneously the Archimedian point best at hand from which we might intervene and start to move the world. The end of oil, as we have seen, fuels at once both Utopia and dystopia: it is the crisis that breaks the world into ruin but also the opportunity out of which the possibility of another world might emerge. Here again we can find science-fictional imaginings retreating from the cold, rational calculus of energy scarcity into something more like fantasy—only in our moment the fantasy is not of improbable technology and perpetual-motion hacking of the laws of physics, but rather that human beings might change the way they behave.

Moon, a film from 2009, announces in its opening minutes that capitalism has finally solved all the problems at last: a diegetic, in-universe commercial from Lunar Energy announces that helium mining on the moon allows enough essentially free energy to fuel the planet without drilling for oil, despoiling environments, and ruining the lives of smiling Third World children.⁴⁷ But it turns out that there is still a cost to all this. Literalizing the ethical rupture at the heart of Ursula K. Le Guin’s short story “The Ones Who Walk Away from Omelas,” we have now a single human being who is forced to live in misery to provide all this free energy to the world: Sam Bell, who has to live on the moon to oversee the mining operation, perhaps the worst job in Utopia. And it gets worse for poor Sam; while he believes he is only on the moon for a lucrative three-year contract, in fact he will never leave; he is clone #5 in a series of Sams, each of whom has been implanted with the memories of the original Sam and each of whom has approximately a three-year life span until he must be replaced. The horror of the movie is the shock of discovering the true costs of a world of plenty—and the ultimate utopian fantasy of the movie is that this situation *would* actually be rejected by the public at large, if only the truth were known. In the end the Sams are able to work together to get one of them off the Moon and back to Earth to expose what is going on, and in the film’s final shot it is revealed that Lunar Energy’s stocks

have tanked.

At the core of James Cameron's allegorical *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, there is a parallel fantasy that the smooth functioning of global (now *interplanetary*) capitalism and the familiar violence of its history might somehow be *interrupted*. What if, on Pandora, the normal circuit between oil capitalism and imperial power could be broken? The desire for this radical transformation is so strong that it leads even the film's domestic audiences to root against a "Space Marine" stand-in for 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 turning traitor, leading a successful guerrilla resistance, and ultimately forcing the imperialists off the planet. At the end of the film his reward 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. Now living in another body, part of another global history, he is free to lead another, better life.⁴⁸

A similar miracle takes place at the end of little-seen box-office-flop *Daybreakers* (also from 2009), which literalizes 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."⁴⁹ A decade after an outbreak that has turned the national elite into vampires, in *Daybreakers*' 2019 there are no longer enough unaltered humans left to feed the 1%'s unquenchable thirst for blood. Vampires who go without blood for too long become, in a horror-movie figuration of drug addiction, monstrous "subsiders" who attack anything that moves; as the film opens, the subsider crisis is just reaching the suburbs. Coffee shops advertise that they "still sell 20% blood"; "blood riots" rock the Third World. But the signs of the coming crash are everywhere; with all hope for an energy substitute stalled, America has reached "peak blood." The solution here is again personal transformation, but now with a twist. It turns out that through controlled exposure to the sun—literal *enlightenment*—vampires can be cured. And 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 social revolution, operating through an epidemiological network—friend to friend, relative to relative, coworker to coworker—with the power to slowly transform a society of vampire-consumers back into human beings once again.⁵⁰

The utopian, even quasi-religious, fantasy in all three narratives is the dream of salvation: that the nightmare of exploitation, and our own complicity in these practices, might somehow be stopped, *despite* our inability to change. All three films uncover this sense of hope in personal transformation, in epiphanies located in the individual but potentially accessible to all. 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 A.A.'s "Higher Power." As Kierkegaard put it in an epigram sometimes invoked by Darko Suvin, "We literally do not want to be what we are."⁵¹ 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—which means, à la *Daybreakers*, somehow pushing those personal transformations past the level of the individual into collective experience and society-wide change. Naomi Klein has similarly captured the revolutionary political sensibility that is being called into existence by allegorical texts like *Avatar*, *Moon*, and *Daybreakers*:

We all know, or at least sense, that the world is upside down: we act as if there is no end to what is actually finite—fossil fuels and the atmospheric space to absorb their emissions. And we act as if there are strict and immovable limits to what is actually bountiful—the financial resources to build the kind of society we need. The task of our time is to turn this around: to challenge this false scarcity. To insist that we can afford to build a decent, inclusive society—while at the same time, respect the real limits to what the earth can take.⁵²

That, one supposes, or else begin practicing the apology to the future offered by Kurt Vonnegut in a late work: "Dear future generations, please accept our apologies. We were roaring drunk on petroleum."⁵³

Notes

¹ Fredric Jameson, *The Geopolitical Aesthetic* (Bloomington: Indiana University Press, 1995), 169.

² Italo Calvino, "The Petrol Pump," *Numbers in the Dark and Other Stories*, trans. Tim Parks (London: Jonathan Cape, 1995), 174.

³ Dipesh Chakrabarty, "The Climate of History: Four Theses," *Critical Inquiry* 35 (Winter 2009): 208. See also Timothy Mitchell, *Carbon Democracy: Political Power in the Age of Oil* (New York: Verso, 2011).

⁴ Timothy Morton, *The Ecological Thought* (Cambridge: Harvard University Press, 2010), 19. The concept is further developed on pages 130–35 and developed further still in his book *Hyperobjects* (University of Minnesota Press, 2013).

⁵ Steven Shaviri, "Hyperbolic Futures: Speculative Finance and Speculative Fiction," *The Cascadia Subduction*

Zone 1, no. 2 (April 2011): 4.

⁶ Chad Harbach, "The Politics of Fear, Part III: Business as Usual," *n+1*, December 4, 2007,

<http://nplusonemag.com/politics-fear-part-iii-business-usual>.

⁷ Wendell Berry, "Faustian Economics: Hell Hath No Limits," *Harper's*, May 2008, 36.

⁸ Benjamin Kunkel, "The Politics of Fear, Part II: How Many of Us?," *n+1*, March 18, 2008,

<http://nplusonemag.com/politics-fear-part-ii-how-many-us>.

⁹ Imre Szeman, "System Failure: Oil, Futurity, and the Anticipation of Disaster," *South Atlantic Quarterly* 106, no. 4 (Fall 2007): 806.

¹⁰ Quoted in Retort (Iain Boal, T. J. Clark, Joseph Matthews, and Michael Watts), *Afflicted Powers: Capital and Spectacle in a New Age of War* (New York: Verso, 2005), 40.

¹¹ John Bellamy Foster, *Ecology Against Capitalism* (New York: Monthly Review Press, 2002).

¹² F. T. Marinetti, "Futurist Manifesto," in *Critical Writings*, trans. Doug Thompson (New York: Macmillan, 2006).

¹³ Maria Goretti, "Petroleum Song," *Futurism: An Anthology*, ed. Lawrence Rainey, Christine Poggi, and Laura Whitman (New Haven: Yale University Press, 2009): 476–79.

¹⁴ Buckminster Fuller, *Operating Manual for Spaceship Earth* (Zurich: Lars Müller Publishers, 2008), 128–29.

¹⁵ Foster, *Ecology Against Capitalism*, 122.

¹⁶ Naomi Klein, "Climate Rage," NaomiKlein.org, November 11, 2009.

<http://www.naomiklein.org/articles/2009/11/climate-rage>. This essay was originally published in *Rolling Stone*.

¹⁷ Everett F. Bleiler, *Science Fiction: The Early Years* (Kent, Ohio: Kent State University Press, 1990), 875–76.

¹⁸ Everett F. Bleiler with Richard Bleiler, *Science Fiction: The Gernsback Years* (Kent, Ohio: Kent State University Press, 1998), 638.

¹⁹ Szeman, "System Failure," 813.

²⁰ Geoff Manaugh, "Comparative Planetology: An Interview with Kim Stanley Robinson," BLDGBLOG,

December 19, 2007, <http://bldgblog.blogspot.com/2007/12/comparative-planetology-interview-with.html>.

²¹ H. G. Wells, *The World Set Free* (London: Macmillan and Co., 1914), 1.

²² *Ibid.*, 41–42.

²³ *Ibid.*, 44–45. The rest of the novel details the creation of a utopian state on the back of the atomic energy revolution, beginning (as is characteristic of Wells in this period) with a devastating atomic war as the energy source is weaponized, and the subsequent creation of a World State to regulate the atom and demilitarize the planet.

²⁴ Isaac Asimov, *Second Foundation* (New York: Spectra, 1991), 114. This event is mentioned in each of the first three Foundation novels, making clear the importance of transcending oil to Asimov's vision of the future.

²⁵ Isaac Asimov, *The End of Eternity* (New York: Tor, 2010), 162.

²⁶ Isaac Asimov, *I, Robot* (New York: Bantam Books, 1991), 211.

²⁷ Isaac Asimov, notes for *Star Empire* (unpublished), Asimov Collection, Howard Gotlieb Archival Research Center, Boston University, box 7d.

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- ²⁸ Olaf Stapledon, *Last and First Men and Star Maker* (New York: Dover Publications, 1968).
- ²⁹ Wells, *The World Set Free*, 263–64.
- ³⁰ Laurence Manning, *The Man Who Awoke* (New York: Ballantine, 1975), 20–21.
- ³¹ *Ibid.*, 25.
- ³² Isaac Asimov, ed., *Before the Golden Age* (Garden City: Doubleday, 1974), 344. Thanks to Michael Page for bringing this quote to my attention in his own excellent work on oil-age science fiction.
- ³³ Managh. “Comparative Planetology.”
- ³⁴ Bleiler, *Gernsback Years*, 669.
- ³⁵ Herbert, Frank, *Dune: 40th Anniversary Edition* (New York: Ace Trade, 2005), 482. See also the well-known film adaptation: *Dune*, dir. David Lynch (1984; Orlando, Fla.: Universal Studios, 1998), DVD.
- ³⁶ Amitav Ghosh, “Petrofiction—*The Trench* by Abdelrahman Munif,” *The New Republic*, March 2, 1992, 29.
- ³⁷ M. King Hubbert, “Nuclear Energy and the Fossil Fuels,” presentation before the American Petroleum Institute (March 7–9, 1956). Notes from this talk are available at <http://www.hubbertpeak.com/hubbert/1956/1956.pdf>.
- ³⁸ See, for instance, Charles Hall, “Why EROEI Matters (Part 1 of 6),” TheOilDrum.com, April 1, 2008. <http://www.theoildrum.com/node/3786>.
- ³⁹ A July 16, 2010, segment on *The Daily Show* offers an amusing supercut of each of these presidents making nearly identical statements about oil dependence. See “An Energy-Independent Future” at thedailyshow.com.
- ⁴⁰ This moment of “oil shock” is of course repeated in 1979, after the Iranian Revolution, and echoed again both in the 2000s oil price spikes and in the gas lines found in New York and New Jersey after 2012’s Hurricane Sandy.
- ⁴¹ *Local Hero*, directed by Bill Forsyth (1983; Burbank, Calif.: Warner Home Video, 1999), DVD.
- ⁴² William Gibson, “The Gernsback Continuum,” *Burning Chrome* (New York: Harper Voyager, 2003): 24–37 (34).
- ⁴³ Dan Simmons, *Hyperion* (New York: Spectra Books, 1990), 449.
- ⁴⁴ Issac Asimov, “The Nightmare Life without Fuel.” *Time*, April 25, 1977. Available at time.com. We are now, alas, almost as distant from Asimov’s “Nightmare” 1997 as he was when he made this call for urgent change:
- And what can we do to prevent all this now?
Now? Almost nothing.
If we had started 20 years ago, that might have been another matter. If we had only started 50 years ago, it would have been easy.
- ⁴⁵ Paolo Bacigalupi, *The Wind-Up Girl* (San Francisco: Night Shade Books, 2009), 16.
- ⁴⁶ Robert Charles Wilson, *Julian Comstock: A Novel of 22nd-Century America* (Tor Books, 2009), 30.
- ⁴⁷ *Moon*, directed by Duncan Jones (2009; Los Angeles: Sony Pictures Classics, 2010), DVD.
- ⁴⁸ *Avatar*, directed by James Cameron (2009; Los Angeles: Twentieth Century Fox, 2010), DVD.
- ⁴⁹ Karl Marx, *Capital, Vol. 1* (New York: Penguin Books, 1976), 342.
- ⁵⁰ *Daybreakers*, directed by Michael Spierig and Peter Spierig (2009; Santa Monica, Calif.: Lionsgate, 2010), DVD.
- ⁵¹ Quoted in Darko Suvin, *Defined by a Hollow: Essays on Utopia, Science Fiction, and Political Epistemology*

(London: Peter Lang, 2010), 218.

⁵² Klein, "Climate Rage."

⁵³ Quoted in Jacqueline Blais, "Vonnegut 'still had hope in his heart,'" USAToday.com, April 13, 2007.