Manhattan Heat Transfer: Energy and the Climate Unconscious in Modernist Visions of the American Metropolis

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> Heat. This is what cities mean to me. You get off the train and walk out of the station and you are hit with full blast. The heat of air, traffic, and people. The heat of food and sex. The heat of tall buildings. The heat that floats out of the subways and the tunnels. It's always fifteen degrees hotter in the cities. Heat rises from the sidewalks and falls from the poisoned sky. The buses breathe heat. Heat emanates from crowds of shoppers and office workers. The entire infrastructure is based on heat, desperately uses up heat, breeds more heat. The eventual heat death of the universe that scientists love to talk about is already well underway and you can feel it happening all around you in any large or medium-sized city.
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> — Don DeLillo, *White Noise*

The Sublimated City

All that is solid melts into air. Written roughly a decade before Eunice Foote was the first to discover a positive correlation between carbon dioxide levels and atmospheric heat absorption (Foote 1856)—now known as the greenhouse effect—the perhaps most frequently reprinted line from Marx and Engels's *Communist Manifesto* articulates the advent of modernity as an intervention into climate. As a liberal translation of the German *alles Ständische und Stehende verdampft*, it invokes the evaporation of both feudal structures and architecture,

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solid relations and solid matter. In the context of the Anthropocene and global heating, whose roots are frequently traced to the fossil-fueled regime of the steam engine (Crutzen and Steffen 2003; Malm 2016), I suggest taking literally the transformation of solids into air as a symptom of bourgeois capitalism. Marx and Engels's phrase signifies a process of sublimation in the twofold sense of a physical phase transition from solid to gas and a psychological translation of the unconscious into cultural activity. The rise of modernity is driven by the combustion of coal and overshadowed by an unprecedented emission of gaseous waste products into the air. By the mid-nineteenth century, CO_2 levels had surpassed all previously recorded maxima (Bonneuil and Fressoz 2017, 16), and in 1890, "more than half of global energy [came] from fossil fuels," as Jordan B. Kinder and Imre Szeman point out (2020, 90). Following the analytic of what contemporary energy scholars examine as "petromodernity" (LeMenager 2014, 67), I would like to argue that the climatological implications of this steep incline in fossil fuel consumption is both omnipresent and obscured in the aesthetics of American modernism, a cultural formation inextricable from the rise of the modern metropolis and the apotheosis of what Andreas Malm (2016) calls fossil capital. This argument links up with a recent surge in important conversations between new modernist studies and the energy humanities, such as Joshua Schuster's *The Ecology of Modernism* (2015), Andrew Kalaidjian's *Exhausted Ecologies* (2020), and Michael Rubenstein and Justin Neuman's *Modernism and Its Environments* (2020), which revisit the representations of energy regimes at the beginning of the twentieth century in relation to their environmental aesthetics and politics. Against the backdrop of recent propositions of the "Urbanocene" (Chwałczyk 2020) and the urgent need for new narratives of a future beyond fossil fuels, I read these revisionary investigations of modernism as effective critiques of a cultural inflection point not only in the history of global heating, urbanization, and fossil fuel consumption but also in the development of a sticky utopian imagination somewhere between images of city metabolism, techno-futurism, avant-garde experimentation, and what Schuster calls "regeneration through pollution" (2015, 1).

Even though "the beginnings of the massive transformation of air through pollution and rising carbon dioxide emissions in the course of the Industrial Revolution" coincide with "the birth of modern meteorology and climate science," as Eva Horn points out (2018, 14), the material entanglements between climate and human activity at the time remained largely unaddressed (cf. Badia et al. 2021, 2). In their introduction to *Climate Realism: The Aesthetics of Weather and Atmosphere in the Anthropocene* (2021), Lynn Badia, Marija Cetinić, and Jeff Diamanti point to a speech given by Marx to an audience of workers in 1856 where he compares the transformational power of "steam, electricity, and self-acting mule" to the weight of an oppressive yet imperceptible atmosphere: "although the atmosphere in which we live, [*sic*] weighs upon every one with a 20,000 lb. force, do you feel it?" (Marx 1969, 500). Air, or atmosphere, functions as the primordial signifier of an environmental relation that precisely, because of

its metabolic elementality, remains imperceptible. For Badia and colleagues, the metaphorical employment of atmosphere in this passage by Marx is telling, as it establishes a link between "the material force of a startlingly energy-intensive mode of industrial production" and "the material force of planetarity"—a relation that while "lurk[ing] at the edges of [industrial capitalism's] weather reports" came "bursting into full-blown anthropocentric climate change [only] once the energy [harnessed] for value production returned as the climate of our historical present" (Badia et al. 2021, 3). The return of climate and Badia and colleagues' call for a "climate realism" that proceeds from the estranged aesthetic of an observer enmeshed in the commingling material fluxes of industry, culture, and atmosphere links up with what in the latter parts of this article I call the climate unconscious of American modernism. As a heuristic framework, the climate unconscious calls for a consideration of the repressed, embodied, and sublimated dimensions of atmospheric energy entanglements. Both in a figurative and in a physical sense, the energetic affordances of the modern metropolis can be traced along the reciprocal exchanges between built environment and atmosphere.

The cover of the 1988 Penguin edition of Marshall Berman's influential study *All That Is Solid Melts into Air: The Experience of Modernity* is programmatic in this regard. It features an image of Howard Cook's 1930 lithograph *Lower Manhattan*, which displays the urban energy regime through the contrast of architectural bulk and illuminated air. Created at the dawn of the Great Depression and at the apex of New York City's second skyscraper craze, Cook's artwork shows a section of the city's skyline starkly silhouetted against a sooty twilight and triumphantly towering over steamships that congregate in the East River at the bottom of the image. Invoking the registers of the geometrical sublime (see Nye 1996, 77–108), the outlines of the skyscrapers are accentuated in a dramatic contrast of light and shade, creating an atmosphere of both ominous splendor and smog, or what Stephanie LeMenager calls "oil weather" (2014, 78). The modernist city in Cook's rendition radiates energy in the form of both waste heat and light. Similar to the coronated and cenotaphic skyscrapers in Hugh Ferriss's 1922 series *Study for Maximum Mass Permitted by the 1916 New York Zoning Law*, Cook's buildings are delineated by an ambiguous halo, shooting off streaks of white into the sky. Are these fugitive fumes of spent fossil fuels that emanate from hidden chimneys or diffuse beams of electric spotlights designed to stage the city as spectacle? This visual ambivalence might be understood as symptomatic of a shift in the American representation of energy in the early decades of the twentieth century from the material condition of its production to the cultural symbolism of its consumption. The polluted airs that pervade nineteenth-century images of industrial cityscapes give way to a glorified if not dream-like aesthetic of urban energy that is less concerned with atmospheric waste heat and carbon emissions than with visions of progress, techno-optimism, and cultural vibrancy. For Berman, the phrase by Marx and Engels prominently referenced in the title of his book signifies that "the heat that destroys is also superabundant energy" (1988, 89), an observation particularly applicable to the American metropolis. On

a visit to New York in 1906, H. G. Wells is struck by a city "lavish of light" and "full of the sense of spending from an inexhaustible supply" (quoted in Nye 2018, 6). In this sense, Cook's *Lower Manhattan* monumentalizes energy abundance through the vexing registers of illumination and evaporation. Similar to the gloriously electrified cityscapes of fellow artists such as Ferriss, Joseph Stella, or Georgia O'Keefe, Cook's image visualizes a tension between the exhaustion and, perhaps, compensatory glorification of energy in the modernist imaginary.

As the site of the world's first electrical power grid installed by Thomas Edison in 1881, lower Manhattan is the prototype of the electrified American city. In the context of the spectacular employment of incandescent lighting in expositions, commercial displays, and city design around the turn of the century—the invention of the tungsten lamp in 1904 facilitated the illumination of whole buildings with powerful floodlights—(Nye 2018, 174), Cook's scene is doubly conditioned by the combustion of fossil fuels. "During the Progressive era," as Nye points out, "electricity increasingly came from coal-fired power plants that polluted the air [and] reduced sunlight while exposing the lungs to noxious gases and soot particles" (2018, 6). Not only is the illumination of Cook's city enabled by coal fires, but the spectacle of light beams is enhanced by a reflective medium of exhaust and dust that saturates the urban atmosphere, an effect also deliberately explored in the use of "smoke bombs and steam" in the light design of New York City's Hudson-Fulton Celebration of 1909 (Nye 2018, 176). Paradoxically, the modern cityscape both obscures and materializes its energy entanglements. While the display of energy becomes the modern(ist) paradigm par excellence, especially with the advent of electricity, the physicality of its generation and climatological ramifications is rendered increasingly invisible (cf. Rubenstein and Neuman 2020, 24–56). Invoking the American of the electric age as "the servant of the powerhouse" in 1904, Henry Adams notes not without concern that "the new American showed his parentage proudly; he was the child of steam and the brother of the dynamo" (2015, 124). Eliciting a mixture of shock and awe, the enormous dynamos in the *Palais de l'Electricité* at the 1900 Paris World Fair for him famously represented a "moral force" and symbol of "ultimate energy," a sensation certainly heightened by their disassociation from the "tons of poor coal hidden in a dirty engine-house carefully kept out of sight" (101). "In contrast to the steam technologies that dominated early fairs," as Nye elaborates, "electricity was instantaneous and invisible, working according to principles few could grasp" (2018, 117). The transition from gas lamps to electric systems prompted the imagination of energy as "a single, inorganic form that passed through a consumer's devices and left nothing behind. The waste was displaced to distant mines, oil wells, power plants, and the like" (3). Solids melting into apparent nothingness, dirty engines carefully kept out of sight, and the invisibility of waste are powerful symbols of a modern energy regime in which concerns about climate change, ecology, and sustainability are virtually nonexistent.

With perhaps a similar point in mind, Darran Anderson revisits the Marxian adage in his sweeping study *Imaginary Cities*: "'All that is solid melts into air,' foretold Marx and perhaps nothing was solid to begin with. We see the shell, the carapace of dwellings and not the systems of power, waste, communication that are functioning in the walls, under the ground, through the sky" (2015, 409). In his reading, solidity becomes a cipher for the unacknowledged interior or infrastructural dimension of the modern metropolis. With reverberations of T. S. Eliot, modern architecture is hollow; modern architecture is stuffed—with pipes, wires, and ventilation systems designed to create a distance between the primary sites of energy consumption and the primary sites of energy extraction, production, and dissipation. In Cook's vexing image of piled-up buildings breathing light and fumes, petromodernity reveals itself as a condition where "energy has managed to hide in plain sight" (Kinder and Szeman 2020, 81), omnipresent yet concealed by layers of brick, steel, ornament, and metaphor so as to cleanse it from the material modes of its production. "Beneath the apparently solid surface, they betrayed oceans of liquid matter" (Marx 1969, 500). How prescient that the same speech invoking the atmosphere as heavy burden opens with a geomorphology of the 1848 revolutions that reads like a statement about the hidden infrastructure of petroleum underneath the modern cityscape.

Half a century after the 1859 discovery of oil in Pennsylvania and abetted by oil discoveries in Texas and aggressive U.S. investments in Middle Eastern oil fields in 1928, oil was on its way to eventually replacing coal as the nation's primary energy source in 1954 (U.S. Energy Information Administration 2011). Beginning in 1909, its rise runs parallel to if not correlates with the development of modernism in the American arts—from painting to architecture, music, and literature. As a cultural, political, and social lubricant, "oil is everywhere during the modernist era," as Joshua Schuster observes in his programmatically titled essay "Where Is the Oil in Modernism?" (2017, 196). And yet "oil—and, for that matter, most other raw non-renewable commodities—rarely appears directly in modernist art" (Schuster 2017, 196). This does not mean that oil is entirely invisible; rather, it is sublimated into a celebration of the experiences, aesthetic practices, and commodities it enables and sustains—speed, mobility, machines, light, cars, transience, cinema, skyscrapers, and so on. Insofar as the Italian futurists can be regarded as heralds of a particularly extravagant—and dangerous—techno-utopian sentiment that has also managed to infect American mentalities, modernism may have been born from "the use of energy and recklessness as common, daily practice" (Marinetti 2011, 63).

Building on what Amitav Ghosh has famously described as "the muteness of the Oil encounter" in American literature (2017, 432), many recent petroculture scholars have contributed to exposing and complicating the seeming invisibility of fossil fuels in twentieth-century art and fiction. In light of oil's absent presence, Peter Hitchcock in "Oil in an American Imaginary" calls for "an imaginative

grasp" of the "abstruse narrative of modernity, not in the mere content of oil's omnipresence, but in the very ways oil has fictively come to define so much of being in modernity" (2010, 81). In this light, energy humanities scholars since Patricia Yaeger have engaged American literature via its "energy unconscious" (Bellamy 2019; Macdonald 2016; Szeman and Boyer 2017, 8; Yaeger 2017, 442), a concept that, as Brent R. Bellamy explains, "attempts to name the unarticulated cultural logic whereby fossil fuels permeate human life yet remain unintelligible, though embedded across a whole range of practices" (2019). Part and parcel of explicating the energy unconscious, from its articulations in the mid-century road novel to late-capitalist science fiction, is to highlight the ways in which "energy invisibilities may [also] constitute different kinds of erasures" (Yaeger 2017, 443). Such different kinds of erasures include the ways in which the representation of energy implicitly or explicitly conceals sites of extraction and pollution, energy infrastructures, exploitative labor practices, class consciousness, and environmental racism. The energy unconscious and what I call the climate unconscious are intimately related as forms of amnesia regarding the ecological interdependencies among energy consumption, atmospheric emission, and the afterlife of resources. Whereas the concept of the energy unconscious points to the cultural mechanisms by which energy becomes disentangled from the modes of its production, the climate unconscious can be traced in the aesthetic operations that condition the imaginary separation of cultural industry and embodied subjectivity from the circulating, trans-corporeal flows and currents of the atmosphere. When resources apparently melt into air and become invisible as naturalized cultural ambient, both of these mechanisms of repression are entwined.

To understand the foundational nature of the energy unconscious, it is instructive to consider how energy waste is already inscribed in the second law of thermodynamics, the formulation of which by William Thomson and Rudolph Clausius around 1850 is inextricable from the rise of the steam engine (cf. Dagett 2019). It axiomatizes that every process of energy transformation dissipates energy, which means that even though the total amount of energy in a given closed system is conserved, its capacity to perform work decreases with every material interaction. Another way of saying the same thing is that every interaction among macroscopic material bodies converts energy and creates "waste," whether in the form of dispersed heat, dust, noise, exhaust, leakage, injury, or excrement. Even without consulting *Purity and Danger*, Mary Douglas's classic 1966 anthropological study of pollution, one can understand human civilization generally and Western modernity in particular as an elaborate exercise in the banishment of waste from consciousness. "That which escapes the boundaries must be evacuated, policed, made invisible," as Sara Daggett writes in *The Birth of Energy* (2019, 8). As an operation that relies on representation and imagination, this process is preeminently cultural. To draw attention to the energy unconscious is thus to reveal these mechanisms of cultural repression, to highlight the sites where the ramifications of energy consumption are displaced by fantasies of

social hygiene or technocultural utopia. It means reattaching cultural metaphors of heat, energy, or atmospheres to their material referents, connecting the pastoral or the sublime to its dirt, and tracing the dirt to its sources.

My aim in the following is to illustrate the cultural traces of the latent, sublimated, and entwined imagination of energy and climate in early twentieth-century American visions of progress by focusing on two literary texts that self-consciously engage the energy aesthetics of the 1920s–1940s metropolis. Perhaps counterintuitively, my first example is not a modernist text per se but a metacritique of the flawed futurist legacy of American modernism. Via a reading of William Gibson's 1981 short story "The Gernsback Continuum" (2003), I illustrate how the aesthetic of American modernism viewed through the mirror of the 1980s effectively conceals its energy entanglements behind surfaces of gleaming chrome and how atmospheric pollution is displaced by materialized metaphors of an obsolete utopia. Gibson's critical interrogation of past futures, I suggest, helps us understand why revisiting modernism through the lens of the energy humanities may be crucial for understanding the cultural deep structures of oil and how they need to be decentered in order to imagine a future after fossil fuels. As my second example, I read John Dos Passos's (2000) quintessentially modernist novel *Manhattan Transfer* (published in 1925) for traces of a synchronic cultural consciousness of the enmeshment between metropolitan subjectivity and climate. Not unlike Howard Cook's lithograph discussed above, the novel invokes the archetypal American metropolis as a simultaneous site of vibrant energy and complicated atmospheres. Inspired by Rubenstein and Neuman's "atmospheric reading" of the ways in which "atmospheric conditions could be unruly and conspicuous in modernist fictions, even when they were supposed to stay in the background" (2020, 23), I trace the novel's heightened concern with the situated conditions of energy dissipation and particularized atmospheres to argue that in *Manhattan Transfer*, climate, in fact, hides in plain sight.

The Sanitized City

In his 1981 short story "The Gernsback Continuum," William Gibson invokes the American techno-utopianism of the 1930s as a literalized phantasm that comes back to haunt the 1980s, a decade marked by the aftermath of a global energy crisis, austerity measures, climate deregulation, and the political rhetoric of a new Gilded Age. Told from the perspective of an unnamed photographer who has been commissioned to capture the material traces of American Streamlined Moderne, "a uniquely American form of architecture that most Americans are scarcely aware of" (2003, 25), Gibson's story reads like a guide to the aesthetic regime of petromodernism still surviving in the peripheries of the late twentieth-century city. On his mission, the protagonist's attention is drawn to "the movie marquees ribbed to radiate some mysterious energy, the dime stores faced with fluted aluminum" (Gibson 2003, 25), and to gas stations with "strange radiator flanges that. . . made them look as though they might generate potent bursts of raw technological enthusiasm" (28). As remnants of the 1920s–1940s, these

sites become symbolic of "a shadowy America-that-wasn't" (28), which reveled in fantasies of an energy-stoked future that never materialized outside the spheres of modernist architecture, industrial design, pulp science fiction, and movie theaters. It is telling that the protagonist goes "for the gas stations in a big way" (28).

Albeit less aggressively than the Italian futurists serenading "exhaust pipes like serpents with galvanic breath" (Marinetti 2011, 63), American modernism in building and design is married to what LeMenager calls "petroleum aesthetics" (2014, 6)—the ways in which oil, gas, and coal saturate petromodernity on a sensorial and affective level while remaining conspicuously absent from direct representation. Throughout the 1930s, gas stations, bus terminals, locomotives, and home appliances were modeled on fossil-fueled visions of excessive futurist mobility. As Gibson's narrator puts it, with an unmistakable reference to one of Raymond Loewy's most famous designs, even "pencil sharpeners looked as though they'd been put together in wind tunnels" (Gibson 2003, 26). As an industrial design movement, the Streamlined Moderne revisited by Gibson disassociated the experience of speed and energy from its material resources and environmental costs. Sublimated into aerodynamic surfaces of gleaming chrome, fossil fuel comes to permeate modern culture not as a sticky nonrenewable raw material and prime factor of global warming but as a purchasable idea and feeling of efficiency, hygiene, freedom, progress, and functionality. In this light, it is only consistent that Raymond Loewy, the founder of streamlined design, also designed the logos for Shell, Exxon, and BP. In the prominent Art Deco architecture in New York City, this connection to petroculture is no less apparent. It is no coincidence that two of the most iconic Manhattan skyscrapers of the 1920s—the American Radiator Building and the Chrysler Building—metonymically relate to the dominant fossil fuel commodities of the time. Built by the American Radiator Company, one of the leading manufacturers of domestic boilers advertised for their cleanliness in heating American homes, the Radiator Building visually and deliberately resembles stacks of coal topped by golden flames. Similarly, the steel tower of the Chrysler Building, commissioned by the third-largest American car manufacturer of the 1920s, is modeled on the chrome grills of the Chrysler automobile (see Nye 1996, 94). Fossil fuel relations are capital relations. As promethean advertisements for their owners, these buildings also function as monuments to the dream of an American future built on fossil fuels and stage energy consumption as a spectacle without the dirt.

In his exploration of the architectural American dreamscape, Gibson's protagonist is aware that these design efforts were "only skin-deep; under the streamlined chrome shell, you'd find the same Victorian mechanism. . . . It was all a stage set, a series of elaborate props for playing at living in the future" (Gibson 2003, 26). As in the case of the spectacular light designs of American cities and world fairs, the engine house is merely hidden, the depletion of resources and pollution of atmospheres repressed. Announced by its title, "The Gernsback Continuum" literalizes the permeation of American culture around 1930 by an

energy imaginary that is as much part of actual building design as it is of the science fiction pulp magazines that gained popularity after Hugo Gernsback's launching of *Amazing Stories* in 1926 (see Westfahl 2015). Sensitized to the "ephemeral stuff extruded by the collective American subconscious of the Thirties," the protagonist begins to find his reality punctured by manifest visions of futuristic cities, airships, and "whizzing chrome teardrops with shark fins" that seem to come straight out of the visual culture of Golden Age science fiction (Gibson 2003, 35). Rationalized as "semiotic phantoms, bits of deep cultural imagery that have split off and taken on a life of their own" (31), these scenes impinge on the narrative as specters of a skewed utopianism that sharply clashes with the diegetic present. With references to Fritz Lang's *Metropolis* (1927), William Menzies's *Things to Come* (1936), and the iconic pulp science fiction cover art of Frank R. Paul, Gibson portrays the modernist era as the hotbed of a glorified futurist aesthetic in which cultural diversity, resource scarcity, and waste has no place. In a key episode, the protagonist is on the road—as throughout most of the story, highlighting perhaps Gibson's own energy unconscious—and startled by the sight of a techno-utopian behemoth rising up behind his car:

> Spire stood on spire in gleaming ziggurat steps that climbed to a central golden temple tower ringed with the crazy radiator flanges of the Mongo gas stations. You could hide the Empire State Building in the smallest of those towers. Roads of crystal soared between the spires, crossed and recrossed by smooth silver shapes like beads of running mercury. The air was thick with ships: giant wing-liners, little darting silver things (sometimes one of the quicksilver shapes from the sky bridges rose gracefully into the air and flew up to join the dance), mile-long blimps, hovering dragonfly things that were gyrocopters. . . I closed my eyes and swung around in the seat. When I opened them, I willed myself to see the mileage meter, the pale road dust on the black plastic dashboard, the overflowing ashtray. (33; ellipsis in original)

Like a superlative version of 1930s Manhattan and a materialization of Umberto Boccioni's radical confidence in "the radiant splendour of our future" (2011, 75), this vision of the future metropolis derives its fantastic allure from the side-by-side of towering temples with radiator flanges and an atmosphere thick not with aerosols but with dancing airships whose modes of propulsion remain mysterious. It serves as an excellent example of why "sf is crucial, as both cipher and symptom, to the endeavour of decoding the energy unconscious," as Brent Bellamy insists (2019). Vis-à-vis the often covert energy imaginary of science fiction, Graeme Macdonald raises a set of questions that help readers confront the energy unconscious of the above scene: "What *is* powering those spaceships? What heats those megacities? How are its inputs extracted and

refined and commodities made and distributed?" (2016, n.p.). We could extend this list by inquiring into the ideological mechanisms and technological fixes that underlie the apparent disassociation of energy expenditure from climate and atmosphere. As if to inoculate himself against the irrationality of this energy regime, the protagonist forces himself to focus on the mileage meter, road dust, plastic, and spent cigarettes—material testimonies to energy exhaustion, waste, friction, and toxicity. Adorned with "searchlights [that] swept the sky for the sheer joy of it" and populated by toga-wearing Americans who "were white, blond, and. . . probably had blue eyes," the "illuminated city" presents itself as a direct descendent of Edison's electrified Manhattan, streamlined architecture, and Lang's *Metropolis* (Gibson 2003, 34)—whose mutual inflections are well documented (e.g., Mendlesohn 2009). At the same time, it speaks to the exclusionary American utopianism intrinsic to the well-worn trope of "the shining city on a hill," reiterated in Ronald Reagan's "Vision for America" address that inaugurated the 1980s.

Exhibiting "the sinister fruitiness of Hitler Youth Propaganda" and propelled by "a dream logic that knew nothing of pollution, the finite bounds of fossil fuels, or foreign wars it was possible to lose" (Gibson 2003, 34), this sanitized retrofuture reeks of eugenics, climate amnesia, and proto-fascism. In case this has not been obvious so far, Gibson's story offers a searing critique of the futurist imaginary that co-emerged with American modernism. His dismissal of American utopian thinking of the 1920s–1940s is programmatic for the ways in which cyberpunk writers stylized themselves in opposition to the authoritarian and naive rhetoric of stability, abundance, and techno-optimism of both Golden Age science fiction and the Reagan era. In his preface to the 1986 *Mirrorshades* collection, the inofficial cyberpunk manifesto, Bruce Sterling, certainly with an eye to Gibson, insists that "times have changed since the comfortable era of Hugo Gernsback, when Science was safely enshrined—and confined—in an ivory tower. The careless technophilia of those days belongs to a vanished, sluggish era" (1991, 346). Inaugurated perhaps by Edward Bellamy's influential 1887 vision of Boston in the year 2000, the utopian invisibility of energy in the early twentieth-century American imaginary relies on buildings of "colossal size and architectural grandeur" (2000, 25) distinguished by "the complete absence of chimneys and their smoke" (27) and symbolic of "material prosperity" without "the crude method of combustion" (28). By contrast, the urban climate of 1980s cyberpunk finds its emblematic articulation in a sky "the color of television, tuned to a dead channel," hailed in the opening line of Gibson's *Neuromancer* (1984, 1) and the oil weather of 2019 Los Angeles punctuated by the fiery flares of urban refineries in the title sequence of Ridley Scott's classic *Blade Runner* (1982). While, admittedly, energy expenditure and sustainability remain equally unproblematized in the data-driven world heralded by cyberpunks (see Bellamy, 2019), "The Gernsback Continuum" is legible as a critique of the tacit modern assumption that a future built on fossil fuels would bring "unlimited power"

to America (Adams 2015, 131)—a sentiment that, with varying degrees of enthusiasm and critical reflection, held sway in a cultural milieu that leads from Edward Bellamy to *Amazing Stories*, from Henry Adams and the fin de siècle expositions to the GM Futurama exhibit at the 1939 world's fair in New York. Its aesthetic regime is integral to what LeMenager calls "petrotopia," a "hegemonic 'spatial ordering'" of modernity around petroleum culture that "represents itself as an ideal end-state, the service economy made flesh, repressing the violence it has performed" on those displaced by the promises of comfort, efficiency, and speed (2014, 74–75). Exposing the physical constraints, ecological ramifications, and concealed violence in Golden Age visions of the future, Gibson's protagonist reinserts the material reality of fossil fuel power:

> The Thirties dreamed white marble and slip-stream chrome, immortal crystal and burnished bronze, but the rockets on the covers of the Gernsback pulps had fallen on London in the dead of night, screaming. After the war everyone had a car—no wings for it—and the promised superhighways to drive it down, so that the sky itself darkened, and the fumes ate the marble and pitted the miracle crystal. (Gibson 2003, 28)

The association of Blitzkrieg, superhighways, a darkened sky, and corrosive fumes reveals the repressed dimensions of petrotopia already latent in the Roaring Twenties. All that is solid does in fact not melt into air and become invisible but returns with a crash, lingers in the atmosphere, and leaves an ill-boding patina on the facades designed as a projection surface for dreams of progress and prosperity.

The Dissipating City

The passage from Don DeLillo's *White Noise* (1985) cited in the epigraph of this article invokes heat as the atmospheric-material substrate of modern city life. Underneath cultural metaphors of melting pots, the modern city is quite literally a site of metabolic exchange and of the dissipation of heat into a planetary system of atmospheric circulation: "Heat. This is what cities mean to me. . . . The heat of air, traffic, and people. The heat of food and sex. The heat of tall buildings. . . . The entire infrastructure is based on heat, desperately uses up heat, breeds more heat" (DeLillo 2002, 10). The potential energy stored in bodies, buildings, fuel, and food—not to speak of the heat capacity, thermal conductivity, and emissivity of urban construction materials and the reflection coefficients at work as thermal radiation hits a kaleidoscope of gleaming surfaces—eventually melts into the atmosphere and creates what meteorologists call urban heat islands to describe why "it's always fifteen degrees hotter in the cities" (DeLillo 2002, 10). As a harbinger of the proverbial "heat death of the universe," the degradation of energy into thermal noise and its metonymic relation to a "poisoned sky" is

part of an entropic process that, as sketched out above, functions as a physical analogy of the energy unconscious (DeLillo 2002, 10).

In this final part of my article, I turn to John Dos Passos's *Manhattan Transfer* as a literalization of how the American metropolis materializes heat transfer and thereby situates the physicality of climate—a category notorious for its statistical abstraction and nonlocality (see Morton 2013; Horn 2018). By bringing the entropic conditions of the atmosphere down to street level, Dos Passos, in fact, manages to impart a sense of the ways in which cultural activity, energy, and climate are enmeshed and materialize in local, embodied, and affective relations between modern subjects and city. In this sense, my reading links up with Andrew Kalaidjian's suggestion of an "immersive approach" "to the modernist novel—*as* place—. . . that is not primarily visual but proprioceptive in its understanding of the material influences that control and shape the world of the text" (20). Published in 1925, *Manhattan Transfer* partakes in the same cultural milieu as Gernsback's launch of *Amazing Stories* in 1926, Cook's lithograph *Lower Manhattan*, Lang's *Metropolis*, and, perhaps most programmatically, Upton Sinclair's 1927 novel *Oil!*, the first and oddly solitary example of the American oil novel (Ghosh 2017; Hitchcock 2010; LeMenager 2014).

In *Manhattan Transfer*, fossil fuels are omnipresent—not as an overt focal point but as a naturalized background that continuously conditions the characters' senses in the form of smells, noise, and pollutants. The city's atmosphere is saturated with "the smell of scorched grease and steam" (128), "dust that smelled of gasoline" (148), "noise and fume" (211), and "coal smoke" emitted by a "rumbling" L train (24). Characters grope through "a tangle of gritty sawedged brittle noise" (129) and breathe in "rumble and grind and painted phrases. . . staggering like a pillar of smoke above the April streets" (316). Ambivalently, "the sky above the cardboard buildings" is invoked as "a vault of beaten lead" (238) but also in almost pastoral registers as filled "with flaked motherofpearl clouds" (109) and "whitecotton steam" (251). To speak of the representation of climate in *Manhattan Transfer* means attending to "the complex question of the representability of the unrepresentable" in ways that are related to the novel's textual translation of noise, as excellently discussed by Philipp Schweighauser (2008, 51). By capturing "the radically altered soundscape of modernity," he notes, modernist writers such as Dos Passos "let its noise seep into the very formal organization of their texts in an attempt to preserve something of the nontextual phenomena they aim to represent" (51). I want to advance a similar argument with respect to *Manhattan Transfer*'s representation of climate. I suggest that both the setting and the textual format of the novel *metabolize* the climatological conditions of the modern metropolis.

In its abstraction and scale, the problem with the concept of "climate," as Horn explains, is that it has "cut the air off from any phenomenal perceptibility . . . and from the culturally and regionally diverse images, narratives, dreams, observations, and cultural practices that human beings have historically used to come to terms with climate" (2018, 16). In its visceral depiction of subjects

exposed to the infrastructural material flows of the city, *Manhattan Transfer* manages to reattach climate to human experience by localizing, embodying, even atomizing the atmospheric effects of petromodernity. The link between atmosphere, heat, and noise in this context is not tangential but programmatic. Not only is noise a direct function of the perceiving subject's physical exposure to an agitated environmental medium, but its definition following Claude Shannon's mathematical theory of information is equivalent with the definition of entropy in statistical thermodynamics and thus directly relates to the dissipation of energy, interference, and the randomized distribution of particles (see Clarke 2002; Schweighauser 2011). The noise of urbanity signifies heat, friction, perturbation, and diffusion while also raising the image of the city as a complex physical communication system characterized by flow, blockage, spillage, and contamination (see Marshall 2010). Quite appropriately, Iain Colley subsumes the aesthetics *Manhattan Transfer* under the concept of "Brownian Motion," "the irregular jostling of small particles suspended in a gas or liquid, full of backtrackings and collisions, seemingly random but obeying the physical rules of matter" (1978, 49). This logic pertains as much to the contingent encounters and erratic trajectories of the novel's characters as to the turbulent suffusions of the physical urban atmosphere.

Through the metonymic relation between noise and the atmospheric circulation of particulates, Dos Passos presents the city as a space of intense vitality and energy consumption: the streets are "noisy as a brass band, full of tambourine rattle, brassy shine, crystal glitter, honk and whir of motors" (Dos Passos 2000, 273). Routinely, noise is correlated with the material traces of physical exhaustion: "the grind of the wheels of producewagons made a deafening clatter and filled the air with sharp dust" (29); "icy dust, of grinding rattle of wheels and scrape of hoofs on the cobblestones" (53). Beneath gleaming towers and "the glow over the city that stands up incredibly into the night sky" (199), life in Manhattan around 1920 is gritty business: "roaring. . . trucks and delivery wagons" leave a "taste of dust in [Ellen's] mouth, particles of grit crunch[ed] between her teeth" (219); a "dusteddy swirling scraps of paper along the gutter fills her mouth with grit" (238). While the city's collective contribution to atmospheric emissions is metaphorically displaced as a radiant glow, modernity's energy entanglements are visceralized in the invasion of streets and bodies by the exhausted materiality of grit and dust.

In contrast to the sanitized visions of modernity embodied by illuminated skylines and streamlined design, scenes like these highlight what architecture scholar David Gissen calls "subnature," or "architecture's other environments," whose expression include dankness, smoke, gas, exhaust, dust, puddles, mud, debris, weeds, insects, pigeons, and crowds (2009, 17). According to Gissen, modernist American architecture more or less successfully negotiates these other environments, sometimes through expulsion, at other times by courting and deliberately integrating or aestheticizing them. In either case, modern city design is itself constitutive of what it seeks to repress. In the case of dust, this is

perhaps most obvious. "Dust is the result of natural decay in buildings, pollution from cars and factories, and the result of landscapes transformed by disasters . . . dust is always pervasive; though infinitesimal, it is never not there" (Gissen 2009, 88). In *Manhattan Transfer*, life is everywhere mediated by this transgressive and pervasive presence of the city as particularized subnature, to the point where Jimmy Herf, in a delirious episode, imagines shrinking "until he was of the smallness of dust, picking his way over crags and boulders in the roaring gutter, climbing straws, skirting motoroil lakes" (Dos Passos 2000, 317). Literalized here, the citizen of the modern metropolis merges with its material unconscious.

Highlighting the presence of spillage and waste, the close-up on the roaring gutter and motor-oil lakes illustrates what Kate Marshall in her persuasive reading of the novel describes as "the becoming-visible of infrastructure in this particular moment in American literary history" (2010, 56). According to her, *Manhattan Transfer* portrays a "landscape in which stopped pipes, traffic, congested ventilation and jammed signals reveal the complex, communicative relays systemically connecting persons and spaces that would otherwise work undetected" (Marshall 2010, 56). As when "women begin to drain gradually out of the tall buildings downtown, grayfaced throngs flood subways and tubes, vanish underground" (Dos Passos 2000, 276), the circulation of people through architecture is allegorized in terms of the drainage of pipes and the disappearance into concealed subterranean infrastructures, not unlike the banishment of waste from consciousness via underground sewage systems or hidden chimneys. Yet, rather than leaving these structures concealed, Dos Passos continuously draws attention to their presence. In what reads like an archetypal depiction of the return of the architecturally (and socially) repressed, Ellen "under all the nickelplated, goldplated streets enameled with May. . . could feel the huddling smell, spreading in dark slow crouching masses like corruption oozing from broken sewers, like a mob" (352). The metaphorical linkage between mobs and spreading ooze from broken sewers attests to the entanglements among congested streets, pipes, and atmospheres as the other environments of nickel- and gold-plated architecture.

By ceaselessly invoking these subnatural and infrastructural sites, Dos Passos foregrounds what I would like to call the climate unconscious of the modern metropolis: the taken-for-granted, quotidian, and experiential sites of energy dissipation and the production and circulation of (polluted) atmospheres below the abstracted scale of a global climate system. In its emphasis on the aesthetics of grit, noise, dust, ooze, and fumes, the novel invokes "the material reality that underwrites the totality," an aspect introduced by the editors of *Petrocultures* as integral to reckoning with the "infrastructural unconscious" of "petroscape aesthetics." As they explain, vis-á-vis the global entanglements of energy "there's no singular subject who can know the whole. . . . There are only fragments of experience, expertise, action, and thoughts to be apprehended and assembled in new and revolutionary ways" (Wilson et al. 2017, 410). Correspondingly, I suggest that the textual fragmentation of perspectives and the

narrative polyvocality of *Manhattan Transfer*—mirrored in the characters' futile search for "the center of things" (Dos Passos 2000, 16)—help us understand climate not as a totality but as an affective and situated condition and as the product of specific petromodern emplacements in relation to city life. In other words, the *novel* localizes climate not with respect to a sense of planet but in the sensorial reality of a specific place within the urban chaos of modernity, however subjective, infinitesimal, or transitional that place may be.

In visual registers analogous to cubist and futurist artworks, the characters' perception of the city is conditioned by the petro-aesthetic experience of speed and transience: "a confusion of bright intersecting planes of color, faces, legs, shop windows, trolleycars, automobiles" (Dos Passos 2000, 300). As in Umberto Boccioni's 1912 painting *The Street Enters the House*, the realms of outside and inside in the novel repeatedly intermingle, suggesting that the human relation to atmospheres always already implies both envelopment and permeation. Melting, creeping, and squirming through the porosities of bodies and buildings, noise, like the pollutants of the engines that produce it, invades apartments as "black spiraling roar outside. . . melting through the walls" (50), "rattling sounds of cabs and trolleycars squirm[ing] brokenly through the closed windows" (81), or "the horrible great dark of grownup people, rumbling, jiggling, creeping in chunks through the windows, putting fingers through the crack in the door" (333). Ultimately, the title *Manhattan Transfer* thus denotes not only the switch from steam to electricity as the signifier of a New Jersey transfer station (see Marshall 2010) or the city metabolism of people and traffic but also the circulation of its atmosphere: the physical transfer of heat and pollutants as a direct consequence of the dissipation of energy.

As a negotiation of the 1920s metropolis suffused by energy, *Manhattan Transfer* is much more ambivalent than cotemporaneous visions of the futuristic city in architecture, painting, or science fiction. Rather than metaphorically displace modernity's energy entanglements, it confronts the material and mundane reality of dissipation and resource consumption by highlighting the sites where urban life and climate are enmeshed and embodied. Tellingly, it is only Jimmy's view from a distance that allows for a simultaneous reckoning with the full scope of the city's energy expenditure and its aestheticization as a utopian dreamscape. Reentering the city by ship on their return from a trip to Europe, Jimmy and Ellen soak in the scenery of "sweeping coils of brown smoke and blobs of whitecotton steam" and a "sootsmudged horizon, tangled with barges, steamers, chimneys of powerplants" against which "lower New York was a pink and white tapering pyramid cut slenderly out of cardboard," prompting Jimmy to exclaim, "it's the greatest sight in the world" (Dos Passos 2000, 251). As in Howard Cook's image of lower Manhattan, atmospheric pollution is naturalized and swiftly absorbed into the aesthetics of an energized spectacle. Yet, decisively, this glorified image of the city is immediately coded as unreal—made of cardboard—and in the context of the novel remains an aberration, a brief glimpse at the dream logic at work in the modernist imaginary. Much more realistic is Jimmy's final impres-

sion as he eventually leaves New York in the novel's concluding scene. As he traverses the city's industrial outskirts, he walks "along a cement road between dumping grounds full of smoking rubbishpiles" (360)—reminiscent perhaps of the "valley of ashes" on the periphery of Manhattan invoked in *The Great Gatsby* (1925)—and has breakfast across from "a gasoline station" (360), the first and only one featured in the novel. The climate unconscious of the modernist metropolis as the apotheosis of petromodernity reveals itself in the symbolic gap between gas station and smoking rubbish, between the fantasy of an inexhaustible, sanitized supply of fossil fuels and its aesthetic (and cognitive) disassociation from the toxicity of energy waste products and the pervasive release of hydrocarbons into air and soil.

Conclusion

The climatic un/conscious of the urban American imaginary at the center of this article articulates itself in the wake of 1920, a year that marked the first time in which more Americans lived in cities than in rural areas and in which the growing oil demand of automobile, building, and shipping industries exceeded the national supply, sparking perhaps the earliest anxieties about peak oil (Nordhauser 1973, U.S. Census Bureau 2021). Climate and weather in this era are not absent from cultural representation but dislocated. They are pushed to an unacknowledged outside in the sanitized cities of Golden Age science fiction and atomized in the modernist imagination of urban atmospheres. The process of cultural sublimation at work in the evaporating solids and psychoclimatic displacement of the 1920s shares not only an etymological root but also a history with the sublime. By 1930, the aesthetic sensibilities of American landscape artists had fully transitioned from the meteorological sublime of the Hudson River School to what a 2013 Exhibition on modernist art at the Hudson River Museum calls "the industrial sublime" (cf. Jensen and Bland 2014). Attention to weather and stormy atmospheres had been eclipsed by a celebration of industry; turbulent cloudscapes had been replaced with whitewashed fumes and energy infrastructure. Yet the physicality of climate is everywhere found in the ways that thermal energy is circulated, conducted, radiated, converted, and absorbed. The literary texts discussed above point to similar mechanisms by which climate becomes unconscious. The petrotopian imaginary recapitulated by Gibson relies on a fetishization of order and control. It raises the specter of an idealized place cordoned off from the entropic processes of both the atmospheric and the machinic modes of heat transfer that sustain it. *Manhattan Transfer*, by contrast, amplifies sites of atmospheric chaos and abrogates any sense of control or ontological detachment. Jimmy Herf finds himself always already at the center of things. He has entered the steam engine. Too immersed to reckon with atmosphere or climate as phenomenally distinct from the material flows of the city and even himself, he becomes the prototypical subject of a climate realism that "calls for us to consider that what it means to be a human observer is to already veer toward and with an altered sense of meaning-making,

detailing, and also weirding the coherence of the world" (Badia et al. 2021, 6).

Michel Serres makes an analogous point in his reading of Robert Musil's *Man without Qualities* (1931), a modernist city novel that programmatically opens with a narrative map of atmospheric pressure gradients over the Atlantic (cf. Serres 1978, 1982). As Serres writes, "Musil. . . goes inside of the boiler. His machinery is aleatory" (1978, 16). If we can recover climate from *Manhattan Transfer*, it is perhaps in the same way that Serres reads contingent encounters, partial observers, and turbulence in Musil: as the constitution of a space "where the local is inserted within the global" (10). Let me propose that in Dos Passos, as in Musil, the city as boiler and atmosphere is described locally, no longer in terms of its construction or its general dynamics but rather in terms of the numerous and turbulent complicated events that take place in the heart of it, inside the reservoir. This is the era of Boltzmann and Gibbs. What goes on then in the liquid? The answer is in the text: collisions, slides, irregularities, changes, dissonances, disorder, pulsations, rhythm, order (Serres 1978, 16).

Manhattan heat transfer: splicing the word "heat" into the title of one of the most iconic modernist city novels indicates that the unacknowledged transfer of thermal energy—the circulation and collision of particles in motion and a key parameter in the shaping of climate—needs to be understood as the primary force and symbol of a modernity conditioned by the combustion of fossil fuels. Against the backdrop of the intense energy expenditure of the 1920s and the conspicuous obfuscation of climate entanglements in representations of the modern metropolis, it stands as a telling fact of U.S. environmental history that the American meteorologist J. B. Kincer presented the first scientific evidence of global warming in 1933 (Kincer 1933), the same year that saw the first of several severe dust storms ravage the plains of South Dakota, inaugurating the decade of the Dust Bowl—perhaps the twentieth century's most devastating reminder that American industry and atmosphere are inextricably interlinked.

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Works Cited

Adams, Henry. *The Education of Henry Adams*. Charles Town, WV: Jefferson Publishing, 2015.

Anderson, Darran. *Imaginary Cities: A Tour of Dream Cities, Nightmare Cities, and Everywhere in Between*. Chicago: University of Chicago Press, 2015.

Badia, Lynn, Cetinić, Marija, and Diamanti, Jeff. "Introduction." In *Climate Realism: The Aesthetics of Weather and Atmosphere in the Anthropocene*, edited

by Lynn Badia, Marija Cetinić, and Jeff Diamanti, 1–16. London: Routledge, 2021.

Bellamy, Brent Ryan. "Neuromancer: The Cultural Logic of Late Fossil Capital?" *Open Library of Humanities* 5, no. 1 (2019). https://doi.org/10.16995/olh.150.

Bellamy, Edward. *Looking Backward: 2000–1887*. New York: Signet, 2000.

Berman, Marshall. *All That Is Solid Melts into Air: The Experience of Modernity*. New York: Viking Penguin, 1988.

Boccioni, Humberto. "To the Young Artists of Italy!" In *100 Artists' Manifestos: From the Futurists to the Stuckists*, edited by Alex Danchev, 74–79. London: Penguin, 2011.

Bonneuil, Christophe, and Fressoz, Jean-Baptiste. *The Shock of the Anthropocene: The Earth, History and Us*, translated by David Fernbach. London: Verso, 2017.

Chwałczyk, Franciszek. "Around the Anthropocene in Eighty Names: Considering the Urbanocene Proposition." *Sustainability* 12, no. 11 (2020). https://doi.org/10.3390/su12114458.

Clarke, Bruce. "From Thermodynamics to Virtuality." In *From Energy to Information: Representation in Science and Technology, Art, and Literature*, edited by Bruce Clarke and Linda Dalrymple-Henderson, 17–34. Stanford, CA: Stanford University Press, 2002.

Colley, Iain. *Dos Passos and the Fiction of Despair*. London: Macmillan, 1978.

Crutzen, Paul J., and Steffen, Will. "How Long Have We Been in the Anthropocene Era?" *Climatic Change* 61 (2003): 251–57.

Daggett, Cara New. *The Birth of Energy: Fossil Fuels, Thermodynamics, and the Politics of Work*. Durham, NC: Duke University Press, 2019.

DeLillo, Don. *White Noise*. London: Picador, 2002.

Dos Passos, John. *Manhattan Transfer*. London: Penguin Books, 2000. Original work published 1925.

Douglas, Mary. *Purity and Danger: An Analysis of Concepts of Pollution and Taboo*. London: Routledge, 1966.

Foote, Eunice. "Circumstances Affecting the Heat of the Sun's Rays." *American Journal of Science and Arts* 22 (1856): 382–83.

Ghosh, Amitav. "Petrofiction: The Oil Encounter and the Novel." In *Energy Humanities: An Anthology*, edited by Imre Szeman and Dominic Boyer, 431–39. Baltimore: Johns Hopkins University Press, 2017.

Gibson, William. *Neuromancer*. New York: Ace Books, 1984.

———. "The Gernsback Continuum." In *Burning Chrome*, 24–36. New York: HarperCollins, 2003. Original work published 1982.

Gissen, David. *Subnature: Architecture's Other Environments: Atmospheres, Matter, Life*. New York: Princeton Architectural Press, 2009.

Hitchcock, Peter. "Oil in an American Imaginary." *New Formations* 69 (2010): 81–97.

Horn, Eva. "Air as Medium." *Grey Room* 73 (2018): 6–25.

Jensen, Kirsten M. and Bartholomew, F. Bland, eds. *Industrial Sublime: Modernism and the Transformation of New York's Rivers, 1900–1940*. New York: Fordham University Press, 2014.

Kalaidjian, Andrew. *Exhausted Ecologies: Modernism and Environmental Recovery*. Cambridge: Cambridge University Press, 2020.

Kincer, J. B. "Is Our Climate Changing: A Study of Long-Time Temperature Trends." *Monthly Weather Review* 61, no. 9 (1933): 251–59.

Kinder, Jordan B., and Szeman, Imre. "Literature and Energy." In *The Palgrave Handbook of Twentieth and Twenty-First Century Literature and Science*, edited by Neel Ahuja, Monique Allewaert, Lindsey Andrews, Gerry Canavan, and Rebecca Evans, 79–96. Cham: Palgrave Macmillan, 2020.

LeMenager, Stephanie. *Living Oil: Petroleum Culture in the American Century*. New York: Oxford University Press, 2014.

Macdonald, Graeme. "Improbability Drives: The Energy of SF." *Strange Horizons*. February 15, 2016. http://strangehorizons.com/non-fiction/articles/improbability-drives-the-energy-of-sf.

Malm, Andreas. *Fossil Capital: The Rise of Steam-Power and the Roots of Global Warming*. London: Verso, 2016.

Marinetti, F. T. "The Futurist Manifesto." In *100 Artists' Manifestos: From the Futurists to the Stuckists*, edited by Alex Danchev, 63–70. London: Penguin, 2011.

Marshall, Kate. "Sewer, Furnace, Air Shaft, Media: Modernity behind the Walls in *Native Son* and *Manhattan Transfer*." *Studies in American Fiction* 37, no. 1 (2010): 55–80.

Marx, Karl. "Speech at the Anniversary of the *People's Paper.*" Vol. 1 of *Karl Marx and Friedrich Engels: Selected Works*, 500–501. Moscow: Progress Publishers, 1969. Original work published 1856.

Mendlesohn, Farah. "Fiction, 1926–1949." In *The Routledge Companion to Science Fiction*, edited by Mark Bould, Andrew M. Butler, Adam Roberts, and Sherryl Vint, 52–61. London: Routledge, 2009.

Morton, Timothy. *Hyperobjects: Philosophy and Ecology after the End of the World*. Minneapolis: University of Minnesota Press, 2013.

Nordhauser, Norman. "Origins of Federal Oil Regulation in the 1920's." *Business History Review* 47, no.1 (1973): 53–71.

Nye, David E. *American Technological Sublime*. Cambridge, MA: MIT Press, 1996.

———. *American Illuminations: Urban Lighting, 1800–1920*. Cambridge, MA: MIT Press, 2018.

Rubenstein, Michael, and Neuman, Justin. *Modernism and Its Environments*. London: Bloomsbury Academic, 2020.

Schuster, Joshua. *The Ecology of Modernism*: *American Environments and Avant-Garde Poetics*. Tuscaloosa: University of Alabama Press, 2015.

———. "Where Is the Oil in Modernism?" In *Petrocultures: Oil, Politics, Culture*, edited by Sheena Wilson, Adam Carlson, and Imre Szeman, 197–213. Montreal: McGill-Queen's University Press, 2017.

Schweighauser, Philipp. "The Noises of Modernist Form: Dos Passos, Hurston, and the Soundscapes of Modernity." In *American Studies as Media Studies*, edited by Frank Kelleter and Daniel Stein, 47–55. Heidelberg: Winter, 2008.

Schweighauser, Philipp. "Information Theory." In *Routledge Companion to Literature and Science*, edited by Bruce Clarke and Manuela Rossini, 145–56. London: Routledge, 2011.

Serres, Michel. "Exact and Human." *SubStance* 6/7, no. 21 (1978): 9–19.

———. "Turner Translates Carnot." In *Hermes: Literature, Science, Philosophy*, edited by Josué V. Harari and David F. Bell, 54-70. Baltimore: Johns Hopkins University Press, 1982.

Sterling, Bruce. "Preface from Mirrorshades." In *Storming the Reality Studio: A Casebook of Cyberpunk and Postmodern Science Fiction*, edited by Larry McCaffery, 343–48. Durham, NC: Duke University Press, 1991.

Szeman, Imre, and Boyer, Dominic. "Introduction: On the Energy Humanities." In *Energy Humanities: An Anthology*, edited by Imre Szeman and Dominic Boyer, 1–14. Baltimore: Johns Hopkins University Press, 2017.

US Census Bureau. "Urban and Rural Areas." August 29, 2021. https://www.census.gov/history/www/programs/geography/urban_and_rural_areas.html.

US Energy Information Administration. "History of Energy Consumption in the United States, 1775–2009." February 9, 2011. https://www.eia.gov/todayinenergy/detail.php?id=10.

Westfahl, Gary. "The Mightiest Machine: The Development of American Science Fiction from the 1920s to the 1960s." In *The Cambridge Companion to American Science Fiction*, edited by Eric Carl Link and Gerry Canavan, 17–30. Cambridge: Cambridge University Press, 2015.

Wilson, Sheena, Szeman, Imre, and Carlson, Adam. "Petroscape Aesthetics." In *Petrocultures: Oil, Politics, Culture*, edited by Sheena Wilson, Adam Carlson, and Imre Szeman, 407–10. Montreal: McGill-Queen's University Press, 2017.

Yaeger, Patricia. 2017. "Literature in the Ages of Wood." In *Energy Humanities: An Anthology*, edited by Imre Szeman and Dominic Boyer, 440–44. Baltimore: Johns Hopkins University Press, 2017.