[tl;dr: The idea at the center of the proto-Anthropocene that ALN picks up is of a collective human mind struggling with and ultimately triumphing over a brutish nature, to improve it into a more rational version of itself. It thus in some ways represents contemporary discourses of sustainability, the good Anthropocene, etc.; but it also tends to be more critical than the contemporaneous proto-Anthropocene theories, emphasizing conservation and the destructiveness of humanity in ways that resemble our current Anthropocene theories to a greater degree even than LeConte et al.] 🡨 woop woop this is the unified environmental ethos I’m talkin ‘bout 🡨 and another thing! Anthropoceners in the humanities usually go all the way back to Buffon or Lyell. Anthropocene isn’t just geology! And obviously the Holocene is important, but there are closer anticipations!

Human/Nature: American Literary Naturalism and the Anthropocene

At some point in 1893, not long before Frederick Jackson Turner rang the death knell of the American frontier, Frank Norris learned of what we now call the Anthropocene.

In a Berkeley lecture hall—probably among the wood panels of South Hall, then home to the geology department, and probably fidgeting, if tales of his dubious scholarship are to be believed—he would have sat listening to his favorite professor Joseph LeConte elaborate his theory of a human-centered unit of geologic time. He might also have been following along in one of the two consecutive geology textbooks, *Elements of Geology* (1877) and *A Compend of Geology* (1884), that “Uncle Joe” (as his students called him) released and re-released in the years leading up to Norris’s course (Lester, [citation from chapter 2]). In either case, he would have found an account of geologic time capped with an “age of man,” defined by the “reign of mind” in place of the brute ferocity that had reigned till then (LeConte *Elements* 586): the “Psychozoic Era,” one of the many popular theories of the era that sought to define humanity’s place in geologic time and as a pervasive natural force, in this case a schema in which the mind becomes an ethereal stratum governing the sedimentary material that is the more traditional subject of stratigraphy.

Almost 125 years later, many of the same concerns echo in the figure of the Anthropocene: also a proposal for a geological epoch defined by human activity, but now more broadly accepted, with harder stratigraphic evidence supporting its adoption, and with a new sense of urgency deriving from a warming climate and the potentially existential threat to human life on earth that comes with it. Debates from the earth sciences to the humanities have proliferated, but adherents of the Anthropocene theory agree that the pervasive influence of *Homo sapiens* became the primary force influencing the overlapping systems of the Earth sometime between the end of the Pleistocene and the 20th century’s “Great Acceleration,” which saw an exponential increase in population and accompanying increases of everything from land use to anthropogenic atmospheric change. Meanwhile, a century earlier, LeConte:

The Quaternary, and, indeed, all previous ages, were reigns of *brute force* and *animal ferocity*. A condition of things prevailed which was inconsistent with the supremacy of man. The age of man, on the contrary, is characterized by the *reign of mind*. Therefore, as was necessary, the dangerous animals decreased in size and number, and the useful animals and plants were introduced, or else preserved by man. (LeConte *Elements* 586)

Although in length of time this is not to be compared to an era, nor to an age, nor to a period, nor even to an epoch, yet it deserves to be made one of the primary divisions of time, not only on account of the dignity of man, but also, and mainly, because through his agency there is now going on in organic forms a change as sweeping as any which has ever taken place. This change has been going on ever since the introduction of man, and is going on now, but will not be complete until civilized man occupies the whole earth. (LeConte *Compend* 381)

LeConte’s theory reaches even further than the contemporary theory of the Anthropocene: where the latter is a mere epoch, the former announces an era. And unlike most formulations of the Anthropocene, LeConte proposes his Psychozoic Era with an apparent sense of approval, contrasting the orderliness of human-controlled spaces with the “*brute force* and *animal ferocity*” that reigns when nature is allowed to take its own course. Nevertheless, it anticipates the Anthropocene in its recognition that humanity’s impact on the life systems of the planet has expanded to a scale unaccountable except in geologic terms, that despite the temporal insignificance of humanity in comparison to eras and even epochs, the potency of the human force is as great as any that has come before it or coexists with it. And in much the same way that the Anthropocene has caused a historiographic, scientific, and literary upheaval since its first (modern) formal proposal in 2000, the Psychozoic and theories like it would have upset the deterministic logic that defined many post-Darwinian understandings of the human-nature relationship at the time—the very logic usually ascribed to Norris’s favored genre, American literary naturalism.

Six years or so after studying with LeConte, Norris would publish the masterpiece of American literary naturalism, *The Octopus*. His novel is hardly a vehicle for LeConte’s theory of nature or any other—though, as I will show, it most nearly anticipates Jason W. Moore’s theory of the “Capitalocene”—but it is clear that LeConte’s well documented influence on Norris’s fiction includes the theory of the Psychozoic Era. Beneath the human dramas of freight rates, predatory landlords, and sputtering revolutions is the drama of the human supplanting the natural: the brutal intercourse of a mechanized and unified humanity with the “panting” Mother Earth conceives the monster of the Wheat, a resistless cyborg that sweeps over the planet, a force as human as it is nature, and one that leaves only exhausted stubble in its wake (#). Where many critics have seen a romance of human nature, there is also a tragedy of human/nature.

What is true of Norris is true of many of naturalism’s major authors. Jack London’s late agricultural novels attend to the impoverishment of the soil by industrialized farming practices, framing this development not as a temporary or incidental occurrence but as the expression of an inborn species trait. His “Anthropos,” which he problematically gives the visage of “Anglo-Saxon” whiteness, is thus defined by pervasive environmental despoliation and ruinous population growth, a process that his essays and a play extend to the scale of the planet. London’s papers are filled with clippings on sustainable farming practices and projections of planet-wide despoliation from various scientific, journalistic, and government publications, a scientific and agricultural background to his own extrapolative imagination; and though not influenced to the same extent as Norris, London was at least aware of LeConte to a great enough extent to mention him by name in *Martin Eden* (#). Charlotte Perkins Gilman depicted a world-in-miniature in *Herland*, in which the all-female human residents assumed absolute control over the organization, composition, and interactions of non-human and human life. Humanity’s ubiquitous influence on the planet in this schema has the potential to be pernicious and lead to ruination, as is generally implied by invocations of the Anthropocene today; but it is not the case in *Herland* because they have grown into a wiser and more knowledgeable species. Again the human species is the measure of environmental possibilities and futures, an association that ultimately links Gilman’s environmental thinking with her troubling support of eugenics. In the background of this dubious environmental ethos is Lester F. Ward, best known now as the father of modern sociology but then an influential biologist and paleobotanist who likewise linked the future evolution of humanity with planetary environmental transformation.

In contrast to these universalizing—and generally (if differently) racist—accounts of human/nature, Charles W. Chesnutt understands that the universal “human” conjured by the notion of a human-centered geological epoch is more accurately a composite of vastly different naturecultures (to borrow a phrase from Haraway), which exist regionally and defy expected stratifications of race, class, and social status; and yet the emergence of regional difference is threatened by the homogenizing force of plantation capitalism, a social and ecological monoculture that creates profit out of universalization. Despite his interest in Darwinian evolutionary theory, Chesnutt has not been widely read as a naturalist until recently, with some scholars placing him at the center of a growing conception of “black naturalism” that recognizes the hand of the (usually white, usually rich) human in the supposedly “natural” conditions determining the fortunes of the poor and especially people of color. Understanding his depiction of this co-determinative, multifaceted relationship to nature—and crucially, the ways that relationship was being negotiated and renegotiated across different communities and environments—helps place Chesnutt in the context of a newly nature-focused conception of naturalism.

The purpose of this dissertation is to develop such a conception of naturalism’s environmental thinking by placing it in the global scientific context of what I will call “proto-Anthropocene” theories: a cluster of related conceptions of the human-nature relationship that figure humanity per seas a newly powerful geologic force determining the shape of the entire non-human environment, beginning with George Perkins Marsh’s *Man and Nature* in 1864 and capped by Vladimir Vernadsky, Pierre Tielhard de Chardin, and Edouárd LeRoy’s theory of the Noösphere in 1923. The naturalist conception of humanity’s impact on nature is best understood in the context of these theories, but that is not to say that the response was univocal. The authors discussed in the following chapters are unified not by a single answer, but a shared set of questions, deriving from a common recognition of the scale of humanity’s determinative influence on the planetary environment. The diversity of their responses anticipates the same diversity of responses to the Anthropocene in the 21st century, with differing representations of both the causes—humanness per se versus capitalism, for example—and the nature of the effects: whether humanity’s geological status is an apotheosis to be celebrated or a ruinous trend run out of control. The proto-Anthropocene thinkers to whom their responses are most indebted include figures whose influence is generally acknowledged in naturalist criticism but is read in different terms: Joseph Le Conte, discussed above; Lester F. Ward, an important early sociologist; [and Herbert Spencer?]. Especially where sustainable agriculture is involved, the authors discussed below also engage with the nascent conservation movement and the maturing science of ecology.

**Naturalism and Human/Nature: Redefining a Genre**

There is a potential problem with this understanding of naturalism, one that will not have escaped those versed in the ongoing critical conversation around literary naturalism: to say that this genre is partially defined by its attention to the pervasive impacts of human activity on non-human nature is to assert the exact inverse of the human-nature relationship normally ascribed to it. Naturalist determinism is usually represented as a unidirectional determination of human nature and consciousness by environmental conditions, tracing the losing struggle of internal forces against external ones that leads to a “plot of decline” as protagonists degenerate into primitive immorality or atavistic bestiality.[[1]](#footnote-1) The Anthropocene and proto-Anthropocene alike propose that such a relationship, to the extent that it ever existed, has been reversed, and that the human is now the overriding environmental force determining all others. If naturalists admit such a high degree of determinative human influence on nature, the terms of the naturalist conversation are not yet expansive enough to account for it.

In fact, the terms of the naturalist conversation as they have been traditionally constituted are hardly capable of describing any engagement with non-human nature whatsoever, leading to a common conception—as I will argue, *mis*conception—of the genre as primarily urban and only concerned with biology insofar as it explains human social dynamics. Naturalism has often been taken as a lesser cousin of realism, beginning with V. L. Parrington’s enduring designation of the genre as merely “pessimistic realism” in []. This sense of pessimism has often been directly connected to a definition of the genre by the philosophy of determinism mentioned briefly above: the naturalist character is not an agentive consciousness so much as a nexus for warring, external forces. Charles Walcutt, in *American Literary Naturalism: A Divided Stream* (1956),would argue that Parrington only told half the story, and that the philosophy of pessimistic determinism was counterposed by an equally powerful belief in political and social progress. A decade later, Donald Pizer, an institution of realist and naturalist criticism in his own right, would refuse to define the genre according to any “philosophical coherence” in either a pessimistic or optimistic direction, opting instead for a coherence based on “material and method,” and often the conflict between the two (qtd. in Newlin 4). Even through the eighties and nineties, despite a booming critical trade in theories of naturalism, non-human nature as an object of study is nowhere to be found.

There is room for objection to my characterization of the naturalist conversation: after all, it is a commonplace of naturalist criticism to assert that the genre is defined by an exploration the changing relationship between humanity and nature in the post-Darwinian moment of scientific rationality: as Jennifer Fleissner’s puts it in *Women, Compulsion, Modernity* (to pick just one influential example), “the changing status of ‘nature’ in human life” (cf. Fleissner #, OUP handbooks sources). But this statement and the “redefinition” it promises are generally followed studies primarily of *human* nature as it is depicted in naturalism, with non-human nature being left by the wayside. In a recent collection surveying the state of naturalist criticism, *The Oxford Handbook of American Literary Naturalism* (2011), Eric Carl Link frames naturalists as those authors “who engage, at the thematic level, post-Darwinian reconsiderations of the relationship between humans and nature,” but this ultimately entails a naturalized sense of social laws, atavism, and degeneration, all on an essentially human level (#). In the same volume, Bert Bender begins his discussion of “nature in naturalism” by equating the “idea of studying the human’s place in nature” in naturalism’s scientific context with “study[ing] human nature as a branch of Darwinian natural history” (53). Innumerable other studies frame the discussion in much the same way, and in many senses, they are right to: it would be preposterous to suggest that human nature and a post-Darwinian sense of the human do not play a constitutive role in defining naturalism. At the same time, this unremitting focus on nature-in-humanity, in the form of a kind of primitivism or animality, has largely eclipsed the question of humanity-in-nature,[[2]](#footnote-2) which in the era between industrialization and the Great Acceleration was shifting rapidly and portentously to become the planetary force it is today.

More recent scholarship has begun attending to depictions of non-human nature in naturalist novels, perhaps the beginnings of an ecocritical shift in naturalism studies—and this new moment of naturalist criticism often troubles or at least complicates our understanding of the genre’s supposed unidirectional determinism. Cara Elana Erdheim, pointing out Theodore Dreiser’s interest in and intellectual debt to Ernst Haeckel (coiner of the term “ecology”), devotes an article to “[l]ocating…ecological systems within the industrial landscapes” of Dreiser’s *An American Tragedy* and several other short pieces, uncovering a commitment to the preservation of waterways and his depiction of wealth as a matter of appropriating and transforming natural space (9). Recognizing the place of non-human nature in Dreiser’s work leads her to reconsider the “dualistic determinisms” traditionally ascribed to literary naturalism.[[3]](#footnote-3) Reading *The Octopus* and *The Grapes of Wrath*, Florian Freitag has argued persuasively that the defining environment of the naturalist novel may not be the city at all, but rather, the farm. He connects the major definitions of the naturalist novel to the tendencies of the farm novel: V. L. Parrington’s definition of naturalism as “pessimistic realism” to attempts by Hamlin Garland and others to burst the idyllic picture of rural life; the definition of naturalism as a deterministic genre defined by repetitions (cf. Mitchell) to the repetitions of natural agricultural cycles; and Donald Pizer’s naturalist sub-genre of the “group defeat” story, in which social movements are thwarted by corporations and institutions run out of control, to the financial traps of incentivization and foreclosure that appear again and again in the farm novel. Paul Formisano has read *Herland* and *The Octopus* in terms of a broader context of transformations in California’s ecology around the turn of the twentieth century, in the former case attending to Gilman’s reorganization of natural environments as a form of “land eugenics” and in the latter placing Frank Norris’s depiction of wheat distribution and production in the context of the imperial history of the American West. Attending to one of the most widely discussed wings of recent ecocriticism, Kevin Trumpeter finds a natural affinity between naturalist determinism’s deemphasis of unbounded human agency and the New Materialism’s attempt to extend agency beyond the human and even to inanimate matter.

The Anthropocene has remained largely absent from this conversation until now, however. One explanation is the apparent anachronism of taking a concept coined in the twenty-first century to understand a geological epoch likely to begin in the middle of the twentieth century to read a genre usually understood to be at its height between 1890 and 1915. Anthropocene studies of the Romantic and Victorian eras have proceeded by taking a longer view of the Anthropocene than the one prescribed by Anthropocene Working Group in the International Union of the Geological Sciences, and relating their texts to major figures in nineteenth-century geology such as Charles Lyell.[[4]](#footnote-4) The former move is justified by the strict standards of stratigraphic evidence required to assert a new epoch geologically—the so-called “golden spike” in the geological record, a clear footprint caused by human activity—and the range of possible alternative start-points for the Anthropocene that might be more historically descriptive, ranging as far back as the industrial revolution or even the invention of agriculture. The close tie between geology and narrative in the moment of Lyell has created an opening for a field of literary study newly interested in geology, attending to the narrativization of natural processes and the different forms of agency depicted therein.[[5]](#footnote-5) Broadly speaking, these studies use a twenty-first-century consciousness of a human-geologic epoch to reread periods of environmental and scientific change in a new light. But in doing so, they generally skip over this dense cluster of proto-Anthropocene theories, and thus the most direct anticipations of our current moment of environmental consciousness.

Though it builds on the foundation of this body of work on literature and the Anthropocene, this study differs slightly in its approach: I reread American literary naturalism in terms of the contemporary theory of the Anthropocene, yes, but most directly through the lens of the proto-Anthropocene theories of humanity-as-force with which naturalist authors were directly engaged. Though I recast this context in terms of contemporary Anthropocene discourse—via the four terms Anthropos, Capitalocene, good Anthropocene, and Plantationocene—I intend to assert the commonalities between the proto-Anthropocene and the Anthropocene without letting the contemporary elide the specificity of the range of human-nature formulations that defined the period of American literary naturalism. Methodologically, I thus join what has recently been termed the “strategic presentism” of other literary studies of the Anthropocene, which recognizes the critical (and especially ecocritical) utility of collapsing the time between distinct historical periods to better trace trajectories and similarities across historical time.[[6]](#footnote-6) It is a particularly justifiable method when addressing something like the Anthropocene, which necessarily exists across multiple temporalities. Generations of human history are a hair’s breadth in geologic time, and living in the early twenty-first century we are forced to imagine what effect the actions of our grandparents will have on our grandchildren.

Bringing the insights of Anthropocene studies to bear on American literary naturalism, then, means not only attending to the ways that these authors represent the human-nature relationship, but expanding the genre’s definition enough to account for the ways it adopts, forwards, and transforms contemporaneous understandings of the humanity as a pervasive natural force. I join generations of naturalist criticism in defining American literary naturalism as a genre at its height from 1890 to 1915 that engaged post-Darwinian science to address the changing relationship of humanity and nature; yet I do not restrict my understanding of post-Darwinian science to Spencerian social Darwinism, as many critics before me have done implicitly, because doing so leaves out the influence of theories of non-human nature that were just as influential on the naturalist project as theories of human nature. I accept engagement with determinism as a defining factor of the naturalist genre, especially environmental determinism, with all the implications (many of them problematic) for economics, race, and theories of the human that this deterministic philosophy implies; yet I will seek to replace the prevailing model of *unidirectional* determinism, in which the human is a blank canvas for the imprint of natural or naturalized external “forces,” with a theory of a dialectical determinism in which humanity and non-human nature are co-constitutive—with humanity having a dramatic impact on the developing forms of nature and that human-influenced nature in turn having a deterministic effect on human behavior. Finally, I will understand naturalism as a genre that takes the human species as a problem of representation, and define the genre by the range of formal experiments it uses to capture human life beyond the scale of the individual and to depict the interaction of natural phenomena on a super-individualistic scale. In each of these areas—philosophical, historical, scientific, and aesthetic—naturalism is defined not by a uniform response or method so much as a common set of questions.

Ultimately, this response to American literary naturalism constitutes less a wholesale redefinition than an expansion of the common ways of defining the genre so that its Anthropocenic environmental consciousness can be accounted for. It is not a matter of making it visible—the traces of it are already visible on their own—so much as theorizing it. But theorizing this consciousness requires first theorizing the scientific moment of the proto-Anthropocene.

**The Anthropocene and the Proto-Anthropocene**

Commonly, accounts of the Anthropocene begin with Paul Crutzen and Eugene Stoermer’s 2000 article in the International Geosphere-Biosphere Programme’s “Global Change Newsletter” as the first official call for an Anthropocene epoch. It is a chronology that immediately complicates itself. In the first place, Stoermer has suggested the 2000 article merely formalized and officially proposed a concept and term that he had been casually using since the eighties. In some senses this move, from a longstanding but casual notion to a formal theory provisionally accepted by an international body of geologists and earth scientists, suggests the real significance of the 2000 pronouncement. For it is less the creation of a new theory out of whole cloth than the culmination of a century and a half of thinking to make it more contemporary in its theoretical backing and political valences, much more rigorous in the stratigraphic basis for its proposal, and more robust in its understanding of human agency in the context of a whole-earth systems theory. In fact, Crutzen and Stoermer themselves allude to the long history of human-geological theorization. Like other commentators in the years since, they sketch a succession of theories from 1864 through the first quarter of the twentieth century that propose, using various terms and framings, a human entry in geologic time ranging from eras to epochs, or more broadly the designation of humanity as a natural force with the same or greater impact as any other natural force (Crutzen and Stoermer 17-18).

Understanding naturalism’s environmental ethos requires an understanding of this cluster of anticipations that I am calling the proto-Anthropocene, but understanding these theories as anticipations (and therefore as a coherent theoretical body of work) first requires an overview of the contemporary theory of the Anthropocene and the mainlines of the arguments that define it. I will therefore first outline the contemporary state of Anthropocene discourse before summarizing the recognized anticipations of it in order to define the contours of the proto-Anthropocene.

*THE ANTHROPOCENE: 2000 –*

In many ways, the conceptual basis of the Anthropocene theory has remained stable since Crutzen and Stoermer first proposed it. They propose that our current geological epoch be named the “Anthropocene,” as opposed to the prevailing understanding of our moment as still part of the Holocene epoch that began around 9,700 BCE.[[7]](#footnote-7) Their reasons are many and multiscalar: population growth, urbanization, fossil fuel emissions and pollution, land use for agriculture, and major changes in the composition of plant and non-human animal life across the globe, particularly through human-driven extinction. These and other transformations will leave an indelible mark in the geological strata of the Earth, legible into the distant future—a framing that geologist and prominent Anthropocene theorist Jan Zalasiewicz dramatizes in *The Earth After Us*, in which he imagines an extra-terrestrial race visiting the Earth some 100 million years in the future to read the traces of our existence in the sedimentation of a post-human planet (Zalasiewicz *Earth*). But the question of legibility is, or ought to be, secondary to what it indicates. Underscoring humanity’s ascension to the status of a geological force is not about identifying visible entries in an archive few can read, but about our unwitting, collective interference with the complex of overlapping systems that make life on our planet habitable by human and non-human organisms alike. Thus, the Anthropocene has been from its beginning inseparable from the call for a robust and global environmentalism, one capable of matching the scale of humanity’s unintended actions with intentional change for the better. As Crutzen and Stoermer put it in their auspicious letter: “To develop a world-wide accepted strategy leading to sustainability of ecosystems against human induced stresses will be one of the great future tasks of mankind” (18).

In this scientific-cum-political struggle to define the Anthropocene, one issue has become both unavoidable and charged with the weight of the political ramifications of admitting humanity’s (or part of humanity’s) responsibility for the fate of the planet: when the Anthropocene is supposed to have begun. Any geologically accepted starting point for the Anthropocene will be defined by a stratigraphic “golden spike,” or Global Stratotype Section and Point (GSSP)[[8]](#footnote-8): a clear sedimentary record in the geologic strata in which some planet-wide momentous shift can be read, which might be left by changes in atmosphere composition (measuring gasses such as methane) or traces of plant and animal life (such as pollen from certain plants). Yet Simon Lewis and Mark Maslin point out that it is hardly a matter whose significance is constrained to science. An early start-date—say the extinction of Pleistocene megafauna at the hands of human hunters—risks “normalizing” the Anthropocene and undercutting its potential as a mobilizing force. Meanwhile, a later epochal shift like the Industrial Revolution, would suggest “assign[ing] historical responsibility for carbon dioxide emissions to particular countries or regions during the industrial

era” (171). Crutzen and Stoermer demur, saying that assigning a more specific start-date would be “somewhat arbitrary,” but ultimately recommend the late 18th century to correspond with industrial revolution in Britain. Since then, the Anthropocene Working Group of the International Union of Geological Sciences[[9]](#footnote-9) has officially recommended a start-date of 1950 (Zalasiewicz “Summary”). While the AWG’s 1950 designation will likely carry the day in official geologic terms, it will hardly settle the question of how to understand the epoch and the forces that caused it. More likely, the political and theoretical distinctions recommended by each will persist in diverging accounts of what led to the Anthropocene and how responsibility should be assigned, including the alternatives to the term that will be discussed in more detail below. To that end, it is worth briefly outlining the range of start-dates commonly proposed, the scientific or stratigraphic case for each, and the political narrative it would seem to imply.

So-called “Early Anthropocene” hypotheses, driven largely by archaeologists, suggest that the beginning of the Anthropocene should coincide with the first agricultural revolution, roughly contemporaneous with the end of the last Ice Age and the beginning of the Holocene, because it marks the beginning of an “unbroken chain” of human influence on the planet (Balter 261). Even earlier theories cite the extinction of Pleistocene megafauna from 60,000 to 10,000 years ago due to a combination of human and climatic factors, a trend that radically transformed the composition of plant and animal life on earth. Both versions of this theory could provide a possible golden spike. Anthropogenic soils leave a distinct sedimentary trace in the strata, and extinctions have been used in the past to define epochal boundaries. Ultimately, however, the events are too globally asynchronous to provide a clear enough signal (Lewis and Maslin 174). This is a good example of what Lewis and Maslin warn could lead to the normalization of the Anthropocene: defining the conditions for the development of our species as a catastrophe is unlikely to be as mobilizing as a more recent event that would enable a more thinkable set of alternatives.

The “Orbis hypothesis” takes the colonization of the New World as its inciting incident, and its “golden spike” as the massive dip in CO2 that resulted from the deaths of at least 50 million indigenous people because of genocide and disease, a tragedy of such a magnitude that it registered in the strata of the earth. While the primary stratigraphic signal results from the regrowth of forests and animal life with the decline of hunting, cultivation, and the use of fire to clear land (Faust et al.), the impact of colonization and trans-Atlantic trade was more multifaceted, encompassing the intentional transfer of plant and animal species and the consequent transformation of agricultural patterns around the globe (Lewis and Maslin 174-5). While this process begins in 1492, the 1610 date reflects the minimum CO2 levels by 7-10 PPM[[10]](#footnote-10) as the result of resurgent forests providing a major carbon sink, a shift so dramatic as to cause the “Little Ice Age,” a drop of average temperature in North America by 1°C that resulted in more extreme winters and cooler summers (Lewis and Maslin 175, Faust et al.). Members of the Anthropocene Working Group unanimously ignored this recommended date because the stratigraphic signal did not describe the trend, many of the effects were asynchronous (particularly plant and animal transfer), and because the “Orbis spike” does not present a strong enough stratigraphic signal (Zalasiewicz et al. “Colonization” 119-21, “Summary” 58). Politically and historically, the Orbis hypothesis presents a compelling narrative, as the colonization of the New World is an inciting date in the march towards globalization and the increasing determinative influence of major world powers on the fate of the planetary environment. And yet it carries the same “normalizing” risk of Early Anthropocene theories while also shifting responsibility away from the immediate and technological causes of climate change represented by fossil fuel emissions and industrialization.

Taking the Industrial Revolution as a starting point, however, would emphasize precisely these technological developments, aligning the Anthropocene roughly with the discovery and use of fossil fuels and the increased magnitude and intensity of human activity it enables. Crutzen and Stoermer invoke James Watt’s invention of the steam engine in 1784 as an inflection point in the nature of humanity’s interaction with the natural world, the moment at which the actions of (some of) humanity began taking actions that would ultimately lead the various earth-systems beyond the boundaries of the Holocene in several categories (Crutzen and Stoermer “The ‘Anthropocene’” 17-8). The resulting abundance of energy supported an increase of population, percentage of land used for agriculture and production, and the rise in atmospheric greenhouse gases from 1800 – 2000 (Stefan et al. “Anthropocene” 848-9). While much of this increase is attributable to the period after the “Great Acceleration” (see below), the trends that found themselves accelerating began roughly with the industrial revolution. And yet, the problem of faint or ambiguous stratigraphic evidence afflicts this periodization, as well, because it is only when the processes beginning during this period grow considerably in magnitude that they leave a stratigraphic trace (Lewis and Maslin 175-6). In this sense the geological and the historical are at odds, for intuitively the invention of the steam engine makes the most intuitive sense (and the easiest explanation) with regard to those who have profited from the conditions that created the Anthropocence and what will need to be done to address it.

Yet the date almost certain to define any official adoption of the Anthropocene as a geologic epoch chooses to emphasize the Great Acceleration, but does so using a stratigraphic signal almost wholly disconnected from the conditions that defined this acceleration. Members of the Anthropocene Working Group overwhelmingly voted to recommend a start-date of January 1, 1950, but the vote for a corresponding stratigraphic signal was narrower, ultimately recommending the plutonium fallout from nuclear tests from a range of options including plastics and carbon dioxide concentration (Zalasiewicz “Summary” 58). The results of nuclear bomb testing may produce the “sharpest and most globally widespread signal” (58), but the story this signal tells has nothing to do with the main drivers of mass extinction and the amount of carbon in the atmosphere—which the AWG would likely say is not the purpose of a GSSP, but which nevertheless matters for the impact of Anthropocene thinking beyond the scientific community.

It also precludes any meaningful association of proto-Anthropocene theories with the current dominant theory, which may be part of the point. Clive Hamilton, along with AWG member Jacques Grinevald, has argued that claiming the Anthropocene was anticipated is a fallacy of “precursoritis,” the spurious search for precursors to existing theories, and that it ultimately deflates the significance of the Anthropocene and “rob the new geological epoch of its power” (62). The Anthropocene, they argue, has resulted from the relatively recent understanding of a holistic earth-system unavailable to the earlier theorists. And yet, while current calls for a human-centric geological era have a different basis, they nevertheless represent the beginning of an understanding of humanity as the main force determining the shape of life on the planet and the proposal to reflect this influence in a designated segment of geologic time.

[note: make a damn chart]

*THE PROTO-ANTHROPOCENE: 1864-1927*

The theories that make up the proto-Anthropocene refer to the same phenomena that the Anthropocene does, but in advance: they anticipate the levels of impact humanity would eventually attain over the planet, reading the trend of inexorable growth almost at its onset. Observing the birth of industrial modernity in the decades surrounding the turn of the twentieth century, they speak from a wide range of disciplines and backgrounds of humanity’s near-total domination of non-human life and systems, focusing less on stratigraphic evidence than the changing narrative of our place on the Earth. While they may not have had a modern understanding of earth-systems theory, they arguably did not need it to understand this inauspicious change. As Will Steffan et al. argue, “The onset of the Great Acceleration may well have been delayed by a half- century or so, interrupted by two world wars and the Great Depression. The embryo of the phenomenon was clearly evident in the 1870-1914 period”—or even sooner, as it was to George Perkins Marsh by 1864 (850). It is more common for literary studies of the Anthropocene to pass over the theories that I am collecting under the heading of the “proto-Anthropocene,” either focusing on contemporary forms of climate fiction or, perhaps even more commonly, to the origins of geology and the Holocene with Comte de Buffon and Charles Lyell.[[11]](#footnote-11) The literary influence of this later period, which bears a much clearer relation to the contemporary theory of the Anthropocene, remains largely unexplored. [oh boy, make sure *that’s* true]

Not every attempt to name the most recent stage of geologic time after humanity should be considered a proto-Anthropocenic theory. Any anticipation of the Anthropocene must at least assert a significant difference in the makeup or function of the planet on a planetary scale as the result of human activity. By contrast, James Dwight Dana’s *Manual of Geology* names the geologic present both “The Age of Mind” and “The Era of Man,” but does not mean that human activity has significantly influenced the biological and geological working of the planet during this period. Rather, he means it in a more teleological and spiritual sense: since all creation and geologic time is understood in his system to culminate in the appearance of the human, it is natural for Dana to name the final period “The Age of Man.” That is, it is a human-centric period of geologic time only in that it is the period *in which humanity appears*: “In the appearance of Man, the system of life, in progress through the ages, reached its completion, and the animal structure its highest perfection” (578). The concept of humanity at the end of and as the head of geologic time would recur throughout several proto-Anthropocenic theories, but coupled with a sense (absent in Dana) of the profound transformations that occur as a result. I will consider as proto-Anthropocenic any theories that see the booming growth of humanity between the Civil War and the First World War as an event of planetary significance and theorize the nature of this influence, even if the theories that result differ widely in their character, motivations, and forms.

The first such theory, and almost certainly the most influential, was George Perkins Marsh’s *Man and Nature*. Marsh was a polymath, practicing law, teaching English courses at Columbia, and eventually appointed by Lincoln as the ambassador to Italy, among other political appointments—but all the while observing the many and various impacts of human activity on the environments in which it occurs, particularly in European contexts where continual and intensive inhabitation had persisted for millennia. The resulting work was far and away his most enduring legacy: *Man and Nature*, first released in [] and later released in an expanded edition under the title [] in [] (Lowenthal “Introduction” xi-xviii). *Man and Nature* traces the many ways that humanity, understood as a collective, has damaged the natural world, from the impacts of domestication and anthropogenic extinction to the total exploitation of natural resources beyond the threshold of replenishment to the wholesale transformation of extensive regions (cf. Lowenthal “Origins”).

Remarkable in its own right as a pioneering work on conservation, it is doubly so in the extent to which it anticipates a twenty-first-century understanding of the human as a geological agent. Marsh does not propose a human-centric unit of geologic time, but the case of Dana shows that doing so is insufficient to making a theory an Anthropocene anticipation—and the relevance of Marsh’s thinking to the Anthropocene despite not proposing a definite epoch or era shows that doing so is also unnecessary. The conclusion of *Man and Nature*, which projects the book’s findings forward into the future, summarizes the increasing potency of human agency as destined to exceed the scale normally assumed to circumscribe it, ultimately becoming geological:

I have often spoken of the greater and more subtile natural forces, and especially of geological agencies, as powers beyond human guidance or resistance. This is no doubt at present true in the main, but man has shown that he is not altogether impotent to struggle with even these mighty servants of nature, and his unconscious as well as his deliberate action may in some cases have increased or diminished the intensity of their energies. (459)

And in some cases, Marsh even saw that already “human action must rank among geological influences” (464). Already the geologic scale of action and consideration is taken as the outer limit of humanity’s influence on the planet, the point past which a new paradigm is needed to describe the nature of the interaction. He announces the distinction of his theory from the prevailing understanding of humanity-in-nature: where humanity was generally taken as an entity constrained and shaped by resistless natural forces, a characterization would only increase in influence as the post-Darwinian moment gathered momentum into the twentieth century, Marsh sees humanity becoming as powerful as (and therefore almost indistinguishable from) those natural forces, and therefore able to break free from their supposed dominating influence. Other proto-Anthropocene theorists would find much to celebrate in this apparent freedom, but not Marsh. While he believes in the powers of remediation and reform to mitigate the worst impacts of conscious and unconscious environmental despoliation, he always finally returns to his theme that anthropogenic environmental transformations disrupt the natural balances that came before—indeed, that it is this very ability to disrupt and to transcend natural balancing that defines humanity against other species that transform their environments.

From the wellspring of Marsh’s landmark work, proto-Anthropocene theories sprung, dividable according to roughly two factors: whether they are secular or religious and whether the theory shares Marsh’s concern with conservation or exalts in humanity’s apotheosis to the status of a natural force. But despite these differences, there is a core of similar ideas and values uniting them. Proto-Anthropocene theories tend to be teleological, explicitly or implicitly, in their assumption that humanity is the apex of geologic time and the evolutionary process. In some cases this is an expression of a divine guiding hand, as in the cases of Reverend Houghton, Reverend Antonio Stoppani, Reverend Pierre Teilhard de Chardin, and to a lesser extent Joseph LeConte (not a Reverend). In other cases, the teleology can more likely be placed in political rather than religious context: Soviet scientists Alexei Petrovich Pavlov to a minor extent and Vladimir Vernadsky to a greater extent were active in Soviet politics as well as their scientific work, and Lester F. Ward’s theory of planetary human agency developed in the context of a near-utopian politics of collective social reform and critique of laissez-faire economics. None of them share Marsh’s view of humanity as a destructive force, and even the secular theories celebrate human control of the planet as rightful and positive development.[[12]](#footnote-12)

Of the overtly theistic theories, Antonio Stoppani’s “Anthropozoic Era” is the best known and most frequently mentioned in contemporary accounts of the Anthropocene, probably because of Stoppani’s influence on Italian geology in general and the resultant availability of his texts. The theory as he lays it out is representative of theistic proto-Anthropocenic theories more generally—even the distant precursor of Comte de Buffon’s *Les Epoques de la Nature*—in its teleological basis and triumphalist tone. In his three-volume *Corso di Geologia*, published between 1871 and 1873 (between the two editions of Marsh’s *Man and Nature*), Stoppani identifies “[c]ivilized man” as “a new telluric” (or planetary) “force that, for its strength and universality, does not pale in the face of the greatest forces of the globe” (qtd. in Hamilton and Grinevald 63). It is a state of affairs that calls for the “dignity” of a new era. While Stoppani’s tone occasionally veers into a critical depiction of use as destruction (“man undoes what nature has done,” “tearing” precious metals “from the bowels of the earth” [Federeighi]), he is more generally neutral or triumphal in describing humanity’s place among the other “telluric forces.” Though we now understand the suddenness and severity of earth-system change as a rupture that distinguishes our artificial shifts from natural (and therefore assimilable) geologic transition, to Stoppani the suddenness of this transition marks a coup: “Man has been in possession [of the earth] for only a short time; yet, how many geological phenomena may we inquire regarding their causes not in [natural] telluric agents…but instead in man’s intellect, in his intruding and powerful will” (Federeighi).

The “intellect” and the “will”: expressions of mind are a defining theme of the proto-Anthropocene, particularly in the case of the two theorists most relevant to this study, Joseph LeConte and Lester F. Ward. They represent a similar conception of a unified humanity’s role in a unified nature—as organizer, guide, even savior—but their theories are separated by utterly distinct teleological motivations, with LeConte basing his “Psychozoic Era” in a theistic evolutionary paradigm and Ward elaborating a progressive social framework in which humanity assumes direct guidance of its own development as a species and that of the planet as a whole.

Joseph LeConte, as discussed above, is already a well-known figure in criticism of American literary naturalism because of his influence on Frank Norris, an influence almost exclusively traced through the concept of “force.”[[13]](#footnote-13) But to the rest of the world at the time, he was an influential geologist and biologist, for a long time teaching courses like those Norris took at Berkeley and publishing numerous textbooks and scholarly monographs on topics across the earth sciences. He first proposed the concept of a Psychozoic Era in a monograph in 1877, thirteen years after Marsh’s *Man and Nature* and four after Stoppani’s *Corso di Geologia*, though in doing so he introduces the term not as a coinage so much as an existing informal usage—the present, he says, may be “less distinct,…the interval less long,” but since it is “dignified by the appearance of man as the dominant agent of change,” it should “therefore [be] well entitled to the name *Psychozoic* sometimes given it” (“Critical” 556). Echoing Stoppani’s diction, LeConte makes repeated reference to “[man’s] transcendent dignity,” but the cause for naming an anthropocentric era is due less to that dignity than to collective humanity’s “importance as an agent which has already very greatly, and must hereafter still more profoundly, modify the whole fauna and flora of the earth” (“Critical” 556). Unlike Dana, who merely named an era anthropocentrically to reflect the presence of humanity, LeConte conceives of humanity as a unified force, one of increasing power that is increasingly transforming the functioning of an equally unified nature.[[14]](#footnote-14)

His geology textbooks, beginning in 1882, elaborate the case, making clear that the rule of mind is a relatively harsh one from anything but a human perspective. Humanity is painted as at once animal and super-natural: firmly entrenched among the order of primates and thus undistinguished from non-human animals, and yet physically *acting* in such a way that the species “must be set off not only against the animal kingdom, but against the whole of Nature besides, as an equivalent: Nature the *book*—the revelation—and man the *interpreter*” (“Elements” 586-592). Nature as a “revelation” maintains the religious register of the schema, while identifying “man” as the “interpreter” establishes humanity as the thinking layer of the planet—the “psycho” in “Psychozoic.” This “thinking” ultimately means organization and domestication, revising the orders of “*brute force* and *animal ferocity*” into a form consistent with human needs (“Elements” 586-7). “Useful” animals are preserved, while megafauna go extinct, and otherwise “noxious animals and plants” are diminished (“Compend” 381). The rational organization according to “Reason” is ultimately a reorganization according to human needs, not yet far enough along for its destructive effects to be realized. As will be seen in chapter two, in picking up this concept Norris introduces a much keener, more critical sense of what such a rule of “rationality”—read: profitability—would do to the earth, ultimately breaking from his favorite teacher while simultaneously using his work as a foundation.

Lester Ward was more attuned to the needs of conservation and to the potentially catastrophic impacts of human control gone wrong, but fundamentally shares LeConte’s faith in the power not just of remediation, but improvement. Before he made his name as a sociologist, he was the chief paleobotanist of the U.S. Geologic Survey led by Major John Wesley Powell, the second director of the USGS and an important early figure at the Smithsonian whose disciples would go on to contribute to legislation like the Reclamation Act of 1903—indeed, Ward’s *Dynamic Sociology* was able to be written largely because of the support Powell and the Survey offered (??). Powell’s work exhibited a Marsh-inspired focus on remediation and conservation, which would have been a topic of some relevance during their many and frequent conversations (Ross #?). Consequently, *Dynamic Sociology* criticizes the exploitative and exhaustive use of resources that often defines transformations of nature—expediency and the satisfaction of “temporary wants” lead to deforestation, soil exhaustion, and extinctions, which if unchecked could lead to “degeneracy over the whole globe…rendering the world uninhabitable except by a race of miserable beings” (52-3, 88-9).[[15]](#footnote-15) To whatever degree Ward was exposed to Marshian ideas, though, he would refuse the fundamental assumption that nature is any sense superior to the forms it could take with human guidance. To him nature was wasteful, acting “on the assumption that her resources were inexhaustible,” just like humanity at our worst (#). The solution was for humanity to be better—a position that leads him, and Charlotte Perkins Gilmans after him, into a dangerous complicity with eugenics (see chapter three).

Ward did not propose a theory of a human-geologic epoch, era, or any other unit of geologic time, but he shares with the other proto-Anthropocene theories, particularly the Psychozoic theory and the Noösphere theory (below), an understanding of collective human intelligence as a natural force outweighing other major forces of nature and acting on a planetary scale. Humanity is at once part of “this great unconscious whole called nature” and the consciousness that raises it out of the supposed chaos and wastefulness that has prevailed so far—with the key difference that where nature’s forms of development are primarily genetic, which is to say random, humanity’s are teleological (9). While not speaking of Stoppani specifically, Ward nevertheless differentiates himself from the theistic mode Stoppani’s theory represents, a mode that he sees as mistaken precisely because it imputes a teleological and “optimistic” character to events that are natural and therefore “genetic” (73). In his explicitly Baconian view, Ward frames nature, as LeConte does, as the “interpreter” of nature, which for him means the thinking mind that brings teleology and “conation” (or ‘striving’) action to a world system that otherwise lacks it (9-10, 93). This is not rendered as a defining geologic force, as in the Anthropozoic and Psychozoic theories, nor as a physical layer atop the biosphere, as the Noösphere theory would be. But it is a planet-scale shift in the operations of nature that arises out of a collective human agency. Balancing natural phenomena and forces of the earth are the artificial natural phenomena and forces, which consist of “transformations effected upon the globe my man—which without his rational actions, would not have taken place, and which may be designated in general phrase as due to the agencies of civilization” (106). Like LeConte’s world-organizing, collective human mind, Ward envisions a humanity acting with united purpose to transform nature into a more efficient form of itself.

Later mind-focused theorists of the proto-Anthropocene would go even further than LeConte and Ward, arguing not merely that the collective human intellect is a defining factor in planetary forces and systems, but that the intellect of the Anthropos, the human-as-species, can be conceived either as a geophysical layer in itself. The resultant noösphere theory combines the Greek “noús” (‘mind’) with the concept, derived from Eduard Suess’s *La Face de la Terre*, of the “biosphere”: this space defined by the area on and above the surface of the Earth that contains ecosystems and organisms becomes a noösphere dominated by the human mind. The provenance of this theory is complex, as it arose in conversation between several theorists on different sides of the theistic divide in proto-Anthropocene theories: Pierre Teilhard de Chardin, a Jesuit Priest; Édouard Le Roy, a disciple of Henri Bergson, mathematician, and philosopher; and Vladimir Vernadsky, the founder of biogeochemistry. Vernadsky met Teilhard and Le Roy during the former’s time in France from 1922 to 1925, after which point all three men adopted the term “noösphere” in some capacity (Steffan et al. “Anthropocene” 845, Hamilton and Grinevald 65-7).

The theistic version of the noösphere bears significant resemblance to the other theistic proto-Anthropocene theories in its emphasis on a divine teleology. For Teilhard and Le Roy, both Catholics, the noösphere was a combination of “an Enlightenment faith in the power of the Mind with a new Christian story of cosmogenesis—biogenesis and, finally, anthropogenesis” (Hamilton and Grinevald 65). According to Teilhard, the development of the noösphere, a realm of thought “outside of above the biosphere,” was “the final maturing and ecstasy of Mankind” (qtd. in Hamilton and Grinevald 65).

Vernadsky’s version was more complex, scientific, and enduring. His new theory of geochemistry included references to the geochemical activity of humanity through increasingly advanced agriculture, part of a more general recognition of the planetary and geologic scale of humanity’s influence. Where other organisms merely influence the geochemical makeup of their immediate environment insofar as is necessary for their basic survival, humanity “widened this circle,” causing exchanges and transformations to support a host of further-reaching needs. It sums to a “more pronounced influence of consciousness and collective human reason upon geochemical process,” one that continues to grow at “a surprising speed” (Vernadsky, qtd. in Steffan et al. “Anthropocene” 845). Here, too, consciousness and reason are the basis of a human-geologic concept; before adopting the noösphere moniker from his interactions with Teilhard and Le Roy, he opted for the “Psychozoic Era” to describe the same set of phenomena. The scale of this influence, for Vernadsky, is enough to constitute a phase shift in both human and natural history: “In the twentieth century, man, for the first time in the history of the earth, knew and embraced the whole biosphere, completed the geographic map of the planet Earth, and colonized its whole surface. *Mankind became a single totality in the life of the earth*”—indeed, for the first time, “*a large-scale geological force*” (Vernadsky 8-9). In elaborating this vision, Vernadsky cites several of the other theorists mentioned here, charting an intellectual trajectory for the proto-Anthropocene from Dana to LeConte to his immediate interlocutors in Teilhard and LeRoy (7).

1. cite. Is this a straw man? [↑](#footnote-ref-1)
2. I adopt this term from Jason W. Moore… [↑](#footnote-ref-2)
3. In Erdheim’s case, the evidence seems less to threaten the structure of determinism in naturalism than actually to reinforce it… [↑](#footnote-ref-3)
4. Uuuh footnote, I guess reading in the Anthropocene?? [↑](#footnote-ref-4)
5. That one essay in reading in the Anthropocene??? [↑](#footnote-ref-5)
6. Cf. Dimmock. [↑](#footnote-ref-6)
7. It is more common to date geologic time using the “before present” (BP) system, which records years relative to January 1, 1950, or the Megannum (ma) system, which measures time in millions of years. For ease of reference to events in human history, I will instead use the BCE system. [↑](#footnote-ref-7)
8. Alternatively, it could be determined by committee in the form of a Global Standard Stratigraphic Age (GSSA), but most commentators agree that a GSSP is both likely and preferable in defining a starting point for the Anthropocene. [↑](#footnote-ref-8)
9. Technically, a working group of the International Commission on Stratigraphy’s Subcommission on Quaternary Stratigraphy. [↑](#footnote-ref-9)
10. Parts per million of carbon in the atmosphere. For context, normal Holocene variability in CO2 levels in the atmosphere is roughly 260 PPM – 285 PPM (Stefan et al. “Anthropocene” 848-9); climate scientists and environmental advocates suggest that 350 PPM is the maximum level of carbon in the atmosphere that can be allowed if global warming is to be restricted to 2°C (?); and the current level as of July 2018 is 408.71 PPM (?). [↑](#footnote-ref-10)
11. Uhhh cite. especially draw from Anthropocene Reading [↑](#footnote-ref-11)
12. Ward is a slight exception, as discussed in chapter three. [↑](#footnote-ref-12)
13. Sources – evolutionary theism – see chapter 2 [↑](#footnote-ref-13)
14. LeConte dates his era from an undefined moment past which humanity could be said to have attained “mastery” and “supremacy” over the planet, thereby initiating “the reign of man” (“Critical” 556). While (*pace* Hamilton and Grinevald) LeConte preceded *modern* earth-systems theory, he nevertheless has a holistic view of overlapping earth systems. As he writes in *Evolution*, “Nature as a whole is...a system of correlated parts,” with the system as a whole divided into systems that maintain equilibrium and those evolutionary systems that move the system forward (3-4). He elsewhere uses the organismic metaphor of the tree to represent the entire organic world (13-4). [↑](#footnote-ref-14)
15. Ironically, it is the discovery of coal that Ward supposes has saved us from this degeneracy. He even muses that the formation of coal might have created the conditions necessary for human life “by the removal of the excess of carbonic acid and liberation of its combining oxygen,” but does not go as far as to ask what impact burning that coal might have on the same atmosphere its formation created (52-3). [↑](#footnote-ref-15)