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"They Shall be a Kosmos:" Alexander Von Humboldt and the Ecopoetics of Walt Whitman

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“They Shall be a Kosmos:” Alexander Von Humboldt and the Ecopoetics of Walt Whitman

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Introduction

In "Song of Myself" Walt Whitman promises to "permit to speak at every hazard, / Nature without check with original energy" ("Song of Myself: 1", 13). In response to Whitman's figuration of Nature in his poetry, critics have given attention to how Whitman treats geographies, plants, animals, geological, and astronomical phenomena as sources not only for reflection on moral and philosophical truth, but also as vivid interconnected natural systems. Whitman extends beyond his proximal romantic and transcendental influences, developing an "ecopoetics," using Johnathon Bate's term, that "asks in what respects a poem may be a making (Greek *poiesis*) of the dwelling place—the prefix eco- [being] derived from Greek oikos, 'the home or place of dwelling'" (75).[1] Whitman's poetry tests the limits of the interconnected relationships of nature's material phenomena and in doing so his poetic persona attempts to inhabit the Earth on its own terms. Then, in turn, by "accept[ing] the lesson with calmness" that persona can speak to the vista of American democracy in order for it to truly nature's laws, "the American poet is to be transcendent and new," as Whitman states at the outset of his poetic project in the 1855 preface to *Leaves of Grass* (489).

Whitman's poetics—his making of the dwelling place—do not stand alone from other attempts to *know* the dwelling place, Earth. The prefix "eco-" which, as Bate states, denotes the "home or dwelling place" also began to be combined with the suffix "-ology" during the course of Whitman's lifetime, defined as the "name of science or department of study," to form ecology (originally coined by Ernst Haeckel in 1866)[2]. Ecology is the study of the Earth's interconnected

[1] In using Bate's "ecopoetics," my work here uses the same theoretical framework that ecocritical studies of Whitman have used in the past to understand the poet's relationship to nature's materiality and complex interactions, including James Killingsworth and Christine Gerhardt.
[2]See Worster, 1991, 1.

natural systems through empirical science (OED, "-ology").[3] The scientific discipline of ecology was novel during Whitman's lifetime, but its origins extend at least into the natural philosophy of the mid-eighteenth century. Historian Donald Worster attributes the first inklings of its developmental ideas to the naturalist Gilbert White, who in *The Natural History of Shelburne* states that "Nature is a great economist, for she converts the recreation of one animal to the support of another!" (qtd. in Worster, 24). I hold that Whitman's ecopoetics are deeply informed by this scientific study. In the 1876 preface to *Leaves of Grass*, the poet writes that "Without being a Scientist, I have thoroughly adopted the conclusions of the great Savans and Experimentalists of our time, and of the last hundred years, and they have interiorly tinged the chyle of all my verse" (520).

This thesis takes Whitman at his word and considers his embrace of the "Kosmic Spirit" of science, that he holds must "be the background and underlying impetus, more or less visible, of all first-class Songs" (520). In what follows, I offer a study that grounds the ecopoetics of Walt Whitman in the context of the developments in the natural sciences during his lifetime. To do so, I examine Whitman's characterization of empirical science possessing a "Kosmic spirit." The description carries another neologism of Whitman's lifetime, "kosmos," coined by the German naturalist and polymath Alexander Von Humboldt (1769-1859) as the title to his major-work, *Cosmos: A sketch of the physical description of the universe* published in 1845 "to offer to the world his vision of humans and nature as integrated halves of a single whole," as the biographer Laura Dassow Walls writes (1). Whitman uses "kosmos" throughout *Leaves of Grass* to describe himself, and also as the descriptor for the iconoclasm his ideal American poet brings

[3] The Oxford English Dictionary points out that the etymology of the suffix -ology is greek, "*-λογία"*, but that a definite meaning of the original suffix is lost, therefore the English word carries a unique meaning from its original suffix.

to the literary arts, “The American bards... shall be a kosmos without monopoly or secrecy” he writes in the 1855 preface of *Leaves of Grass* (497). Both Walls and David Reynolds have previously held that this concept of the kosmos is an influence directly attributable to Von Humboldt, with Reynolds writing that “if Humboldt uses the word to present a theory of the earth and the heavens, so too does Whitman” (245). Whitman’s turn towards a science that contains the “Kosmic Spirit” further suggests that specific scientific influence is one shaped by Von Humboldt. Heretofore, however, an extensive account of how Von Humboldt’s philosophy of science shaped Whitman’s ecopoetics has yet to be completed, a vital project to more completely situate the epistemological avenues the poet traveled to create his attunement to the natural world in his poetry. This thesis fills an important niche in critical discourse concerning Whitman and Von Humboldt, but also gestures towards an understanding of ecopoetics that recognizes verse as one way of knowing the Earth situated within a system of epistemological frameworks.

My argument proceeds in two parts. In the first chapter, I explore the place natural science takes in Whitman’s poetic theory, where it acts in a co-production of knowledge about the natural world, informing the underlying epistemology of his poetry (*Leaves of Grass,* 498). I connect that epistemology to the aesthetics Whitman utilizes in *Leaves of Grass,* arguing that the verse which defines his ecopoetics is imbued with the methodologies used in the natural sciences at the time. I then connect these principles to the specific influence of Von Humboldt, showing how the scientist’s “plant geography” is apparent in Whitman’s treatment of vegetative life in *Leaves of Grass*.

In Chapter Two, I explore the interconnection between Whitman’s ecopoetics and his aim to create “a new race of American bards” which “shall be a kosmos” (*Leaves of Grass,* 498),

holding that Whitman's ecopoetics was crucial to his vision for America to realize democracy, which he held in *Democratic Vistas* "to be at present in its embryo condition" (36). I argue that Whitman's vision of the American poet as a "kosmos" to reflect democracy, replies upon Von Humboldt's work viewing the universe as governed by a complex set of unwavering natural law as encompassing a physical description that may act as an edict to form political systems around. In his assumption that natural phenomena abided by these unwavering laws, I argue that Whitman's ecology became a political ecology, and therefore his ecopoetics a political ecopoetics. Finally, I illustrate how Whitman's political ecology mapped onto his American Republic as he envisioned it in the 1860 *Leaves of Grass* sequence of the "Democratic Chants", placing his ecopoetics into environmental discourses that resonate from their origin in the nineteenth century to our present ecological moment.

That resonance is as important in considering Whitman's poetic influence as it was to Whitman himself, who concludes the preface to the 1855 edition of *Leaves of Grass* with the statement that "the proof of a poet is that his country absorbs him as affectionately as he has absorbed it" (507). This thesis holds that by fully understanding how Whitman sought to absorb the scientific kosmos of Von Humboldt in his attempts to articulate a democratic identity for the his developing country, we can in turn absorb the notion that the American version of democracy relies on an understanding a series of interconnected landscapes that are in themselves political. In recognizing the ecopoetics of one of our greatest national poets within the full epistemological contexts of how that ecopoetics was articulated, we may turn towards Whitman's poetry and turn towards the ecologies it interacts with to act for a renewed interest to act so that those landscapes and our democratic ideals retain their original energy.

Chapter I: The Final Applause of Science:

Science in *Leaves of Grass* and Whitman's Ecopoetics

Science and Poetry in Whitman's Epistemology

Even before recent developments in ecocriticism and the environmental humanities more broadly, critics have acknowledged that Walt Whitman's poetry shows an acute interest in "the visible and solid earth," with nineteenth century John Burroughs an early advocate of readings in this vein (Burroughs, 10). That critical interest in Whitman's attention to the intricacies of nature and their connectedness—"the land and sea, the animals fishes and birds, the sky of heaven and the orbs, [and] the forests mountains and rivers"—has not always accounted for the poet's influence from other branches of knowledge—specifically, the natural sciences—contemporaneously seeking out the same "grand themes" in these natural objects (*Leaves of Grass*, 494). For Whitman, however, the embrace of the Earth in his poetics was one that was deeply informed by contemporary natural science. In the preface to the first edition of *Leaves of Grass* (1855) Whitman enthusiastically embraces the influence of science in his poetry, stating that "exact science and its practical movements are no checks on the greatest poet but always his encouragement and support" (498). Furthermore, the extent to which the natural sciences "support" the poet is nearly complete in Whitman's own view. In envisioning the ideal of the American poet in the preface, Whitman goes as far as to claim that "The American bards shall be marked for generosity and affection without monopoly or secresy… They shall be a kosmos…" pointing to the conflation of the poet's ideal with that of Von Humboldt's magna opus to create a complete sketch of physical phenomena in nature (497). While my primary focus is on how Whitman constructs Von Humboldt's kosmos, however first I shall pause and more completely

understand how science is understood in the knowledge-making process of Whitman's poetics, and in doing so point towards the poet's own belief in a new "theory"—or epistemology—that he held would define the unique tradition of the American poet.

In his preface, Whitman is careful to never fully endorse epistemological priority of the natural or human sciences, though he does separate the two into distinct ways of knowing. "[the scientists] are not poets, but they are the lawgivers of poets and their construction underlies the structure of every perfect poem" (498). The statement constitutes a co-construction of knowledge between the two according to a shared object of study—nature. The contribution of the natural sciences is not simply the "laws" of nature they know but extends to how they construct that knowledge. The poet and scientist are more deeply engaged in how they construct knowledge, and that epistemological symbiosis leads Whitman to state that "in the beauty of poems is the tuft and final applause of science" (498) In describing the beauty of poems as a "tuft" Whitman shows a pattern that persists in his poetry over his incorporation of science, taking care to specifically use its jargon to point to natural objects. A clear example of this technique is found in the very title of *Leaves of Grass,* where scholar Christine Gerhardt notes "Whitman's use of 'leaves' rather than 'blades' clearly draws from the science of botany" (340). Choosing to use "tuft" he draws a metaphor from the contemporary life sciences' increasing use of the word, where in both cases the word is used to signify small physiological structures in plants and animals that start at a single source and emanate outward to many parts, "a bunch of small-things attached at the base" (OED "tufts"). Whitman's use of the term is at once scientific and metaphoric. From natural science emanates the knowledge of the natural world that could be applied to understanding the human condition, and the human condition in relation to other humans—politics.

The poet elucidates the beauty of the natural laws discovered by the natural sciences. The "final applause of science" is the beauty of the definite laws of nature represented related to human experience in poetry. In poetry, for Whitman, the beautiful aestheticizing of natural truth. The American bard he envisions at the outset of his poetic project in the 1855 preface to *Leaves of Grass* is the amalgamation of the Romanticism of the previous half-century and a bold step towards understanding phenomena as they appear in the material world seen through the natural sciences.[4]

Romanticism as a defining set of ideals in Whitman's poetic project has, of course, always been a central critical interest for scholars of Whitman. Edward S. Cutler chronicles the poet's engagement with Romanticism as an intellectual movement in his notes and transcripts, noting Whitman's attention not only to the major British Romantic cannon, but also with a particular strand of German Romanticism that flourished in at the outset of the movement in the late eighteenth century which sought to distill Kantian metaphysics into poetry, with "the [poetic] work a center of reflection upon the absolute" (332). Meanwhile, placement of Whitman within the American literary canon has tended to, as Virginia Jackson notes, identify the poet as "the personification of the Emersonian iconoclast, the original genius who smashed American poetry's dependence on borrowed conventions and forged post-romantic modern American poetics with his bare hands" (326). Whether read historically or not then, Romanticism is a strong fertilizer in the ground Whitman's *Leaves of Grass* springs from then, but Whitman's own telling of his poetic project in the 1855 preface suggests that he steps beyond simply literary

[4] Whitman's comment on "the beauty of poems" bears his influence from the epistemological beliefs of Romanticism. Take, for example, Keats' final line in "Ode to a Grecian Urn," "'Beauty is truth, truth beauty, —that is all Ye know on earth, and all ye need to know.'" (49-50). The famous assertion commits to a view of truth as timeless, contained within the urn he beholds, an aesthetic representation in poetry of the broad view of Romanticism toward the timelessness of natural law and therefore the ability of poetry to connect to it.

Romanticism, seeking to offer reconciliation between the ever-changing understanding of the world brought forth by empirical science and the timelessness of the natural laws those material sciences understood. By asserting the beauty of poetry as a tuft of science, he draws science into his epistemological framework by stating that it reveals the complexity of the absolute that the poet seeks to reflect accurately in their work. Empirical science acts as a way to coalesce the understanding of the whole unified natural universe that Romanticism stood in awe and terror of, studying the object of natural phenomena to understand unwavering natural law.

To appreciate this conciliation of scientific knowledge and poetry, however, one must consider the philosophical tenets of the natural science Whitman encountered in his historical moment. In doing so, the scope of Romanticism's influence on Whitman only grew, for Romanticism as an intellectual movement touched not only the literary and philosophical corners of knowledge that Whitman waded in, but also the empirical sciences. Von Humboldt, for example, not only had a close personal relationship with Johann Wolfgang von Goethe and a working relationship with Friedrich Schiller, but developed an approach to natural science underscored by the belief that, as Malcolm Nicolson writes, “Man’s aesthetic sensitivities could ... transcend the limitations of reason, beyond the surface of phenomena and, sensuously and intuitively, grasp the underlying unities of Nature” (179). The full extent of the shared influence of German Romanticism on Von Humboldt and Whitman is explored later in this chapter, but for the moment my key point is that the “original science” Whitman fashioned his poems as the final applause of was encompassed with a distinctly Romantic outlook toward the world, and that constitutes part of the configuration of the post-romantic American poetry Jackson argues Whitman forged (326).

Recognizing Whitman's positive emphasis on the importance of natural science in constructing his American poetic project in the 1855 preface is important in that both points to previously unexplored aspects of the aesthetic qualities that guide the noted attention to the natural world in his poetry, and to the poet as a figure outside of the scientific community but of the time, but deeply engaged with it, as that community navigated the challenge to Enlightenment rationalism that Romanticism posed. This chapter revisits what Gerhardt calls "one of the most multifaceted contexts of Whitman's work"—the natural world—with an attention to how his deep interest in contemporary natural science guides both the insights his poet persona draws from the environment, and the aesthetic choices it uses to build those insights through poetry. The poet's self-professed epistemological incorporation of science in the 1855 preface to *Leaves of Grass*, along with the engagement with science in that work, suggests that critical interest in Whitman's ecopoetics must be attuned to the natural sciences that concurrently were developing their own proto-ecological ideas at the time. In fact, Whitman extends his interest in that science beyond concepts and theories, showing an interest in methodologies of natural science—how it knows what it knows. I argue that Whitman's incorporation of the natural sciences follows into how he shapes the "tuft" he holds as science's final applause. The poet uses the metaphors, analogies, and structures found in the natural sciences of the time to guide the new poetics he envisioned in the 1855 preface, and thus it features as a forming principle in his free verse. In defining the characteristics of that free verse, Rosemary L. Gates states that for Whitman "poetry was rooted in language itself, as spoken in America, and not in the literary tradition that had been developed and defined in Great Britain" (547). In holding that the American bard shall be a "kosmos" elsewhere in the 1855 preface, Whitman holds that the

poetry of America will be conversant with science, and therefore the verse of America holds the language and structure of science, a ground which the present chapter explores (497).

I first turn to how Whitman constructs the epistemological relationship between the natural sciences and poetry through the poet persona in *Leaves of Grass*, mirroring the empiricism of the natural sciences while embracing one of its most exciting theories at the time, evolution. In the second part of the chapter, I turn to the influential figure of Alexander Von Humboldt, following the historiography of science proposed originally by Susan F. Cannon, who proposes that Von Humboldt's distinct philosophy toward science and immense influence during the first half of the nineteenth century demands that, in respect to science, the age be deemed that of "Humboldtian science" (4). By understanding the vision of nature that Humboldt offers, and the way he comes to that vision, I offer a more nuanced understanding of the ecopoetics of Whitman, who not only looked to science during its Humboldtian age, but figured himself as Von Humboldt's "kosmos," combining Von Humboldt's novel approach to the universe as a grand unification of diverse natural phenomena with an understanding of his new American democracy (*Leaves of Grass*, 497).

Hearing the Lecture: Encountering Science in Leaves of Grass

The keen interest Whitman shows in incorporating science into the American poetry he envisions in his 1855 preface is one that emanates from the unique position natural science held in American culture that emerged in the decades between 1830 and 1860. The historian Donald M. Scott notes that during this time "Americans not only wanted knowledge, they insisted that it be accessible to them. Knowledge was considered a public commodity. Indeed, any attempt to cut off access to knowledge was considered not only a violation of democratic theory" (801).

Scott links this attitude towards access in the name of individualistic improvement to the growth of the public lecture as a format, noting that in New York City between 1840-1860 more than 3,000 lectures were advertised across a range of subjects, with the most popular overwhelmingly being geology and astronomy (803). Acknowledging the growth of this phenomena points to the public-facing nature of empirical science in American culture at the time, with the American scientist not addressing their discoveries to define a community of competency, but instead directly to the public. Natural science was part of the cultural milieu, rather than being cordoned off as an objective separate observer as it may be popularly seen today.

Understanding the role of public lectures in the everyday life of the literate American during the time nuances the embrace of science which Whitman professes in his 1855 preface to *Leaves of Grass*. As an editor at the *Brooklyn Eagle* during the decade leading up to his poetic career, Whitman not only attended these lectures, but also reviewed publications by scientists, such as Justus Liebig's *Organic Chemistry* (1840), which would offer insights for his readership as to which lectures to attend (Gerhardt 339). The poet therefore not only participated in the public science of the time but had at least a slightly advanced knowledge of its contemporary developments, including Von Humboldt's *Cosmos* published in (1846). The public lecture, in fact, serves as the scene for Whitman's own direct engagement with the natural sciences in *Leaves of Grass*, where he describes the experience of attending an astronomy lecture in the poem "When I heard the learn'd astronomer":

> When I heard the learn'd astronomer,
> When the proofs, the figures, were ranged in columns before me,
> When I was shown the charts and diagrams, to add, to divide, and meas-

ure them,
When I sitting heard the astronomer where he lectured with much
applause in the lecture-room,
How soon unaccountable I became tired and sick,
Till rising and gliding out I wander'd off by myself,
In the mystical moist night-air, and from time to time,
Look'd up in perfect silence at the stars. (1-8)

Whitman's attendance of the public lecture complicates his championing of natural science as poetic source material in his 1855 preface. Whitman does not leap forth in exclamation at the astronomer's discoveries. How the poet persona reaches the moment he looks up to the stars at the poem's end, however, is one that offers a critical moment in *Leaves of Grass* for understanding the complexities of Whitman's epistemological embrace of science in his theory of poetry.

Throughout the poem Whitman questions whether science's established system of thinking, with its methodologies defined in empirical experimentalism, offer value to understanding the human condition. Here, the speaker confronts the scientist as a figure, an embodiment of a way of knowing within Whitman's epistemology. In starker terms, he confronts the scientist rather than just the science. Whitman's persona, meanwhile, offers the embodiment of the poet's way of knowing, positioned in this poem as a member of the audience. This set-up, scientist lecturing to poet, parallels the epistemological relationship Whitman offers in his 1855 preface, the "tufts" of the singular, defined procedures and practices of experimental science giving way to the knowledge of natural phenomena through the aesthetics of poetry by the poet,

or Whitman's persona. Therefore, "When I heard the learn'd astronomer" offers an example of the attitudes of humanistic knowledge towards scientists in the culturally embodied form. In doing so, Whitman raises a question of value for the natural sciences. The poet attends the lecture, and then asks, what to do with it?

The poet's evaluation of this question seems unfavorable to natural science. It's notable that his departure from the lecture-room is not in revelation or exaltation of its contents, but instead out of having become "unaccountable," and "tired and sick" (5). After his departure, the poet persona proceeds into the open air to encounter "mystical" nature on his own, and on his own terms, finding the "perfect silence of the stars." The implication that the poet leaves the reader within the final line being that his encounter as a being with nature itself is equivalent in its epistemological value as the astronomer with his scientific methodology. The way he knows his methodology for forming knowledge is through an experience with nature. The poet finds truth in beauty, rather than "the proofs," "the figures," "charts and diagrams" (3).

The poem seems to present a dichotomy—choose the scientist or the poet to understand the stars. A question one may ask then, is why the reader finds the poet persona at the scientist's lecture as the premise of the poem. If the persona seems to have come to a perfect understanding of the universe by just their observation of them, why listen to what science may offer? Surely, the persona has seen the stars before. The choice to venture into the world of the scientist indicates a choice to test the limits of their received truth from the stars. They've attended in the hope of encountering some sort of value-added form, implying that the poet persona's knowledge is incomplete, and that science may offer some more complete epistemological whole. Whether it can or not forms the question of the poem, the intrigue for the reader to attend the lecture alongside the persona, and with that persona's same skepticism. Yes, the views of the

poet and scientist remain separated in the poem's conclusion, but the relationship of the natural scientist and the humanistic artist is an entangled dichotomy. Notably, the poet ends on an ellipsis. "Look'd up in perfect silence at the stars." The persona is left still with only the observation of nature, rather than a conclusion about it. Or, perhaps, it is a conclusion. The object of the persona's observation replies with perfect silence. The knowing is a kind of unknowing, an ellipsis—a little wiggle room in the kosmos that underscores the smallness of human beings. In the parlance of Romantic aesthetics, it is sublime. By ending on a phenomenological experience without an attempt to describe it through language, Whitman again invites the reader to stand alongside the persona's gaze. The scientist's lecture causes the poet persona to look to the stars again to reach this aestheticized understanding. When the poet persona is back out in "the mystical moist night-air," they are distant from the ways of knowing science provides—it's empirical methods—but not what it knows—the stars.

In "When I heard the learn'd astronomer" Whitman's epistemology finds a complementary relationship between the natural and humanistic sciences. Both observe the natural world in order to make meaning of it for the human species. That shared affinity to construct knowledge about the natural laws governing humans is a focal concern in Whitman's poetry. He is not dedicated to asserting the forbearance of a certain discipline of knowledge so much as he is concerned that the attempts to make the "untranslatable" human being—that body and soul which "sounds its barbaric yawp over the rooftops of the world"—translatable, fail to have consequence on the human because the way they are constructed is "untranslatable" ("Song of Myself: 52"). The astronomer's knowledge is not what causes the persona-poet to leave the lecture in "When I heard the learn'd astronomer". It's not epistemology, but methodology—the graphs, charts and proofs, that leave him "unaccountable" (5). In fact, "unaccountable" is an

appropriate word to leverage what the persona is taking issue within the experimental methodologies of natural science. The persona holds that prizing strict experimental methodologies in constructing knowledge, natural science severs the knowledge from its meaning. In a more classical philosophical paradigm, it offers knowledge without wisdom. The natural sciences compile information through empirical experimentalism, but that information lacks consequence on how the human subject ought to exist in the world. The charts, numbers, and proofs only blur and hide that wisdom, and so knowledge is produced but not understood. Knowledge is there, but unaccounted for, leaving the persona "unaccountable" in their encounter with the natural science methodologies.

Whitman underscores the experience of the knowledge of natural science becoming unaccountable due to methodology in the overlying form he gives the poem. The poem is structurally a single attempt to form knowledge about the stars, a single-sentence governed by two poetic structures within its verse that demarcate the methodology of scientist and the poet. The first four lines are devoted to natural science. Beginning with "When," they mark the lecture itself, and detail the poet's experience listening to the learn'd astronomer employ his scientific experimental methods. The second set of four lines marks the poet's departure from the lecture and breaks from the science placed in verse as a means of knowledge-making.

The anaphora of "when" to form his encounter with the scientist is one example of a structural trope found in Whitman's free verse throughout *Leaves of Grass.* In "When I Heard the Learn'd Astronomer" the anaphora generated from the repetition of "When" is used to mimic the empirical experimentalism of the natural sciences, and in this particular case is used to express a kind of tedium in the banal repetition of observation that science requires for that methodology. The astronomer's lecture tugs away at the consequence his discoveries have on the

people—the human subjects—he is lecturing. The observation by the persona is not value-free, but that is the critique Whitman is launching at science's engagement with knowledge in the poem. It doesn't recognize its own value. Yet, the tedious experimentalism continues on, trumpeted and applauded by the public audience, "I sitting heard the astronomer where he lectured with much applause in the lecture-room" (4). The scene finds Whitman using the jargon of the natural sciences in a critique of their methods. His poet persona does not tire of the astronomer's discoveries, but instead the way those discoveries are represented and brought forth—the "proofs, the figures, were ranged in columns before me" (2).

The persona's acknowledgement of the perfect silence of the stars after he encountered the data and knowledge contained in the proofs, charts, and figures is an important acknowledgment of their utility, however. In those accountable forms of knowledge which the poet states cause him to become "unaccountable," is truth (5). Yet, when encountering them the poet persona becomes "sick and tired" (5). In beholding that truth in the "perfect silence of the stars," Whitman's poet persona holds that there is beauty in science that it cannot render without the aid of the human arts. Thus, the poet steps in, and in carefully constructing language in verse—that is aestheticizing it—translates the knowledge of science to experience, and thus unifies and mobilizes the laws of the natural world to the cultures that arose out of it. The single strand of knowledge sought through the poem, to understand the human subjects' relationship to the cosmos, is reached by aestheticizing the information made unaccountable by the methodologies of science. The epistemological whole is made by combining the efficacy of the natural sciences carefully considered ways of constructing knowledge—their methodology—with the artist's concern with translating knowledge into human experience. The two offset

disciplinary approaches reconcile with each other in transforming knowledge into wisdom. The poet willingly looks to science as a measure to co-produce knowledge of the natural laws.

Accounting the Unaccountable

In his consideration of the natural world in his poetry, Whitman shows an additional care to amend the experimentalist methodologies of the natural sciences to aid in the co-production of knowledge between the natural sciences and humanistic sciences. He is sanguine toward the empiricism used by science and its promise for revealing truth and building knowledge is seen in. In departing from traditional poetic forms, Whitman seeks his own kind of experimentalism to understand the same objects of inquiry as the natural sciences. In giving form to his free verse, he looks to the experimental characteristics of natural science's methodologies he marks in "When I heard the learn'd astronomer". The anaphora found in the first four lines of that poem, which here offer a way to critique the tedium of the natural sciences' methodologies, are embraced elsewhere in Whitman's own poetic consideration of the natural world. Here, that anaphora is a key formal structure of how Whitman constructs knowledge about the natural phenomena around him. For a prominent example one can consider Whitman's examination of the leaf of grass his persona undertakes in "Song of Myself: 6,"

> A child said *What is the grass?* Fetching it to me with full hands,
> How could I answer the child? I do not know what it is any more
> than he.
>
> I guess it must be the flag of my disposition, out of hopeful green

stuff woven.

Or I guess it is the handkerchief of the Lord,
A scented gift and remembrancer designedly dropt,
Bearing the owner's name someway in the corners, that we may see
and remark, and say *Whose?*

Or I guess the grass is itself a child, the produced babe of vegeta-
tion.

Or I guess it is a uniform hieroglyphic,
And it means, Sprouting alike in broad zones and narrow zones,
Growing among black folks as among white,
Kanuck, Tuckahoe, Congressman, Cuff, I give them the same, I
recieve them the same.

And now it seems to me the beautiful uncut hair of graves. (1-12)

The rhetoric in this passage marks a departure from the deductive modes that poetry often participates in to understand natural phenomena. Whitman decides on empiricism from the start. The persona answers the child's inquiry, "*What is the grass?"* with a ready admission of ignorance, "I do not know what it is any more than he." (1-2). The position the persona takes toward their object of inquiry looks to build an understanding by observation. Starting from a

single point of the natural world, the organism of grass, Whitman sets out to compile information while simultaneously putting that information into terms in which they show the consequence on his persona, the human being.

The simultaneous nature of knowledge gathered and converted to wisdom is an example of Whitman partaking in the co-production of the natural and humanistic sciences. Characteristic of his urgent poetic attitude, he is tasked with forcing the epistemological gap to close through sheer force of language and poetic mastery. That urgency is seen in the characteristics he attributes to the organism the passage is devoted to observing. The grass is not limited to the leaf of grass in a literal sense, as it would be in a solely scientific inquiry. The persona is not setting out to employ natural experiments to determine the physiology or ecology of the grass for the sake of understanding those things in themselves. Instead, his observations are infused with his own metaphor for the leaf of grass as marking the confluence between the human and the natural world. While he employs the empiricism of the scientist here, his aim is extended. He seeks to understand the complexities of the organism, but also how the dynamics structuring its existence govern human existence as well. Whitman the poet employs what may be called a humanistic empiricism, observing the natural world as science does, but with more immediate conclusions on its implications to humanity. He, in other words, seeks to add wisdom to the knowledge that a purely natural scientific inquiry would yield[5].

The organism of the grass also takes on a meaning as a metaphor for the aesthetic form Whitman is using. In asking "*What is the Grass?"* Whitman is asking a question of his own poetic identity in the volume *Leaves of Grass* ("Song of Myself: 6", 1). What are *Leaves of*

[5]The distinction between knowledge and wisdom is an ever-unsettled area of philosophy, but for my purposes here I guide my understanding based on the distinction raised by Robert Nozick that "Wisdom is not just knowing fundamental truths, if these are unconnected with the guidance of life or with a perspective on its meaning" (1989, 269). Wisdom requires knowledge plus perspective on its meaning.

Grass, and what does the poet mobilizing such a question within the supposed phenomena—that of grass—mean? The moment offers one of self- reflection for the poet persona that Whitman sings in "Song of Myself," previously titled "Walt Whitman" and thus self-fashioned as overlapping with the poet in his spirit and soul. Whitman's inquiry in "Song of Myself:6" seems fully directed at abridging the creeds and schools he calls into abeyance in the beginning of Song of Myself (see "Song of Myself:1", 10) in favor of searching out a new epistemology. In posing the question to a child, Whitman pulls upon the conception of childhood developed in the Romantic period, with the child closer to the truth of nature because they stand as yet incorruptible by the woes and worries of the society. In the persona's admission that "I do not know what it is any more than he" Whitman holds that the song of experience has not offered an epistemological value over the song of innocence (3). If the goal of an epistemology is to reach truth, and for the poet that truth is beauty through poetry—the leaves of grass of Whitman the poet—then the poet persona's admission that he knows not more than the child is an attempt to reach innocence and thus the truth of nature. Whitman's poet persona wipes the slate clean. The accepted modes and forms of poetry developed by cultures steeped in their own ideologies will simply not do. His inquiry into the grass attempts to reach the child-like state of nature by experimentalism. The poem as grass suggests an inherent aesthetic quality to nature. Or at least, that to understand a facet of nature with at least a degree of separation from it (but not wholly separated), in this case being human and not grass, is necessarily an aesthetic choice. Truth must therefore pass through aesthetic, and so epistemology ends with the poet for Whitman. It begins with empirical observations, however. In them, Whitman seeks a source for his poems and himself. The question of what the grass is, is the question of where the grass springs from. With

the poem as grass, the question acts twofold: where is the source of nature? Where is the source of poetry?

To participate in empirical experimentalism, Whitman uses the same anaphoric structure found in the lecture hall in "When I Heard the Learn'd Astronomer." The phrase "Or I guess" becomes a marker for each individual stanza, and each individual observation of the grass. Each observation in Whitman's experimentalism is not a simple measurement concerning the organism, however. Instead, each observation forms a metaphor that posits how the grass' life as an organism is telling of all natural animal and vegetable life in nature, including the human species. Metaphor acts as a method to combine empiricism with humanism. The leaf of grass is a "flag of my disposition," "a handkerchief of the Lord," "itself a child," and "a uniform hieroglyphic."

After the question of "*What is the Grass?"* is raised, the persona sets out to experiment via observation in the next stanza. The first observation, that the grass "must be a flag of my disposition" makes tangible, but small progress toward an answer. Whitman's usage of "disposition" calls to mind an inherent quality to both nature and the poetry that is used to describe it. He points to the inherent quality of aesthetic as the purveyor of truth and thus, the combination of knowledge with wisdom. The observation only advances the persona's understanding slightly, however, and he must start another proposition in order to expand upon the stanza's observation. In the next stanza, the persona turns this attention to the origin presented by the school of thought that dominated Whitman's own societal moment, "Or I guess it is the handkerchief of the Lord." The capitalization of Lord suggests Whitman's specific reference to a Christian God and suggests the function of nature and its aesthetic representation

in poetry as revealing that creator's design, "a scented gift and remembrancer designedly dropt" (4-5).

The persona is advancing knowledge based on prior observations then, with no one definitive conclusion concerning the truth of the grass' representation of its place in the natural world. The advance from the question of "What is the grass?" is also telling in that it focuses the nature of that inquiry. Whitman's persona is concerned with, essentially, the origin of the grass. What does the existence of the organism in the natural world suggest about the laws that govern what exists in nature? The contents of the observations are important here in that they suggest implications on the human being's own place in that natural world. By making the observations metaphoric, there is an attempt by Whitman to understand what that information should mean for human existence. The knowledge is sought in conjunction with its wisdom.

The next stanza continues the persona's exploration but offers a rejection of the view that the grass emanated from a divine, omniscient force. The dominant cultural belief is rejected, and the same line of inquiry, towards origin, continues. "Or I guess the grass is itself a child, the produced babe of vegetation" shucks a belief in the origin of nature and its laws a divine creator in favor of a less defined kosmos (7). The "babe of vegetation." The observation holds that nature runs by a set of self-contained laws, which act to produce new vegetation. There is no directive by a single force for which intimate knowledge of an organism points to. In that observation by the persona, Whitman rejects epistemological systems which point toward poetry as mimesis of a divine truth. Beauty is truth in the observation of the grass, but that truth is one that springs from elsewhere. Where elsewhere exactly might be is Whitman's final gesture in the sequence, but instead of jumping straight there, Whitman proceeds slowly. The poem does not

proceed to conclusion in its commentary on nature-grass from this point, but instead the question becomes what that set of laws may be, and the experiment continues.

The persona is not immediately ready to embrace the notion of nature contained by its own set of laws. Instead, the next stanza seeks to review whether an epistemological system already exists that explains the origin of the grass. "Or I guess it is a uniform hieroglyphic" observes that knowledge of the grass may not point toward a singular divine "Lord" as it does in the previous stanza (6). The organism "sprouts alike in broad zones and narrow zones/ Growing among black folks as well as white folks" (9-10). The organism and where it sprouts from is a question that is posed by all humanity then, and crucially to Whitman's own political views is one that has a shared answer among all peoples. Its laws are unwavering, "growing among black folks as among white, Kanuck, Tuckahoe, Congressman, Cuff," (11). The observation that all peoples are governed by the same set of natural laws is one that I further explore in my second chapter but is important in acknowledging here because it shows Whitman's beliefs about possible epistemological systems to be singular, with one system encompassing all human and nonhuman life. Yet, the observation that the organism is a "uniform hieroglyphic" is not a conclusion for inquiry into the origin of the grass. Whitman points that there is a single way of understanding the origin of organismal life in nature which applies to humanity but does not conclude what it is. In this observation is a notion that no way of knowing developed heretofore by human cultures has fully recognized the truth contained by nature and its aesthetics.

While each of these stanzas, again doubling as observations, may seem separated, they lead to a wholly new understanding at the end of the sequence. By staring out from a single point, the persona advances knowledge slowly and by experiment, mimicking the empirical experimentalism of the natural sciences. The persona observes that the organism of the grass

exists under the same conditions of natural law as humanity, but without a system of knowledge to understand that condition available, must posit their own conclusion. Based on the knowledge gained through observation, the persona advances a new conclusion with implications for how the human species ought to understand itself. Knowledge is advanced along with wisdom.

In the next stanza, the structure of the experimental observation governing the poem's lines breaks changes. "Or I guess" becomes "And now" (12). The change in the conjunction from "or" to "and" is one that denotes a change in the direction of the knowledge-building in the sequence from expansion based on observation, to conclusion based on that expansion. Where each stanza represents an individual, separate observation, they are conjoined in a new understanding only after they have been observed, "and now it seems to me the beautiful uncut hair of graves." After starting from ignorance—a question—Whitman reaches a new understanding on the "leaf of grass" through individual observations. These all appear wholly aesthetic, metaphors used to reach another metaphor. Thus, his experimental form, imported from the experimentalism of natural sciences, is employed to give the poet an aesthetic form to comment on the truth of what one specimen of nature means. "And now" does not mark a definitive conclusion either. The poem does not end with a solution that the grass "is the beautiful uncut hair of graves" (12). Whitman's persona specifically calls attention to the present experience of the wisdom he has worked towards, "now." The conclusion here is not so important as demonstrating how the poet may work with the natural sciences methodologies to form knowledge about a single object of observation. The gesture that the conclusion of the experimental procedure is informed from observation, but not a definitive truth, is one that harkens back to the perfect silence of the stars in "When I heard the learn'd astronomer." Whitman's use of the empirical experimentalism from the natural sciences is positive in that it

reaches a conclusion that underscores for the persona the immensity of nature and its laws, and the smallness of the organism, including the human, in its system. By using the empirical experimentalism of the natural sciences in structuring the aesthetics of his poetry, Whitman is able to begin to structure an epistemology that points towards the ability of the natural and humanistic sciences to work together in positive understanding of the natural world, and humans' role in it.

The Uncut Hair of Graves

"And now it seems to me the beautiful uncut hair of graves" (12). Whitman's usage of the empirical experimentalism leads him to a conclusion that understands the truth about an organism's life in death. Whitman's epistemology incorporates the natural sciences and looks to the knowledge that natural science has produced for the new wisdom concerning the human condition in his poetry. The departure of the poem from the initial conclusion it makes in "and now" shows Whitman grappling with the natural sciences of his contemporary moment, seeking to understand the consequences of evolutionary theory as it pertained to human nature. He embraces the knowledge that the natural sciences have produced and intends to understand its truth via the aesthetics of his poetry. With form, Whitman alludes to the function of his rhetorical experimentalism, adhering to a principle that would become integral to evolutionary as it progressed from its infancy in Darwin and Whitman's time—form is correlated to function.

The truth that Whitman reaches from his experimentalism is one that places an emphasis on the life of an organism being in constant relationship with death. The grass is the uncut hair of "graves." In that assertion, Whitman rejects what his observations suggested in previous stanzas. The grass' life originated in the death of other organisms. Whitman looks to the grave as the

source as a fervent statement of materialism. Here is a distinguishing feature that separates him from previous Romantic poets such as Emerson, who suggest that this truth contained in nature and poetry transcends the natural world to reveal its ordained balance by some non-material hand.

The emphasis on materialism that Whitman reaches is one that relies on a notion of temporality that extends beyond an organism's life. The culmination of an organism is descended from the life of past organisms. The grass stands uncut but attached to the grave, a statement of its origin in some other default state of being—death. The grass' origin is material, rather than ordained by some transcendental realm. This stark conclusion becomes the focus of the remainder of "Song of Myself: 6", with Whitman invested in parsing the connection between being and not being, life and death. That departure marks an extension of the conclusion Whitman draws at the end of the experimental form found in the first stanzas of "Song of Myself: 6" His grass is a step toward a departure from the dichotomy between life and death, which he outright claims in saying that "The smallest sprout shows there is really no death" (26). Throughout the poem, the connective tissue leading to this new understanding is also material, being the literal tissue of the living organism.

The culmination of life through past organismal life directs the temporality of Whitman's materialism as progressive. In "This Compost" he sets out on a meditation that parallels in more detail the relationship between life and death Whitman raises in "Song of Myself:6". Indeed, decay serves as a powerful liminal process in the connection between past and present throughout *Leaves of Grass*, as I discuss in the next chapter. In the compost Whitman observes in "This Compost" he finds that all organismal life follows the logics he attributes to the grass in "Song of Myself: 6". "Perhaps every mite has once form'd part of a sick person—yet behold!"

he begins before surveying other nonhuman organisms “The resurrection of the wheat appears with pale visage out of its graves,” “the new-born of animals appear, the calf is dropt from the cow, the colt from the mare,” “Out of its hill rises the yellow maize-stalk, the lilacs bloom in the dooryards" (18-29). In the cycle Whitman describes, Whitman asserts that “the summer growth is innocent and disdainful above all those strata of sour dead” asserting a logic to the progression of life from death. In the decay of a single organism, the material to reform new life from death is undefined in its nature. Not wheat, or maize, or cow, or lilac, it appears as simply compost. Yet, the life that develops from the compost is definable, asserting a progression through the life cycles that sees nature taking materials from the past to drive new life forward. There is a connection through the compost, life defining itself over the strata of time.

The grass in “Song of Myself: 6” acts as a particularly potent example of Whitman’s understanding of the temporality used in producing nature as he merges the understanding of nonhuman life to human life. The organism of the grass continues to serve metaphorically, becoming the “uncut hair” not only of graves but also of the human body, “Tenderly will I use you curling grass, It may be you transpire from the breasts of young men...It may be you are from old people, or from offspring taken soon out of their mothers’ laps” (7-9). The dynamic, that the human from offspring, to youth, to elderly sprouts the grass of death, is one that mirrors and contains the same natural law as that which governs the grass as an organism. *Homo sapiens* are contained by a natural law that seems to sprout out of the accumulated matter of graves. Out of the compost. All species then, are the uncut hair of graves. In “Song of Myself: 6” the compost contains humans, pointing to a new wisdom derived from the knowledge in the experimentalism of the first part of the poem. The human is deeply materialistic, made of the same stuff as the grass and anchored in the same laws. In Whitman’s understanding of

temporality though, that means being unanchored from one temporality as an organism. By tracing the hair from the “breasts of young men” to “old men and mothers,” and to “the offspring,” Whitman completes a reproductive cycle, connecting one life to another, supposing that death melds into life, and that one bodies death is traceable in the life of another. The final line of “Song of Myself: 6” underscores a newfound faith in the steadiness of this new meld between life and death, “All goes onward and outward, nothing collapses, And to die is different from what any one supposed, and luckier” (31-32). Whitman’s expressivist optimism directed at the subject of death is on full display here. The persona is comfortable a complication of the dichotomy between life and death by asserting that the death of one organism is breathed into the life of another, and so while life in nature is materialistic in that it does not guarantee a higher order of being, it is unbound by the fear that one holds towards their own existence that it is anchored the experience of a specific time.

In “Song of Myself: 6” the wisdom Whitman reaches concerning the shared materiality of life between his persona and the grass hinges on the likeness of grass to a specific bodily feature, hair. Material life arising over great expanses of time and connected to previous life is one that shows Whitman’s influence from the knowledge the natural sciences of his time were contemporaneously building in evolutionary theory. In focusing on Whitman’s treatment of the trait that the grass becomes metaphor for in the human hair, one traces the history of life found in vestiges of organisms that are currently living. My focus here is not concerned with how accurate Whitman’s understanding of natural science was. Rather, I demonstrate that the natural sciences are incorporated into the aesthetic of his poetry by taking specific formal structures and concepts and revealing their impact on the poem’s subject.

It is important, however, to trace Whitman's understanding of evolution and how it changed throughout his lifetime. Other scholars have already weighed in on the crucial point of which parts of evolutionary theory Whitman seems to focus on in his poetics, often associating him with a specific theory of evolution and its theorist. Henry Gershenowitz, for example, classifies Whitman as a Lamarckian, arguing the poet not only had direct exposure to Jean Baptiste Lamarck's theory, but also that its place in the social circles Whitman engaged in as an editor and early poet showed him adopting the theory as a triumph of natural science in championing true understandings of nature[6]. The two principles of Lamarck's thought that he describes as being traceable in Whitman's poetry include, "1) the development of effectiveness of organs are proportional to the use of those organs; and 2) everything acquired or changed during an individual's lifetime is preserved by heredity and transmitted to that individual's progeny" (35-36). Harry Gershenowitz's evidence for this in Whitman is directed at a passage from "Song of Myself: 44", where the poet "supports" Lamarck, "Before I was born out of my mother generations guided me, / My embryo has never been torpid, nothing could overlay it" (37). The lines do echo the unfixed temporality of biological development in Whitman formulation of the compost, pointing to how life of an organism is traceable in the close attention to the traits of their progeny, such as the grass in "Song of Myself: 6". The tenets of evolutionary thought, the idea that development in nature takes place over durations of time that extend beyond one lifetime, or even multiple lifetimes, or in Gershenowitz's appraisal, are "immense"—is a key factor in Whitman's understanding of the nature his poetry is bound by and meant to form a way of knowing.

[6] Gershenowitz echoes a view expressed first by Joseph Beaver in *Walt Whitman: Poet of Science* (1951) and David Charles Leonard in "Lamarckian Evolution in Whitman's 'Song of Myself'". Both authors regard Whitman's evolutionary thought as a secondary influence derived through Ralph Waldo Emerson, whereas Gershenowitz shows Whitman engaged with science through science, asserting a more direct understanding for the poet.

The realization of the immense scale of evolutionary time is not, as Gershenowitz asserts, unique to Lamarckian evolutionary thought, however. Evolutionary time in Lamarck's thought is one that followed central developments in evolutionary thought but was one that Darwin also held as central in *The Origin of Species* (1859). Precisely because time forms such a central role in the understanding of evolutionary development makes it a shaky proposition to brand Whitman explicitly as Lamarckian, especially given the contested nature of evolution in science during the course of Whitman's lifetime. The debate between Darwin and Lamarck is one that is beyond the scope of this project but is well-covered in the history of science.[7] For understanding how their evolutionary thought differed in a consequential way for understanding humanity as Whitman sought to do, one can point to one issue of the debate; what drives change in species over time? In an assessment of the two schools of thought by modern evolutionary theorists, Lamarckian evolution is described as marked by the belief "that evolution is driven primarily by non-randomly acquired, beneficial phenotypic changes, in particular, those affected by the use of organs," as opposed to Darwin's belief which "assigned a greater importance to random, undirected change that provided material for natural selection" (Koonin and Wolf, N.p.). A Lamarckian view holds that organisms can, in effect, create their own biological destiny, implying a degree that evolution takes place in discreet, directed steps across time. A Darwinian view, in contrast, holds that evolution is not a straight directed path but that instead organisms survive across time through a series of random developments of traits that may sometimes double-back on each other, stop at one point in time and begin in another. The time it takes to evolve is not confined to an organism's actions, but instead to the will of an unwavering set of natural laws that selects for fitness in certain environmental conditions.

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[7] See Gillespie's *Charles Darwin and the Problem of Creation*, 1971.

The dichotomy between Lamarck and Darwin's driver of evolutionary change lies in which entity is acting on the other—nature and the organism in nature. In Lamarckian evolution, the organism changes by acting in nature, and in doing so acts upon nature. The classic example from Lamarck, the giraffe evolving a longer neck because of the neck's utility in reaching higher leaves, implies that eventually, the organism's actions will change the composition of the ecosystem because of the giraffe. Simply, there will be fewer leaves higher up. The organism will overtime exert agency on its environment. Darwinian evolution, in contrast, holds that the trait is selected for by nature. In *The Origin of Species* (1859) Darwin writes, "All such changes of structure, whether extremely slight or strongly marked, which appear amongst many individuals living together, may be considered as the indefinite effects of the conditions of life on each individual organism" (31). The giraffe in Darwin's view, cannot move evolution to grant them the ability to reach the leaves. Instead, nature selects for the trait of taller necks, and eventually the mean average length of neck in giraffe's becomes such that they can reach the higher leaves. The process works on the tree too, with individuals with their leaves further up the trunk surviving and the mean height off the ground of leaves becoming higher. Nature under these Darwinian laws strikes a balance by selection.

Where the mechanism of nature by which species evolve over time according to science is found in nature is one that can be distinguished as seemingly directed by nature, and thus errs towards Darwin's less agency-centered approach. Whitman's description at the end of the first sequence in "Song of Myself: 6", "the beautiful uncut hair of graves" gives one a readily identifiable trait that may be traced for its selection through Whitman's ultimate object of insight in the poem, death. The consideration of a trait like this is one that is followed by Whitman's persona in the poem. In a turn from his exploration of the grass, the persona turns to comment on

the tongue, “O I perceive after all so many uttering tongues, / And I perceive they do not come from the roofs of mouths for nothing” (21-22). The lines show the persona again taking conscious decisions towards their methodology in the poem, asserting a belief in the trait, or body parts, ability to act as an object of observation for the organism’s whole relationship to life and death overtime. The trait indicates something, in other words, about that organism’s evolution.

The uncut hair of graves, the grass itself, is that trait. Following the establishment of the trait’s passage through reproductive cycles from the breasts of young men, to old people, to offspring “taken soon out of their mothers’ laps,” the persona devotes its inquiry to the actual trait of the grass as it appears, “The grass is very dark to be from the white heads of old mothers,/ Darker than the colorless beards of old men” (19-20). The persona here confronts that the grass in its regenerative manifestation, does not appear in the same form from the organism from which it came. The metaphor of grass as uncut hair is woven as close as ever to make this observation. The coloration is surely a comment on the vitality of the grass as an organism, a unrestrained expression of vivacity from one life cycle to the other. That the coloration deepens with a regeneration suggests a kind of adaptation towards fitness, towards the coloration of life—the deepening hues of green. The grass of one generation—their experiences in life in Whitman’s humanistic thinking—becomes the unheralded key to success of the next generation. Nothing collapses because that uncut hair of graves is not lost. The trait of the uncut hair of graves is, however, a metaphor, and so does stand in for the whole human realization of a lifetime. The uncut hair of graves is selected for. The whole of past human experiences as a species is selected for then, pointing to a Darwinian understanding of selection by nature that highlights the poet’s optimism toward the immutable and uncontainable cosmos of the human soul.

This, of course, appears in contrast to the general understanding of the process of Darwinian evolution as somehow cruel by its randomness in selection by nature. It seems in "Song of Myself:6" that Whitman celebrates the necessary connective tissue that binds humans together under this process, however. His persona is but one manifestation, a specimen, in a process that by selection requires a certain amount of connection to progress. It is a grand project by nature, that binds the species together across certain categorical societal distinctions, such as class. Hence, Whitman celebrates the human as a complex project of nature progressing across great expanses of time, but always progressing.

That Whitman considers the connection between the present life of an organism and past organisms of the same type as driven by a set of natural laws does not categorically make him a Darwinian. That would be a hasty claim, and one that would require an aim different than this project. Whitman's poetry imports the key modes of thought from Darwinian evolutionary thought to understand the human condition through his poetry. He was conversant with Darwin's work, and took up the mantle of understanding the consequences of evolutionary thought on his culture's dominant ontological understanding of itself through the orchestrated aesthetics of his poetry. Evolutionary theory during the time period makes an especially ready example to be found in Whitman's work for illuminating his incorporation of contemporary scientific theory in his poetry on account of its place as the preeminent development of the life sciences at the time. In an early account of science's influence on nineteenth century poetry, the historian William Irvine highlights (1959) that Darwin's influence in the generation of poet's to which Whitman belonged after the first big push of Romanticism is not surprising, "Romanticism was making everyone biology-minded" (616). More recently, Worster writes that Darwinian evolution was "the most foundational shift toward scientific ecology during the first half of the nineteenth

century" (101). As a consequence, Darwin's theory of evolution placed in the ecopoetics of Whitman is one that underscores how interconnected Whitman's view of the natural world was with the life sciences dedicated to their study at the time. Near the end of his life in 1894, the poet would even declare to literary executioner Horace Traubel that "Leaves of Grass is *evolution*" parlaying that the answer to "*What is the Grass?"* posed in "Song of Myself: 6" was, for Whitman, one deeply influenced by the most pertinent scientific theories of his time (129).

Having illustrated how Whitman infused the natural sciences into the themes and poetic verse of in *Leaves of Grass*, I now turn to the figure of Alexander Von Humboldt, who's philosophy of science defined the age in which Whitman engaged with the natural sciences, and for which his recognition of the interplay between biotic and abiotic factors anticipated the concepts of ecosystems and plant communities that are central to ecocritical readings of Whitman's work.

Nature's Order: Alexander Von Humboldt's politics at the origin of ecological thought

Near the end of his life, Walt Whitman would declare himself "the greatest poetical representative of German philosophy" (Whitman Ed. Furness, 236)—an embrace uncharacteristic of the poet who declared "The United States themselves are essentially the greatest poem" (*Leaves of Grass,* 489). This affinity for the intellectual tradition of the other nations is found in a paralleled crisscross with Alexander Von Humboldt's own reflection on his life, who considered himself "half an American" as he looked back on his own work over his lifetime (Walls, 1). In considering the latter's influence on the former, the anecdotal crisscross of self-identity, Whitman to German Romantic philosophy and Von Humboldt to American republicanism provides intriguing grounds to enquire about the historical context that Whitman

and Von Humboldt shared in the first half of the nineteenth century—a period marking a pivotal turn in Western philosophical thought that not only affected the realm of the scientific and literary, but also the relationship of these entities to each other. Having highlighted Whitman's epistemological embrace of the natural sciences in his poetic philosophy, it is now worth closely examining the Humboldtian science that forms a key forming factor in Whitman's exploration of the vivid physical phenomena of the natural world.

Whitman's commitment to German Romantic philosophical influences is one that is found in some of the most fundamental characteristics that run through his poetic work, such as his brazen self-contradiction in how he characterizes his singular pronoun, "I", declared emphatically in "Song of Myself: 51", "Do I contradict myself? / Very well then I contradict myself, / (I am large, I contain multitudes.)" (6-8). The "I" that contains multitudes in *Leaves of Grass* shows a poetic commitment to creating a co-extensive "whole" which follows Schlegel's assertion that "it is equally fatal for the mind to have a system and to have none. It will simply have to decide to combine the two" (56 in *Philosophical Fragments*). Whitman's personal pronoun is steady through *Leaves of Grass*, but the self-contradictions found through its attempts to know espouse a something akin to Keats' negative capability in that it holds that a human subject's potential for knowledge may be defined by what they do not know as verisimilitude.[8] The "I" of *Leaves of Grass* embodies a poetic incarnation in the sublime nature of experience and subsequently, existence, which Romanticism held as an emphasis point. The grounding Whitman's persona takes in this German Romantic tradition is especially interesting in considering Von Humboldt's influence. The only point where Whitman identifies the noun that

[8] Keats' definition of negative capability was formulated in a letter in 1817, where he commented that the brilliance of Shakespeare was that he could render "uncertainties, mysteries, doubts, without any irritable reaching after fact and reason". I use Keats as an example here as the philosophical roots of the concept extend to the same German Romantic tradition Whitman is drawing on. see *The Letters of John Keats*, ed. by H.E. Rollins.

the pronoun "I" stands in for in *Leaves of Grass* directly calls upon Von Humboldt, in "Song of Myself: 24", "Walt Whitman, a kosmos, of Manhattan the son. ("Song of Myself: 24", 1). In a dissertation focused on defining Whitman's persona, Ward P. Welty argues that "the persona as 'kosmos' is the central metaphor of [Whitman's poetry]" building unity out of varied natural phenomena, spaces, and temporalities (80-81). That Whitman links the persona he grounds in German Romanticism to the work of Von Humboldt is one indicative of that the full scope of that influence includes Von Humboldt's scientific grounding in that same strand of German Romanticism. To fully properly place Whitman's work in conversation with Von Humboldt then requires a review of Romanticism in its influences on not only literature and art, but on the natural sciences, through Von Humboldt, as well.

The span of time covering Von Humboldt (1769-1859) and Whitman's (1819-1892) life is of particular interest to intellectual historians in that the period marks a transition in the West from the end of the historical Enlightenment to Romanticism.[9] In *The Order of Things* (1966) Foucault argues that the period marked a transition in epistemes, or dominant modes of epistemology in Western culture from the classical episteme defined by classical rationalism to a modern episteme spurred by Romanticism in which we currently reside in today.[10] In a historiographical study of Von Humboldt's philosophy of science, Michael Dettelbach shows that historians locating the transition of the natural sciences between these epistemes have shown particular interest in Von Humboldt as a proxy for science as a whole at the time, stating that

[9] For an alternative Foucault's thought that I offer here, see Sisken and Warner's more recent argument that the end of the historical Enlightenment was more a consequence of that ages own intellectual principles than Romanticism's attempts to rebuke them. See Siskin, Clifford, and William, Warner, 2010.

[10] Foucault says of this transition that Romanticism ended "Classical rationalism as the tendency to make nature mechanical and calculable". Foucault traces this to the end of an objective representation of reality, or that we can trust representation—the principle that we know in virtue of having ideas that, in this sense, represent what we know. He identifies Romanticism as an intellectual movement away from this sureness. See Foucault, 2002.

“struggles over the nature of Humboldt’s scientific work have long been struggles over the nature of science itself” (11). Dettelbach goes on to argue that an either-or dichotomy is inappropriate, that Von Humboldt acts as a transition figure, “being neither a naive empiricist, nor a Romantic idealist...the empirical philosopher was no longer to build theories, but to observe the covariation of phenomena through more or less precise instruments and languages” (17). Von Humboldt inherited the methodologies formed from Classical rationalism, but the scientist infused this empiricism with sensibilities drawn from his Romantic contemporaries.

In order to understand Von Humboldt’s place as a transitory figure in the history of natural science, I now briefly turn towards how historians of science have understood the features that define Von Humboldt’s philosophy of science in order to understand what aspects constitute the science Whitman engaged with as “Humboldtian” (Cannon, 4). Hans Eichner locates the first major movement of the natural sciences away from classical thought to the 1543 hypothesis made by Copernicus that the Earth rotated around the Sun, and argues that Galileo’s discovery of the law of inertia and Newton’s advancements in “classical” physics in the following centuries foreshadowed a dominant understanding of the world in which stuff in existence is not moved by “the divine heavens, but, to use that term again, celestial mechanics” (9). Scientific explanation began for the first time to violate the purpose it had played in Aristotle's classical conception of the scientific project, to serve as a marker for the identification of divine intelligence at work. Eichner continues, “when modern science banished final causes, a rift seemed to open between humanity and nature, physics and ethics" (11). In the place of Aristotle’s paradigm arose a mechanistic philosophy which dominated 17th and 18th century science, holding that phenomena of the world are produced not by divine creation, but by the emergent properties of the matter forming those phenomena.

In understanding phenomena by their emergent properties, induction became the dominant epistemological paradigm. In other words, natural science became empirical, a shift attributed by historians to Francis Bacon.[11] The project of those in the realm of natural history at the time became one of cataloging and describing the varied parts of nature's great machinery in order to draw conclusions about the machine as a whole. In the process, the origin of the science that would be coined a century later as ecology (in 1866 by Ernst Haeckel[12]) were sewn by figures such as Gilbert White, Carl Linnaeus, and Erasmus Darwin. The emphasis in these Enlightenment-era naturalists, however, remained on using empiricism to understand individual specimens as an object of study, rather than taking those interconnections as an object of study. In more contemporary terms, the life sciences of the eighteenth century focused on taxonomy of individual species, rather than the ecosystems of organisms. In the next section I further chronicle this distinction as it related to methodologies of botany at the time, but before that methodological focus, a further understanding of how Von Humboldt evolved the aim of empiricism in these fields is required.

In 1799, Von Humboldt set out the first major naturalist expedition of his scientific career with the French botanist Aimé Bonpland to the area of present-day Ecuador in South America. Trips of this sort were a norm for contemporary naturalists at the time, the concept being to travel to exotic (to European minds) landscapes to discover and classify the flora of the region using existing taxonomic systems developed chiefly by Linnaeus (Worster, 16). A review of Von Humboldt's epistolary before the trip reveals a scientist with motivating factors that extended beyond these contemporary practices. however:

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[11] For a historiography of Bacon's attribution as the developer of the modern scientific method see *Sessions, William A. "Recent Studies in Francis Bacon." English Literary Renaissance 17.3 (1987): 351-71*

[12] See Worster, 1994, pgs. 1, 156-157.

> I shall collect plants and fossils, and with the best of instruments make astronomical observations. Yet this is not the main purpose of my journey. I shall endeavor to find out how nature's forces act upon one another, and in what manner the geographic environment exerts its influence on animals and plants. In short, I must find out about the harmony of nature. (qtd in Sachs, 42)

Humboldtian science at its outset did not reject the empiricism championed through the eighteenth century, but his concerns show an ultimate concern for a more organic vision of unity within the natural world that owes much more to Romantic idealism. Von Humboldt's epistemological aims were novel in his historical context and show the immediate influence of his place within German Romantic circles, but the methodologies of his science inherit much from the Enlightenment. Although even here he would innovate towards his aims for creating a unified vision of nature, a point I expand on in the next section.

I have already noted that Von Humboldt had personal relationships with key figures of early German Romanticism but have yet to examine the intellectual nature of their influence. In a study of Von Humboldt's influence on Whitman, this is a very particular confluence, but a no less fascinating one. Von Humboldt, along with the figures Goethe and Schegel, stood in the immediate philosophical shadow of Immanuel Kant in their development of Romanticism in the last decades of the eighteenth century. Kant's thought toward perception is of special interest in relation to Von Humboldt, as it redefined the natural world in relation to the human that had been set out by Cartesian dualism. Kant distinguishes between the noumenal world of objects "outside" space and time and thus unknowable, and the phenomenal world of objects open to our

sense experience. In that humans belong to the noumenal world, we possess free will and therefore our phenomenal world is orderable because our minds impose that order. Kant's turn allows for sensory experience of natural phenomena to inform that order, and that order to help push toward understanding of the unknowable—our species' place within the noumena. In aesthetic practice the Romantic poets, including Von Humboldt's personal friend Goethe, cultivated and represented this experience toward the unknowable in their poetry and art as the sublime. Romanticism also drew upon Kant's work in breaking from the belief held in the West that phenomena of the sensory world were fixed and universal across time. Instead, an understanding that the human subject worked to construct order out of the sensory experience in the world opened up the possibility for one to discern changing natural phenomena as shifting in how they informed the humans knowledge of the noumena. What Kant's philosophy conciliated was the possibility the causality of natural phenomena to be God or some other creative force (i.e. simple matter), and its holding that humans have free will within the phenomenal world provided ground for the practice of science without upsetting that unknowable order of the noumena.[13]

The possibility for empirical science within the Romantic framework guided Von Humboldt's exploration of nature. In the preface to *Cosmos (1845),* in which Von Humboldt draws out his philosophy of science, he goes as far as to justify his cause according to Kant's doctrine, stating that "[Kant] is one of the few philosophers who has escaped the imputation of impiety, [and] has defined with sagacity the limits of physical explanations" (50). Von Humboldt's citation of Kant is one that frames his scientific work in the terms that I have

[13] Kant develops this conciliation of causation over two major works. In *The Critique of Pure Reason* (1781) Kant disputes the main philosophical holdings of Cartesian dualism and develops his Transcendental Idealism by distinguishing the noumena and phenomena. In *Metaphysical Foundations of Natural Science* (1786) he more fully describes how this Idealism maps onto natural scientific methodologies.

highlighted Kant's view towards nature. Von Humboldt limits the natural sciences to an understanding of natural phenomena, and in doing so exercises a similar epistemological control that Whitman shows in his co-production of natural and human sciences in his poetic philosophy. Whitman states that the scientists are the "lawgivers of poets" (*Leaves of Grass,* 498), pointing to the co-productive epistemology of the natural and human sciences, however this statement from Von Humboldt here only demonstrates a restraint in assigning epistemological control rather than an explicit endorsement of the same philosophy (although Von Humboldt's own gaze toward a co-production between the natural and human sciences is discussed further in the next section).

Von Humboldt's grounding in the Kantian metaphysics of the phenomena and noumena does not constitute the whole of his Romantic influence but undergirds his aims with his science. That influence is also seen in the preface to *Cosmos* (1845), such as in Von Humboldt's own definition of his object of study: "Nature considered *rationally,* that is to say, submitted to the process of thought, is a unity in diversity of natural phenomena; a harmony, blending together all created things, however dissimilar in form and attributes; one great whole animated by the breath of life" (24). "Unity in diversity" is a calling card throughout *Cosmos* for the motive of Von Humboldt's work. Von Humboldt seeks in his science the conciliation of causality that Kant offers in his philosophy of nature, but instead of orienting the self to God, in Kant's philosophical noumena, Humboldt orients the self to the Earth, the phenomenal world from which one can understand the kosmos. That orientation strikes a familiar Romantic tone, searching for philosophical and moral truths in the contemplation of nature. Again, however, Von Humboldt does not claim that natural science itself can illuminate those truths. It may,

however, illuminate phenomena from which humans may reach those understandings, which directs one back to Whitman's own attitude towards his project in conjunction with science.

The epistemological control Von Humboldt exhibits in not championing science as an all-encompassing system of knowledge is one that when examined further endows him to Romanticism. He holds a place for the experience of nature without any scientific inquiry, saying that mere attunement to the natural world provides

> a sensation, which is wholly independent of an intimate acquaintance with the physical phenomena presented to our view to establish the unity and harmony of this stupendous mass of force and matter, to determine with impartial justice...and to analyze the individual parts of natural phenomena without succumbing beneath the weight of the whole. (24)

The sensation Von Humboldt points to is one that echoes the aesthetic of the sublime recognized and philosophically developed by Romanticism. Von Humboldt holds that one may reach the understandings at the philosophical ends of his science, recognizing the stupendous "unity in diversity" of natural phenomena," without his empirical science. By stating that the individual parts do not succumb under the weight of the whole, however, he champions the possibility for the knowledge of science to bring one to the experience of the sublime, conciliating his empiricism with the Romantic project. Considered historically, Von Humboldt modified the empirical science of his predecessors to create a clear philosophical purpose for the natural sciences, grounded in and influenced by the Romanticism that he intellectually and personally engaged with at the outset of his scientific career.

Von Humboldt's *Cosmos (*1845*)* marked the culmination of his vision to create a "general physics of the Earth," an empirical science that sought nothing less than the synthesis of atmospheric, oceanic, geologic, proto-ecological, and cultural phenomena into a definitive epistemology (22). Historians of science have since held that this guided natural science in the first-half of the nineteenth century, with Cannon dubbing the age that of "Humboldtian science," in recognition that "the great new thing in professional science in the first half of the 19th century was Humboldtian science, the accurate, measured study of widespread but interconnected real phenomena in order to find a definite law and dynamical cause" (4). As natural science developed away from Classical epistemic rationalism with Von Humboldt, he infused it with clear Romantic influences that Whitman shared in his poetic philosophy. When Whitman turned towards Humboldtian science then, he found perfect philosophical affinities from which to build a poetics which was attuned to the vivid unity of the physical phenomena of the Earth, becoming the "kosmos" to "incarnate the geography and natural life and rivers and lakes" of the American Republic (*Leaves of Grass,* 490). How Whitman incorporated "Humboldtian Science" is the focus of the next section, in which I show how Von Humboldt implemented the praxis of his philosophy of science, introducing to the discipline of botany a "plant geography" which in its focus on interspecies relationships helped form Whitman's own conception of vegetation in his poetry.] In the following chapter, I argue that by forming the basis of Whitman's understanding of science in his formulation of the idealistic American poet, Humboldtian science became the basis for the poet's own political ecology as it applied to his democracy.

Von Humboldt's Plant Geography: Humboldtian Science's Botanical Methodology

Von Humboldt's *Cosmos* (1845) figures as an ambitious endeavor to unify much of his own previous scientific findings from across the disciplines of the natural sciences into a complete physical description of the universe as he knew it. The three volume work builds upon innovations in methodology Von Humboldt had already made throughout his lifetime that exemplify his philosophical aim to create a general science that found unity in the diversity of nature. Of these previous innovations, Von Humboldt's development of his "plant geography," a new methodology in the field of botany is notable for its influence on the field and as an example of Von Humboldt's philosophy of science applied to disciplinary innovation (Jackson 596). Von Humboldt developed his plant geography during a five-year expedition to South American between 1799-1805 with the French botanist Aimé Bonpland. The surveys of the botanical life of the Andes detailed in the resulting *Essai sur la géographie des plantes* (1807) (trans. *Essay on the Geography of Plants*) mark a shift in the history of botany as a science primarily concerned with taxonomy of a certain classification of life (plants) to one that would seek the underlying mechanisms involved with individual physiology of plant species, and their interaction among each other in regionally unique clusters of "vegetation" (Nicolson 290). In the methodology's attention to interspecies interaction and implicit understanding that individuals were acted upon by both abiotic and biotic influences in the environment, Von Humboldt's plant geography is recognized by Worster as an important turn in taxonomic thinking that stemmed from Linnaean classifications of individual species in the late eighteenth century, and began to connect the sinews of species interaction together in the proto-ecological sciences (121).

The historian of science Malcolm Nicolson provides an account of the innovative work Von Humboldt did in the field of botany over a series of papers charting the development of

plant geography from taxonomical practices of the eighteenth century to the introduction of ecology as a formal scientific discipline in the mid-nineteenth. Nicolson explains that the methodology of botany in the mid-eighteenth century was concerned primarily with identification, with the classification of species into higher taxa a goal represented in "species lists, or catalogues of all plants present in a given area" (168). The Swedish botanist Linnaeus acts as a figurehead for this taxonomic system, with his *Philosophia Botanica* published in 1751 a prevalent example of the conclusive form that empirical botany took during the time period. *Philosophia Botanica* (1751) is a material example of the textual form empirical science took during the eighteenth century, filled with endless listings of species according to the then novel (and still currently widely used) Linnaean taxonomy system from Kingdom to phylum, class, order, family, genus and finally species. The beginning of the chapter on the plant kingdom, for example, is organized according to a strict format which aims to classify based on observation of external phylogenetic features, "III. Plantae, 78. Vegetabilia, 1. Fungi" (57). The brief example is one that reflects the objective of the botany in *Philosophia botanica*—the classification of individual plant species, rather than the phenomena of several species in a shared environment together and the dynamics of that environment. Nicolson distinguishes the two objects of study as flora versus vegetation, with the characteristics of vegetation "not produced not only by the presence and absence of particular species, but by different growth forms of the constituent plants and their relative abundances" (168).

Vegetation, Nicolson argues, was the focus of Von Humboldt's botany.[14] In shifting the focus from flora to vegetation, Von Humboldt seeks out the abiotic and biotic factors that govern

[14] Von Humboldt again here draws upon Kant, who in his work in *Universal Natural History and Theory of Heaven* argues that the essence of knowledge is not systematizing according to arbitrary conceived logic individual objects, but instead in description of phenomena as they actually exist and coexist in the phenomenal realm. The understanding of the immutable laws of nature is found, for Kant, in the interrelationships of objects to each other in

the interrelationships between otherwise taxonomically (but not environmentally) isolated species.[15] In generating knowledge from the study of the plant kingdom, Von Humboldt took vegetation *en masse* as the object of study, and focused the discipline on searching for the environmental and geologic factors that suggested why an individual species may grow where it grows among other plants. In heralding this "plant geography," Von Humboldt states that "observation of individual parts of trees or grass is by no means to be considered plant geography; rather, plant geography traces the connections and relations by which all plants are bound together among themselves" (Von Humboldt, 100). Plant geography would exist largely only in name for Humboldt until after his first expedition to South America between 1799-1805. In *Essai* (1807), he would highlight both the holistic emphasis on vegetation rather than individual plants, begin to recognize region as a unit of natural phenomena, and postulate that his object of study mediated between the natural world and human society:

> The man who is sensitive to the beauties of nature will still find there the explanation of the influence exerted by the appearance of vegetation over Man's taste and imagination. He will take pleasure in examining what is constituted by the 'character' of the vegetation and the variety of sensations it produces in the soul of the person who contemplates it. These considerations are all the more significant because they are closely linked to the means by which the imitative arts and descriptive poetry succeed in acting upon us. The mere appearance of nature, the panorama of fields and woods produces a pleasure which

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the phenomena. Nicolson quotes a passage from Kant's work "The infinity of creation encompasses in itself, with equal necessity, all natures that its overwhelming wealth produces. From the most sublime class among thinking beings to the most despised insect, not one link is indifferent to it; and not one can be absent without the beauty of the whole, which exists in their interrelationship...everything is determined by universal laws which nature effects by the connection of its originally implanted forces (297).

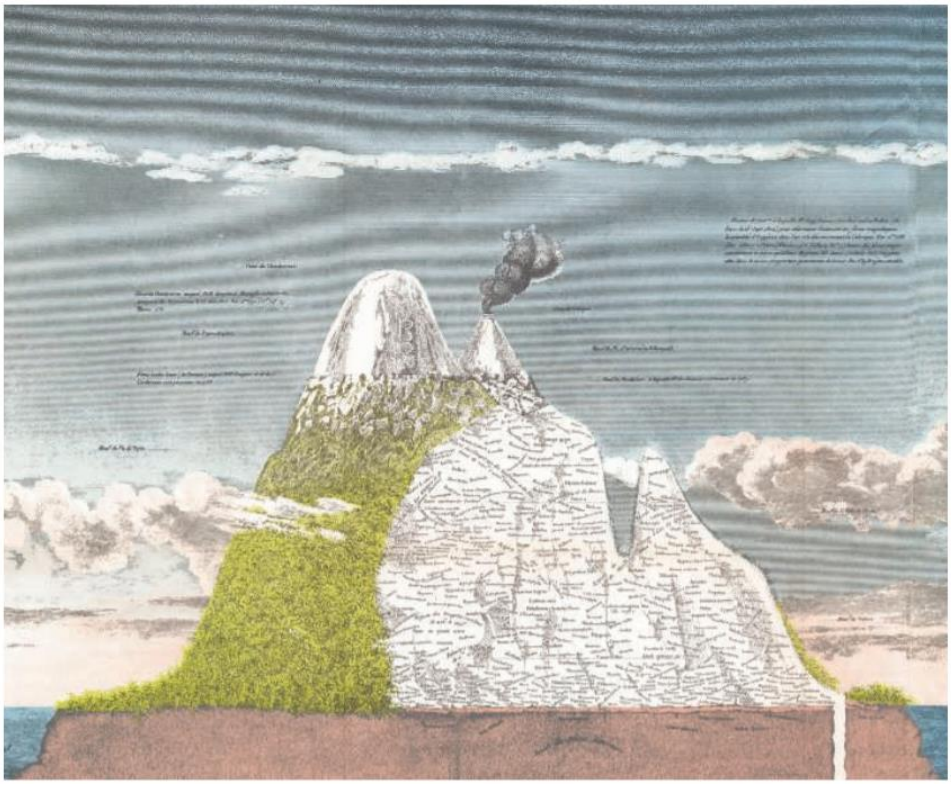
[15] The shift towards forming taxonomies based on factors in the environment, rather than in the individual species itself, is identified by Worster as a key moment in proto-ecological thinking, see Worster, Donald, 1991, pg. 78.

> is essentially different from the impression produced by individual study of organic being. Here it is detail which interests us and excites our curiosity; in the first case, it is the whole, the masses which stir our imagination. ...What a marked contrast between forests in temperate zones and those of the equator, where the bare slender trunks of the palms soar above the flowered mahogany trees and create majestical portico arches in the sky...How does this bearing, this appearance of nature, rich and pleasant to a greater or lesser extent, affect the customs and above all the sensibility of people? (qtd. in Nicolson 177).

Vegetation for Von Humboldt not only colored the aesthetic sensibility of the human cultures found within different regionalities, but in close observation and consideration of the interrelations of the unique species of a region scientifically in their *en masse* allowed for the humanistic sciences to more carefully define the character of a specific group of people or culture. Von Humboldt's plant geography was envisioned with a full view of its applications for the humanistic sciences to co-opt and produce knowledge based on its findings. Where his poet contemporaries considered landscape via pure experience, Von Humboldt figured the empirical science of vegetation as a way to more carefully understand that experience of the phenomenal—a landscape with more accurate hues, per se.

The focus on landscape was one Von Humboldt took to praxis, with the centerpiece of his *Essai* containing an engraving, "Tableau physique des Andes et pays voisins" (trans. "Physical table of the Andes and surrounding countries) that showed a cross-sectional profile of the Andes from the Atlantic to the Pacific at his latitude in Ecuador. In the interest of briefly illustrating

Von Humboldt's own reconciliation of the natural and humanistic sciences, I've included it here (qtd. in Jackson, 596):



Above: Von Humboldt's "Tableau physique des Andes et pays voisins", which was a fold-out insert in his *Essai sur la géographie des plantes* (1807) (qtd. in Jackson, 596)

While the *Tableau* may not appear a Romantic masterpiece akin to Friedrich's *Wanderer Above the Sea of Fog* (1818) it is an artistic landscape that 1) is scientifically significant, and 2) incorporates Romantic aesthetics designed to impart a sense of the sublime. The former point is seen in the identification of vegetation zones, climatic zones, and individual plant species in the cross-section. It accomplishes this in a landscape where the Andes—one of Earth's largest mountain ranges—dominates one visual plane. Though a human subject is not figured into the engraving, the sense of scale for the viewer is one that is immense in not only its scale but its complexity. Von Humboldt nods to the scale, along with the climatic conditions of the Andes,

including stylized depictions of clouds wrapping the mountain range. Where Von Humboldt's philosophy of science's contribution to the aesthetic understanding of nature is in the indiscernible visual representation of the taxonomy of plant species. The viewer confronts the sublime not only in scale, but also in the complexity of natural scientific attempts to understand that landscape. Humboldt's plant geography, and natural science, helps to color the landscape, but the increase in human knowledge does not escape the phenomenal realm. Instead, the natural sciences aid the human sciences in reaching for the aesthetics that make humanity's small place in the kosmos starkly apparent.

Von Humboldt's *Tableau* seeks to converge the contributions of the natural sciences and the aesthetic arts in producing a knowledge of the unified phenomenal. As natural science diverged from the arts in the early nineteenth century, the polymath showed a commitment to not only showing the unified systems of nature in the kosmos, but also the unified epistemological commitment by humanity across the natural and humanistic sciences to approach understanding of the human species within that unified system. Separate from the human species but governed by the same law of the kosmos, the study of vegetation was a phenomenal replica of the natural law that governed all of nature, including our human species. Von Humboldt's emphasis on the interrelationships of life to abiotic environmental factors and to other biotic forms of life was a focus of botany going forward, and its focus on analysis of the connections between organisms and their environments in a unified system defined the age of Humboldtian science. The realization is important in that Whitman's gaze toward science as a source for understanding the complexities of nature was one toward a scientific institution that, at the time, was defined by Von Humboldt's ideas. Von Humboldt's science, for its part, showed an interest in meeting that gaze, and so the two figures were both concerned with unifying then diverging disciplines of

knowledge. Von Humboldt was nearing the end of his life when *Leaves of Grass* was first published in 1855, and had already withdrawn from his life as a public intellectual, leaving no direct thoughts from Von Humboldt about Whitman identifying in his eponymous poet that as "Walt Whitman, a kosmos, of Manhattan the son," ("Song of Myself: 24", 1). Whitman's poetics, then, shows a deep interest in taking not only identifying with the "kosmos," but exploring them on Humboldtian terms (Sachs 111).

Whitman's Study of Vegetation

I have already discussed Whitman's interest in the properties that grass offered as a rich center of symbolic resonance for his multi-dimensional identify and his new organic poetry grounded in the earth in "Song of Myself: 6," but I will now expand on Whitman's specific interest in the flora that accompanied the depiction of vegetation that features throughout *Leaves of Grass*. Whitman's interest in flora provides both confluences with contemporary Romantic and Transcendental interest in plant matter for its symbolic resonances, and a distinguishing aspect of his poetry that shows his particular keen interest in the natural sciences of his historical moment. Whitman was interested in vegetation for its abilities to illuminate philosophical and moral truths, but he was equally as intrigued by its vivid physical presence, and the ability of empirical natural science, especially botany, to offer space for his poetics to combine the two. As Reynolds points out, the use of "leaves" rather than "blades" in the title *Leaves of Grass* clearly draws from the science of botany, which at the time was newly energized by the development of proto-ecological paradigms of which were directly descended from Von Humboldt's plant geography (241). That subtle linguistic hint to Whitman's interest in the scientific study of plants is one that guides the meaning of the flora and vegetation found throughout *Leaves of Grass* and

shows his influence from Von Humboldt's innovations in botanic methodology with his "plant geography." Reynolds points out this botanical influence, without full attention to its Humboldtian methods. Having discussed Von Humboldt's development of plant geography, I now provide an account of Whitman's specific Humboldtian influence in depicting flora.

One major moment in *Leaves of Grass* cited as invoking Whitman's interest in the knowledge science brings to organic phenomena and processes—such as decomposition and the interrelationship of animals to plants—is "This Compost." Christine Gerhardt identifies the poem's examination of compost with the science of Chemistry, writing that the speaker in the poem not only "simply exclaims 'What Chemistry!' but adopts the outlook of a science that was as crucial for the time's environmental reform as it was for the twentieth-century understanding of food chains and energy flows" (341). Maria Farland suggests a much more pragmatic origin for Whitman's scientific interest in decomposition in the poem, stating that "preoccupation with decaying organic matter was hardly an abstraction-it was quite possibly the single greatest concern of New Yorkers and other urban dwellers in these years," and arguing that the conclusions the poem reaches about life springing from "sour dead" ("This Compost," 10) are both a celebration of urban life, and the efforts by public health officials to understand human decomposition and how to manage it (800). Both readings identify Whitman's faith in the capability for the natural sciences to produce positive knowledge for utility in understanding both the immediate present time and the unknowable immensity of time as a construct. The speaker's gaze in the poem, however, is decidedly toward the products of the decomposition process of interest to other scholars—the "herbs, roots, orchards, grain" (8). Whitman's persona may conclude about the chemical processes of decomposition in the poem, but that conclusion is

one that relies on a primary inquiry that firmly belongs to the discipline of botany, and analysis of that discipline's current methodology derived from Von Humboldt.

The origin of this inquiry in the poem stands in contrast to the enthusiastic embrace of the unknown that Whitman's persona elsewhere exhibits in his poetry, such as "Song of Myself: 6" where he ponders with a child, *"What is the Grass?"* Instead, the beginning of "This Compost" finds Whitman's persona uncomfortable among its usual bucolic settings, "Something startles me where I thought I was safest, / I withdraw from the still woods I loved, / I will not go now on the pastures to walk," (1-3). Whitman's persona is troubled by the philosophical or moral knowledge that these landscapes hold, especially in the mold of Romanticism, and so intends to withdraw elsewhere for knowledge. What exact phenomena troubles the persona turns out to be the beauty of those landscapes—the woods and pastures—which Whitman beholds, despite his knowledge that the growth of these environments relies on "distemper'd corpses" and "sour dead" (9-10). In the following stanza, the persona again exhibits the structure of an empirical study, posing questions concerning "how can it be that the ground itself does not sicken?" (6). The ground which the perona asks this inquiry of is not barren, however. Instead, it is populated specifically by plant life "How can you be alive you growths of spring? How can you furnish health you blood of herbs, roots, orchards, grain?" The object Whitman's persona wishes is the vegetation, *en masse*, which activates in him an hypothesis about mortality as it relates to decomposition.

"Behold this compost! behold it well!" exclaims the persona, as it details flora in relationship to their specific appearance in different parts of the landscape of vegetation that is studied (17). "The grass of spring covers the prairies, the bean bursts noiselessly through the mould in the garden," joined onions, apple-buds, willow and mulberry trees, and the "resurrection of the wheat appears with pale visage out of its grave" (20-24). Whitman defines

the geographical environment he is inhabiting via the survey of its species, following Von Humboldt's own botanical methods. In doing so, the persona beholds animated vegetative life, but does not discount that it "rises out of what was once a catching disease" (41). The persona comments on this in the conclusion of the stanza where it conducts the survey of the flora contained in the vegetative landscape, "The summer growth is innocent and disdainful above all those strata of sour dead" (30).

The line echoes Von Humboldt's conclusion about the physical and historical pattern seen in the study of the decomposition process of plants to form a intermix of vegetation "thus one organic tissue rises, like strata, over the other: and as the human race in its development must pass through definite stages of civilization, so also is the gradual distribution of plants dependent on definite physical laws" (214). Whitman's use of "strata" further shows the poet framing his inquiry of vegetation in relation to science of the time by incorporating its linguistic practices into his poetic practices. Likewise, Von Humboldt identifies metaphorical resonance of the same conclusion reached via natural scientific study, likening the one vital organic whole from disparate dead organic matter to the progress that human civilization makes. The Humboldtian metaphor is particularly remarkable in that it states that there is one singular physical law dictating this progression of human society and the composition of the vegetation he studies, asserting that the non-human and human may be understood in the same unified system. By reaching this conclusion, Von Humboldt demonstrates the driving belief of his plant geography, that by studying the animated vegetation *en masse* one can determine definite physical laws governing all of nature, including humans.

The reaction of Whitman's persona to this understanding is animated with emotion in "This Compost." The embrace of "What chemistry!" noted by Gerhardt as an embrace of

scientific thinking is one that directly translates into an embrace of the persona's own materiality and place as the organic live whole out of the strata of the dead. Whitman uses his persona to act as the embodiment of the realization that the physical laws of the vegetation observed and his human are one in the same, while celebrating the interconnectedness of the environment that this unified natural system requires. The persona is at ease "That when I recline on the grass I do not catch any disease, / Though probably every spear of grass rises out of what was once a catching disease." (40-41). Disease acts as an extended metaphor through the stanza, with the persona celebrating the abiotic factors of the environment that dictate the vegetation he finds himself in the same unified nature with—"the winds are really not infectious" and "this transparent green-wash of the sea which is so amorous after me, / it is safe to allow it to lick my naked body all over" (32-33). The "chemistry" that Whitman's persona embraces is decidedly anticipatory of the concept of the ecosystem, and even gestures toward an ecological position for the human, with the persona finding himself as part of the vegetation rather as a separate observer.

Gerhardt notes that beyond these ecologically anticipatory realizations, the poem also demonstrates a nuanced eco-ethics as well, stating that "despite its enthusiastic response to recent scientific developments, [the poem] avoids gestures of epistemological control" (341). As in the observation of the "perfect silence of the stars" in "When I heard the learn'd astronomer" Whitman still commits to the inability for any form of knowledge to truly lead to a complete knowledge of existence. In "This Compost" he directs this willing acknowledgement towards the environment his persona derives its knowledge from: "Now I am terrified at the Earth" (42). The combination of the natural and human sciences may portray and reach near complete understandings about natural phenomena, but still some essential mystery remains.

Chapter II: Humboldtian Science and Whitman's Political Ecology

I listened to the Phantom by Ontario's shore,

I heard the voice arising demanding bards,

By them all native and grand, by them alone can these States be

Fused into the compact organism of a Nation ("By Blue Ontario's Shore", 1).

Reading any selection from Whitman's *Leaves of Grass* requires a multifaceted critical approach to the poet pursued over the last century and one half. In the selection above, for example, one can pick out the epistemologically positive relationship Whitman holds with the natural world—a relationship drawing the attention the ecocriticism developed over the last thirty years to the poet.[16] One can also turn to his meta-discourse on his own poetics, "I heard the voice arising demanding bards," fodder for readings concerning Whitman's own desire to make himself the poetic representative of American democracy.[17] Still also one can look at this in relationship to those bards task to fuse "these States," Whitman's favored way for referring to his American republic, into a Nation—attention for historicist readings of the "Chants Democratic" sequence from which this excerpt opens in the third edition of *Leaves of Grass* (1860), in the context of the build-up to the American Civil War.[18] Pursuing each critical strand Whitman as a poet separately, however, seems to contradict his own beliefs concerning his poetry. Whitman is

[16] See M. Jimmie Killingsworth's *Walt Whitman and the Earth* (2006), and Christine Gerhardt's *A Place for Humility* (2014.

[17] This project is one that defines the poetic theory in Whitman's 1855 preface to *Leaves of Grass*, where he inaugurates the American poet as one unbound by other traditions and set "to enclose old and new for America is the race of races. Of them a bard is to be commensurate with a people" (490).

[18] see Moon, Michael. *Disseminating Whitman*. Cambridge (Mass.): Harvard UP, 1991.

the poet who sings chants at random, embraces his own contradictions, and jumps from time and space quickly and demands that his readers take that same approach in reading the result. In following his self-figuration that the American poet was tasked to enclose and manifest the geography and natural life of the Republic in his 1855 preface, he states that "the largeness of nature or the nation were monstrous without a corresponding largeness and generosity of the spirit of the citizen" (490). Whitman seeks to form a national poetry then, but one that reflects his reader and the "teeming geography, the nation of nations" that composes his American Republic (491). Having discussed Whitman's epistemological incorporation of Humboldtian science into the vivid natural phenomena he studies in his poetry in the previous chapter, I now turn to how these natural considerations were put to service Whitman's poetic project to construct his democratic vista of his American Republic. In doing so, this chapter considers the relationship between the natural, the political, and the poetic which Whitman fuses together in his poetry, and offers the consideration that the ecology noted in Whitman's poetics is 1) a political ecology, and 2) one that positions natural science as an institution that in democracy is deeply engaged with public politics, rather than acting as an objective arbiter.

In considering Whitman's "political ecology," I import the term originally developed in the last twenty-five years in the fields of human geography and anthropology, where it has developed as a sub-field to understand environmental change in a landscape as a result of power relationships between humans (Robbins, 3).[19] Using this term, I develop a framework for understanding Whitman's relationship to the natural environment of the North American continent as having shaped his vision of democratic vista, and do so on the poet's

[19] Robbins does not advance a specific definition of political ecology intentionally in his own meta-review of how the term has been defined, but does gesture towards one in stating that the goal is "to understand the complex relations between nature and society through forms of access and control over the environment" (7).

epistemological terms discussed in the previous chapter—incorporating the methodologies and knowledge developed in the natural sciences of the time. As explored in the previous chapter, reading Whitman's political ecology predates such an institutionalized separation between the realms of scientific and cultural knowledge. For Whitman empirical science was never separated from the questions of building a more perfect society, and a more perfect society in turn was informed by a particular view on empirical science. Beyond simply celebrating science and its discoveries, Whitman saw the end of its empirical path, the theories generated concerning the natural world, as ways to understand American democracy. The Humboldtian belief in the mutual dependencies of nature—of flora on fauna and on climate—shaped Whitman's understanding of political hierarchies—of the rich on the poor, of the merchant on the farmer, of the oppressor on the oppressed, and of the human on the natural. Whitman's political ecology does so in relation to that Humboldtian science which defined science in the historical moment Whitman wrote.

The lines above from "By Blue Ontario's Shore" offer a short example of the triangulation between the natural, political, and poetic that I explore in this chapter. In it, Whitman's persona encounters the natural by engaging the ecosystem of Lake Ontario, here personified as a phantom to point to its sublime wisdom garnered over time spans not understandable to the human. This experience of the ecosystem is one that must be "fused into the organic compact of the Nation" referring to the process of seeing the mutual dependencies of the unique geographies of the American continent fused into a vital form of politics, American democracy—echoing Von Humboldt's view towards geography, and the abiotic and biotic factors that define all life in the environment.

Who is a Kosmos: Whitman's persona and Humboldt's Kosmos

In the previous chapter, I identified the shared philosophical roots that Whitman's persona shared in German Romanticism with Von Humboldt's philosophy of science. In describing his persona, however, Whitman extends beyond shared influence to identify with Von Humboldt's work, describing the persona as "Walt Whitman, a kosmos, of Manhattan the son," in "Song of Myself: 24" (1). That poetic moment, the first time Whitman identifies the noun denoted by his singular pronoun "I", is small in the long arc of *Leaves of Grass,* but crucial in that it sees the poet himself inhabiting the "kosmos," narrowing the broader Romantic influences in his persona into a specific influence in an idea taken from Humboldtian science. That active embodiment of the "kosmos" is echoed in Whitman's formulation of his poetic project in the preface to the first edition of *Leaves of Grass*, writing that "The American bards...shall be a kosmos" (497). The 1855 preface suggests that the American poet must actively become the unity in diversity that marks Von Humboldt's scientific aims, and importantly, does so with the specific notion of creating a unique national poet. In Whitman's poetic theory, the ideal of the kosmos is mobilized to define a politics through the poet, suggesting that Von Humboldt's natural philosophy is central to Whitman's democratic politics. The moment is one that inaugurates Whitman's poetic project as one deeply concerned with a political ecology defined by Humboldtian science. The identification of the persona "Song of Myself: 24" suggests that Whitman himself manifests his poetic theory, having become "a kosmos" (1). The ecopoetics of *Leaves of Grass,* is defined by this persona, self-fashioned as a kosmos, exploring the vivid physical phenomena of not only an environment, but one that is distinctly informant of the American republic that persona belongs to as a citizen.

"Song of Myself: 24" acts as a meditation on Whitman's own vision of what becoming a kosmos entails. Whitman's first line is devoted to the delocalization of his natural being from its place of origin. He is the offspring of Manhattan but unable to be constrained by that sociopolitical identifier in becoming the American poet, instead becoming dislodged from a specific geography and being able to grasp the unity of all natural phenomena. Whitman is adamant in grounding his persona in physical phenomena, further describing his persona in the next stanza as stuff of basal biological material order— "Turbulent, fleshy, sensual, eating, drinking and breeding, / No sentimentalist, no stander above men and women or apart from them, No more modest than immodest" (2-4). Once placed firmly in the realm of the material, the persona then defines the physical phenomena as informing politics, echoing the first line of the strophe, "I speak the pass-word primeval, I give the sign of democracy, / By God! I will accept nothing which cannot have their counterpart on the same terms" (10-11). The persona then posits that through him can be heard the voices of the "prisoners" and "slaves," "thieves and dwarfs," and connects them to "rights of them the others are down upon," citing the "deform'd, trivial, flat, foolish, despised, / Fog in the air, beetles rolling balls of dung" (24, 12-19). The persona also directs that he shall explore his own self in service of understanding the kosmos, "I keep around the bowels as around the head and heart, /Copulation is no more rank to me than death is" (23-24).

In proclaiming that his persona is a "kosmos" in "Song of Myself: 24", Whitman directs his own poetic project to examine material phenomena for their natural laws precisely because his kosmos is unified by diversity in that phenomena. By having become the kosmos, Whitman asserts that the study of his own internal being and external phenomena are connected, and are so in the service further understanding the complexities of natural law to perfect his democracy.

Engaging with Von Humboldt's Kosmos

Though I have demonstrated Whitman's Humboldtian scientific influence in the previous chapter, and am not alone among literary critics in doing so,[20] it is worth pausing to consider that Whitman's choice to self-fashion himself as a "kosmos" was one that within his historical context was not recognized as directly having a Humboldtian influence. A contemporary review by the critic Charles Eliot Norton of the first edition of *Leaves of Grass* published in 1855 expresses frustration over the vague nature of the term, "That [the author] was one of the roughs was also tolerably plain; but that he was a kosmos, is a piece of news we were hardly prepared for. Precisely what a kosmos is, we trust Mr. Whitman will take an early occasion to inform the impatient public." (Norton, N.p.) Another review from the *Literary Executioner* published in 1856 seems to identify Whitman's kosmos more with a kind of original, more-gritty, version of the brahmin American transcendentalist, rather than any serious attempt to engage with the ideas of a well-regarded scientist like Von Humboldt, "this kosmos is a compound of the New England transcendentalist and New York rowdy" (*The Literary Executioner)*. Given Whitman's own professed embrace of science in the first edition *Leaves of Grass*, this contemporary commentary appears as an odd complication to modern criticism of the "kosmos" I've pointed to in Whitman's poetic project and its direct relation to Von Humboldt's work. Whitman's response to his contemporary critics would come in the third edition of *Leaves of Grass*, published in 1860, which includes the first edition of a poem that seeks to elaborate on the term, "Kosmos." In this poem Whitman more directly identifies heuristic for his use of the word as Von Humboldt, and in doing so confronts the scientist not only for his science, but for his cultural legacy. Holding

[20] Reynolds writes that "Whitman's sense of 'kosmos' was deeply influenced by Humboldt...if Humboldt uses the word to present a theory of the earth and the heavens, so too does Whitman" (245).

Von Humboldt's work as a scientific work immediately relevant to his cultural moment, Whitman directs science's place in politics—of which his were fiercely concerned with American democracy.

Whitman's "Kosmos" first appeared in the 1860 edition of *Leaves of Grass* under the "Autumn Rivulets" cluster, an eclectic mix of poems buried after clusters that bear more clear thematic coherence such as "Drum Taps" and "Remembrances of Abraham Lincoln." The poem not only seeks to expand on the theory of the "Kosmos", but also offers a rare explicit intertextual moment in *Leaves of Grass*, celebrating the literary aspect of the accomplishment of Von Humboldt's volume. Whitman creates this intertextual moment by hinging the title, "kosmos," as a dual-signifier, referring to both the material work of Von Humboldt—his published book—and the scientific work of Von Humboldt—the theory of kosmos for which Whitman's persona identifies with. A notable instance of Whitman's use of anaphora to structure a long single-sentence, the title "Kosmos" is the singular subject of the poem, with "who" beginning each line to highlight a different aspect of that expansive concept. The first description found in line one is the most succinct of these lines, and also the most direct in its praise, "Who includes diversity and is Nature." In describing the kosmos, Whitman jettisons his favored present progressive tense[21] is favor of an active voice defined in the present tense. This tense pervades the poem, and elsewhere the "kosmos" "contains believers and disbelievers," and "holds duly his or her triune proportion" (1,3-5). To hold that Whitman's "kosmos" is Nature speaks to Whitman's faith in the all-encompassing unity of Von Humboldt's theory of the kosmos, and his trademark confidence that his persona speaks with complete attunement to these phenomena in the natural world. That unity, capital-N "Nature," contains diversity, which

[21] For a humorous and subtle nod to Whitman's association with the present-progressive see Langston Hughes celebration of the poet in his poem "Old Walt."

parallels a passage in which Von Humboldt's own assertion of what his study of the kosmos reaches found in his preface to *Cosmos,* as quoted in the previous section. Whitman's persona expresses an understanding of Von Humboldt's own conception of his kosmos then, with the linguistic parallels showing an understanding of that kosmic theory on Von Humboldt's terms (filtered, as it were, through E.C. Otté, Von Humboldt's English language translator). Combined with the contextual evidence I have pointed to elsewhere, the description calls for a reading of the poem with the understanding that the kosmos Whitman's persona defines and celebrates in the poem is at least, in part, a definition and celebration, in poetic terms, of the scientific achievement of *Cosmos* as a work of scientific literature.

The expansion from the opening line "contains diversity and is Nature," is one that finds Whitman's persona mixing a celebration of the aesthetic qualities of Von Humboldt's *Cosmos* with his own definition for the persona *becoming* that theory through poetics. For example, in line five the kosmos is "who holds duly his or her triune proportion of realism, spiritualism, and the aesthetic or intellectual" (5). The choice of the adjective "triune" suggests an appreciation for Von Humboldt's aesthetics, where *Cosmos* provides a balance of realism and spiritualism in conveying both knowledge of aesthetic and intellectual value. The use of triune also suggests Whitman's celebration for the kosmos as a theory of nature, with the adjective most commonly associated with the Christian triune in Whitman's time[22], the holy spirit three-in-one. By using the term, Whitman offers *Cosmos* (1845) as the text which contains a theory of nature ascendant, after Whitman's persona calls upon the suspension of the dominant Christian creed in his "Song of Myself: 1," "Creeds and schools in abeyance" (10). In this passage, the scholar Diane Kepner states that "[Whitman] thinks both scientists, as practitioners of materialism, and priests, as

[22] The OED does note that the etymology of "triune" refers to "of the Godhead; also, of heathen deities," but its entries surrounding Whitman's lifetime are almost entirely in reference to the Christian tradition.

practitioners of idealism, have made erroneous assumptions about the truth of our Being and about its relation to the visible world" (186). His praise of kosmos as a theory, however, suggests that Von Humboldt's conciliation of materialism to inform the idealistic is one that answers the theory of nature Whitman seeks. Whitman's praise of Von Humboldt's aesthetics to communicate its theory of nature is one that answers an anxiety expressed by Von Humboldt in *Cosmos,* regarding his abilities to convey his natural science work in language that may do justice to the grand scale of connection he recognizes in natural phenomena,

> [*Cosmos*] exalted part is to show the simultaneous action and the connecting links of the forces which pervade the universe...The higher the point of view, the greater is the necessity for a systematic mode of treating the subject in language at once animated and picturesque. (54-56)

Whitman finds that Von Humboldt achieves a holistic description of the mutual dependence of the constituent parts of nature in a manner that is given just weight linguistically, and therefore acts with his poetry in a synchronous matter to offer a true theory of nature found in *Cosmos*, a kosmos.

It is kosmos, as a theory of nature, which Whitman asserts is Von Humboldt's great accomplishment for it as a complete system of knowing— "Who, out of the theory of the earth and of his or her body understands by subtle analogies all other theories" (7). Whitman again points to natural science as the underlying impetus for knowing, holding that in studying natural phenomena for phenomenological laws, there follows an intimate knowledge of human affairs— be it "The theory of a city, a poem, and of the large politics of these States;" (8). The latter line is

an important moment, linking Von Humboldt's theory of the kosmos to the way Whitman understands the politics of American democracy. The moment is not one Whitman adds as an addendum to Von Humboldt's theory. Von Humboldt's own understanding of his kosmos as a theory of nature is one that implicates how humans organize themselves in political system:

> We may find among all nations a certain vague, terror-stricken sense of the all-powerful unity of natural forces...We may here trace the revelation of a bond of union linking together the visible world and the higher spiritual world. The two become unconsciously blended together, developing in the mind of man, the first germ of a *Philosophy of Nature* and nations. (*Cosmos,* 37)

While Von Humboldt states that his kosmos, in revealing the overwhelming unity of nature, offers only the first step towards a full-fledged political theory—a philosophy of nations—the sense that drives the movement towards the organizing of human politics is an intriguing one.[23] Von Humboldt states that understanding the full extent of the unity found in natural phenomena is a terrifying experience for the human subject—a sublime one. Whitman's persona recognizes this as the ultimate end of the theory of the kosmos, with his poem ending with an appreciation for just how far the bounds of the unity Von Humboldt holds in his theory of the kosmos extend, "Who, constructing, the house of himself or herself, not for a day but for all time, sees races,

[23] Von Humboldt was a proponent of the ability of his science to direct political reform during his lifetime. Laura Dassow Walls provides an account of Von Humboldt's affinity for American republicanism as fashioned by Thomas Jefferson and the ability for his science to aid in the harmony of Jefferson's small-scale agricultural political union. *See A Passage to Cosmos.* Aaron Sachs, critiques postcolonial readings of Von Humboldt, arguing that Von Humboldt ought to be read with as much attention to his social awareness of the impacts that natural science had on political ideologies. Sachs argues that while Von Humboldt was certainly a bourgeois European male set to explore and classify, his version of being a naturalist included properties that "can be seen as the first step toward the development of a humane ecology—a socially conscious science with a humanistic, but not human-centered, approach" (119).

eras, dates, generations, / The past, the future, dwelling there, like space, inseparable together" (10-11) Whitman alludes to what Von Humboldt holds more explicitly, knowing the full connection of the kosmos forms the impetus for the formation of ideological systems that attempt to confront that sublime unity. The requirement for a perfect political system then, is to match the kosmos' unity in earnest, a directive which Whitman's persona, in being a kosmos, assigns as the full potential—yet to be met in Whitman's view—of American democracy. The full extent of Whitman's realization of American democracy through Von Humboldt's theory of the kosmos is the focus of the next section.

Before venturing into Whitman's full development of a political ecopoetics using the kosmos, however, it is worth pausing to consider the historical contexts that surround Whitman's conception of kosmos found in "Kosmos", as they bring to light how pressing the idea that political unity was formed from, and ideally matched nature's unity. As I noted previously, Whitman's response to the definition of kosmos in "Kosmos" was first published in the third edition of *Leaves of Grass*, which appeared on the eve of the civil war in 1860. Rosemary Graham writes that the third edition began a subsequent pattern of Whitman's editions of *Leaves of Grass* checking the idealism characteristic of his early editions against the realities of the civil war and Reconstruction. The third edition represents Whitman's attempt to "keep the Union together by sheer force of language" (Graham, 12).[24] Given this, the political implications that Von Humboldt alludes the kosmos directs in *Cosmos* are vital to Whitman's own understanding of the theory contained in the word "kosmos." The chaos brought to existing societal hierarchies

[24] Whitman's personal interest in the unfolding events of the early Civil War are detailed by Ted Genoways in *Walt Whitman and the Civil War*, where he marks a stark shift in Whitman's focus on the war being one that between 1860-1862 was concerned with the political implications of the struggle, and then a period after his brother George was wounded at Fredericksburg in 1862 where he began to grapple more with the profound horror that entailed the reality of war.

by the war may have even made the messy unity of the kosmos even more attractive to Whitman as a concept. As the critic Peter Coviello writes, "the war made for enormous alterations in what we might think of as the intimate terrain of national life: in relations that is, not merely between North and South, but between women and women, men and men, and women and men" (270). Coviello's criticism highlights the war as a watershed moment for Whitman's understanding of sexuality, however, his overarching point that the war created a space to reimagine American society (even as it historically had just been imagined) creates an interesting perspective by which to judge Whitman's theory of nature. Whitman chose to continually and fully adopt the kosmos as the theory of nature underlying his perfect ideal of democracy through and after the civil war. As a vehicle for idealizing democracy, Von Humboldt's kosmos may have been muddled by the crisis of succession in the build-up to the civil war, but certainly did not lose its idealistic appeal for Whitman.

That Whitman continued to hold this ideal is evidenced by his major prose work on politics in *Democratic Vistas*, published after the civil war in 1871. Here he holds that the essence of "democracy" lies in allowing the identity of the kosmos to be freely represented as a right,

> There is, in sanest hours, a consciousness, a thought that rises, independent, lifted out from all else, calm, like the stars, shining eternal. This is the thought of Identity—yours of you, whoever you are, as mine for me...In such devout hours, in the midst of the significant wonders of heaven and earth, (significant only because of the Me in this centre,) creeds, conventions, fall away and become of no account before this simple idea. Under the luminousness of real vision, it alone takes possession, takes value... The

> quality of BEING, in the object's self, according to its own central idea and purpose, and of growing therefrom and thereto—not criticism by other standards, and adjustments thereto—is the lesson of Nature (36).

To cultivate democracy for Whitman means to cultivate the rights that are guaranteed to the human according to their being a part of Nature, which Whitman earlier holds the kosmos is. The establishment of democracy as a political philosophy entails each constituent person meeting the scale and unity of the kosmos in themselves, with a democratic governance then perfectly reflecting the laws of the kosmos found in each individual—in each singular identity. The idea of citizenship becomes one in which the individual rises to the scale of the sublime unity of the kosmos. As Whitman writes in the 1855 preface to *Leaves of Grass,* "The largeness of nature or the nation were monstrous without corresponding largeness and generosity of the spirit of the citizen" (490). In the next section, we turn to how Whitman employs this political theory of nature in envisioning the realizations found in *Democratic Vistas* in America. In doing so, my attention is to how Whitman deploys the epistemological frameworks Von Humboldt forms his theory of nature from, using the methodologies of plant geography discussed in Chapter One to show Whitman's realization of his political ecopoetics, an attunement to nature developed in order to realize his ideal American democracy.

The Political Ecology of Whitman's America

Whitman's raison d'être for his poetry at the outset of his career was first and foremost to depict America not as a country, but as an actively formed idea. He sought not just to represent the nation but also to induce a sense of *nationess*, that is, to forge the very bonds of national

attachment as it circulated from reader-to-reader. Whitman sought this nationess in the natural world of the North American continent. In the 1855 preface he writes that "[the American poet's spirit responds to his country's spirit...he incarnates its geography and natural life and rivers and lakes' (491). Following this statement of purpose, Whitman further provides an extensive account of the unique geographies of the American continent, all the while asserting that from "Maine and over Manhattan bay...to over the seas off California and Oregon" the American poet "spans between them also from east to west and reflects what is between them" (491). Whitman's poetic project is to induce nationess by imparting the latent sense of natural connection of all of the North American continent's ecologies in the service of creating political unity. Having discussed how Whitman reached his own sense of attunement to nature through Von Humboldt's kosmos, and his steady commitment to the ideal of the unified theory of nature found in Von kosmos to carry out the poetic project to completion throughout his literary career, we now turn to how that theory of kosmos is deployed in creating the sense of nationess in Whitman's poetry. In reading Whitman's attention to natural phenomena in relationship to his project of nationess, I return to the idea of Whitman's political ecology—that the poet's meaning-making of nature is one that both directs and is directed by power hierarchies between humans.

To do so, I return to the third edition of *Leaves of Grass*, where Whitman first sequenced his poems using clusters as an index, a permanent feature of subsequent *Leaves of Grass* editions. The major clusters of "Calamus" and "Children of Adam" make their initial appearance in the third edition, along with already written poems gathered into stand-alone clusters such as "Walt Whitman" (later "Song of Myself") "Salut au Monde" and "Poem of the Open Road" (later "Song of the Open Road"), which became more or less fixed features of later *Leaves of*

Grass editions. Alongside these major clusters of the third edition is "Chants Democratic and Native American" which was subsequently un-clustered in every later edition of *Leaves of Grass* but contains several poems which Whitman chose to later gave stand-alone clusters to such as "By Blue Ontario's Shore" and "Our Old Feuillage." The cluster, with only a brief appearance in Whitman's literary career, is one that does not receive critical attention as a cluster then, a group of poems which Whitman places together in the edition as chants to bring forth his democracy. R.P. Hoople called the cluster a "neglected sequence" of *Leaves of Grass* in 1970, and justified the importance of understanding the poems as a cluster in that it marks the point where "Whitman was now finally working to achieve the goal of a 'Poet of Democracy,' to write his 'evangel poem of com- rades.' If tempers flared around him, he would, in his new volume, answer tempers with his own combination of gentle persuasion, anger and super ideological reconstruction of the American experience" (181). Despite this, Hoople's call to see the cluster as whole as Whitman enacting his democratic poetic project is one that has fallen flat in criticism since then, even as the major "Chants Democratic" poems have been given considerable attention under their revised names. Gary A. Culbert, for example, writes that the poem that became "By Blue Ontario's Shore" and is the first of Whitman's Chants, "Chants Democratic: 1", was one which the poet showed considerable interest in revising to more perfectly represent his theory of nature and politics, with "its importance to Whitman attested by its continual prominent position in his order of poems" (35). I turn my attention to the cluster given the already discussed historical context of Whitman's focus in the period before 1860 with testing his expressivist utopianism toward nature and nation found in early editions of *Leaves of Grass* against the realities of the geopolitics of the early-stage civil war, and that in its enactment of the

poet's vision of democracy, it is the natural world that most often the "Chants Democratic" look to in order to find the original energy and source of the politics it sings.

That characteristic reading of politics onto the ecological is found in the opening lines to "Chants Democratic: 4", later titled "Our Old Feuillage", where Whitman excitedly proclaims the organicism and unity of his America, "AMERICA always!/Always me joined with you, whoever you are!/ Always our own feuillage! (1-3). The spelling of "feuillage" shows the etymological roots of "foliage" in the French "feuille," literally leaf, which Whitman calls upon for its properties of combination, organic but dead leaves gathered into a singular organic whole with vivid potential (OED, "foliage"). The metaphor is one for politics, with Whitman figuring that America would turn the dead creeds of past nations and form them into a singular vital democracy.[25] Before exploring the properties of that image, I'll pause here to note that Whitman's usage of "feuillage" as a spelling is curious in that even within its historical context it appears as archaic. The intention in Whitman's choice of diction is one that aligns with the poet's own expressed theory of language, "the history of language is the most curious and instructive of any history and embraces the whole of the rest. It is the history of the movements and developments of men and women over the entire earth. In its doings everything appears to move from east to west as the light does" (qtd. in Warren, 57). Whitman's theory, and his intentional use of past etymological form to describe the organic progression of politics to the present American democracy he is forming, fits with the portrayal of that democracy as the fresh culmination of what has already passed. In later editions, he further makes this distinction apparent, changing the "Always our own feuillage" to "Always our old feuillage," and re-titling the poem with the line. "Chants Democratic: 4" then, is Whitman surveying and forming

[25] The OED uses a Hawthorne entry from 1850 as an example pulled from one of Whitman's countrymen.

American democracy out of past creeds and beliefs that he asserts, by the laws of nature, are connected to the American democracy he is forming. American democracy is a progression of politics, but it is not a progression into a wholly new future. Instead, American democracy is a realization of what has always been present—the natural laws of the kosmos, which Whitman highlights by using word forms that are from the past but may be read in the present.

With Whitman's treatment of temporality established, I now turn to the image of foliage to unite his collective vision of his country. Again, the image of foliage is one that is composed of individual organic leaves gathered, describing a singular whole made of the same material as the individual parts. To describe it in more ecological terms, the image is that of vital decay, with each of its individual parts death giving rise to new life. These contradictions—individual in the whole, life in death—still lead to one timeless whole. And it's this timeless whole, created through the contradictions of individual and collective, mortal and timeless, that Whitman seeks to use as the connection point between this natural image and his American republic. Through Whitman's ecopoetics, American democracy becomes the natural, timeless, way of arranging the constituent parts of the natural universe, and which in turn, ought to govern Whitman's country.

"Chants Democratic: 4" finds the methodologies of Humboldtian science used to chant the unique and disparate plants, animals, and peoples of the North American continent under the unified banner of democracy. The flora and fauna of the American continent always appear contained in the political units which contain them. Whitman defines the political frameworks of place, such as state or territory, via close attention to the individual characteristics of its ecosystem. In his extended metaphor of foliage, Whitman is picking up each leaf individually and describing its peculiarities on its own, but also in relation to other leaves, and doing so at a rapid clip. The methodology recalls Von Humboldt's emphasis on finding the grand, sublime,

scale of unity in the kosmos in the complexity of the particular, such as in his *Tableau* discussed in Chapter One. The nomenclature of place here also recalls Von Humboldt's attention throughout his scientific career as to how the unique geographies he surveyed affected the disposition and interactions of the peoples who lived there, as the historian Peter J. Bowler explains:

> geographical zones suited Humboldt because they could be understood as a biological equivalent of the nations of humanity[...] Humboldt himself had shown an interest in the native inhabitants of the regions he visited, and his views on how the environment affects plants and animals may have been influenced by his studies of the ways in which human societies adapted to local conditions (72).

Bowler's insight is one that reveals the political facing notion of Von Humboldt's own understanding of his science. The inhabitants of a particular landscape, populated by a unique set of flora, were bound to that landscape in their customs and politics. If one was to create a democracy that spanned the North American continent, they would need to reflect the sheer diversity of its natural landscapes while containing an overall sense of unity. And it is that project which Whitman's persona takes up.

Whitman does this in "Chants Democratic: 4" by closely linking the unique ecosystems of the places he surveys to follow his organic metaphor of the foliage, beginning:

> Florida's green peninsula—always the priceless delta of
>
> Louisiana—always the cotton-fields of Alabama and Texas,

> Always California's golden hills and hollows, and the silver moun
> tains of New Mexico—always the soft-breath'd Cuba,
> Always the vast slope drain'd by the Southern sea, inseparable with
> the slopes drain'd by the Eastern and Western seas, (4-6)

This initial step defines the entire grand scope of Whitman's survey, spanning the entirety of the North American continent. The initial survey is one that firmly underscores the unity of the political entities under the kosmos. Whitman traverses political entities that as of his writing in 1860 were imminently headed toward disunity, including the "cotton fields of Alabama and Texas," directly tied to the antebellum economic system of slavery and the then soon-to-be confederate states. Yet, Whitman asserts, "always" are these entities connected by their unique geographies, inseparable from the connection of all of Earth's processes ("Chants Democratic: 4, 1).

The connection of the natural world to the economic system is one that does define the geographies of the places Whitman chooses. The natural world of Florida and Louisiana are set aside as "priceless," but the defining characteristics of Alabama, Texas, California, and New Mexico are all tied to human economic systems, and ones that are extractive of the Earth's resources at that. Through economy, the ecosystems that Whitman offers here have already been touched by the politics of America, firmly political ecologies that are tied to that republic's uptake of the capitalist system. His persona does not work to condemn these practices either, a feature of Whitman's ecopoetics that may appear jarring to modern sensibilities of environmentalism. That moment is an important one to recognize in arguing that Whitman practices an ecopoetics that is political. The poet's attentions to the natural world are anticipatory

of ecological thinking, yes, tying the politics of the American continent together under the unity of nature, but they are still bound by the contexts of environmental discourses in the nineteenth century that point to nature as a source for unchecked extraction of resources for humans. Whitman's ecopoetics are not a complete solution to how humans should live in an ecology, but rather an important part of the heritage of what has formed our modern notion of what living ecologically might mean. Recognizing how he anticipates the thinking of modern environmentalism, with its full contexts in the proto-ecological sciences, is an important project in creating continuity between the past and our moment today.

In "Chants Democratic: 4", those proto-ecological sciences are apparent in the persona's own understanding of his survey of the American continent:

> The area the eighty-third year of these States, the three and a half
> millions of square miles,
> The eighteen thousand miles of sea-coast and bay-coast on the
> main, the thirty thousand miles of river navigation,
> The seven millions of distinct families and the same number of
> dwellings—always these, and more, branching forth into
> numberless branches,
> Always the free range and diversity—always the continent of
> Democracy; . . . (7-10)

Whitman enacts the skills of the modern sciences, with his persona becoming both a cartographer and a demographer in defining and observing the great mass of his States, while

celebrating their growth and diversity under that singular moniker. Furthermore, Whitman undertakes distinctly Humboldtian science, noting the diversity of ecosystems at relatively steady latitudes while beginning to recognize their interdependence. The second grouping of lines in Whitman's survey of the America as foliage highlights his willingness to draw upon the ways of knowing that owe themselves to the empirical methodology, and in doing so show a general slant towards empiricism as a way for his persona to delve into the individual leaves of his foliage, while still finding ultimate unity as a whole. That unity ends with the persona's proclamation of both the continental scale of unity, and the politics that is that unity, "always the continent of Democracy;" (10). Whitman grounds the continent of Democracy in its ecosystems, the "prairies, pastures, forests, vast cities, travelers, Kanada, the snows" tied together with "the huge oval lakes" (11-12), in a directionality that extends all ways, and a temporality that seeks to contain all times, Always the West with strong native persons, the increasing density there, the habitans, friendly, threatening, ironical, scorning invaders; / All sights, South, North, East—all deeds promiscuously done at all Times, (13-14). Whitman's treatment of temporality is one that he grounds in natural law as well. He is ahistorical in his descriptions of nature because of his observation of it—in "For Him I Sing", for example, he asserts "I raise the present on the past/ (As some perennial tree out of its roots, the present on the past)" (*Leaves of Grass*, 1).[26] In political terms, democracy arises out of the past, but with a staid connection to the natural law that drives time forward. Looking ecosystems provides a staid true realization of that democracy then, further motivating the procedures Whitman follows in his "Chants Democratic: 4".

[26] An important feature of Whitman's survey I do not discuss at length here is his treatment of the native people of the West as part of the natural environment that had to be tamed, as part of the narrative of manifest destiny, and thus as vestiges of a past wilderness that would be tamed in America. Whitman's view is summed up nicely by Rachel Rubenstein, stating "Whitman could acknowledge that Indians had been wronged and dispossessed, but at the same time he subscribed to notions of progress and continental expansion; the eradication of Indians was in service to an inevitable national destiny" (307).

Whitman's attention, however, is not only to the abiotic and vegetation that fills the American continent, but instead his "Chants Democratic: 4" also draws in the fauna, and people of the American continent. He surveys the "northerly wilds beasts of prey haunting the Adirondacks," the "sheldrake lost from the flock," and the "she-walrus lying drowsily while her cubs play around" ("Chants Democratic:4", 19-22). The attentions to fauna here are directed at coloring the full phenomena of the places the persona sings in the "Chants Democratic: 4". Whitman's persona, however, shows a special ornithological interest, of which matches the dynamics of his poetic persona's ability to survey the landscape of the American continent. Throughout *Leaves of Grass* Whitman shows a fascination with the ability of the bird to realize his vision of escaping conventional notions of place via flight. In "Song of Myself", for example, where Whitman identifies himself as a kosmos ("Song of Myself: 24", 1), the final section of the poem, "Song of Myself: 52" finds Whitman's persona finding the fullest representation of his self-figured ontology in a hawk, "The spotted hawk swoops by and accuses me, / he complains of my gab and my loitering / I too am not a bit tamed, I too am untranslatable, I sound my barbaric yawp over the roofs of the world" ("Song of Myself: 52", 1-3). The moment is one in which Whitman stands in awe of the hawk's place in the natural world. Where the poet must toil in verse to become kosmos, and proclaim it, the hawk by virtue of nature's design is a kosmos in its being. In "Chants Democratic: 4", the persona finds that "hawk sailing where men have not yet sail'd, the farthest polar sea ripply, crystalline, open, and beyond the floes" (23). Via its ability of flight, the hawk may conduct a survey by experience, recognizing the unique geographies that Whitman's persona must wrestle into language.

The hawk is important in how Whitman treats the ecosystem of "polar sea, crystalline, open, and beyond the floes", "where me have not yet sail'd". That land is known through the

hawk, and yet included in the chant of democracy of Whitman's persona. Whitman includes the uncharted geographies of the American continent into his democracy, known through the hawk, and ready to be brought into the fold of the foliage of American democracy. That the hawk, or indeed, any species can know a landscape is an important moment in marking Whitman's ecopoetics as it raises the possibility that non-human species can know the same democratic continent through their experience with nature as the human American citizen. Indeed, Whitman's persona looks to nonhumans, especially those of the avian type, to know the unity of American democracy in a way that is unimpeded by corruptible human creeds. A poignant example in the context of "Chants Democratic: 4" is found in the darting swallow, which migrates freely across the extremely politically fraught line from North to South and back again, "darting swallow, the destroyer of insects, the fall traveler southward but returning northward early in the spring" (59). The depiction of the darting swallow is followed by a remarkable moment in which the persona "takes flight", becoming for a moment not just a kosmos, but the theory of the kosmos as observed from the avian perspective,

> O lands! all so dear to me—what you are, (whatever it is,) I putting it
> at random in these songs, become a part of that, whatever it is,
> Southward there, I screaming, with wings slow flapping, with the
> myriads of gulls wintering along the coasts of Florida,
> Otherways there atwixt the banks of the Arkansas, the Rio Grande,
> Saskatchawan or the Osage, I with the spring waters laughing
> and skipping and running,
> Northward, on the sands, on some shallow bay of Paumanok, I with

parties of snowy herons wading in the wet to seek worms and
aquatic plants,
Retreating, triumphantly twittering, the king-bird, from piercing the
crow with its bill, for amusement—and I triumphantly twitter
-ing (70-75)

By singing these ecosystems from his becoming-avian perspective, the persona "becomes a part of that, whatever it is" reaching a fuller understanding of the interconnections of nature and his place within that kosmos.

Whitman's restrain in defining the article "that" is an admission by the persona that his "Chants Democratic" catalogue and survey knowable phenomena under the unity of something that is still to a certain extent, unknowable. In encountering the foliage, the persona finds only the rich fertile soil that democracy arises from, and not the full fruition of that democracy in itself. The full extent of the unity in the diversity in the American continent from which democracy rises is sublime. Whitman himself figured this into his view of American democracy, writing in *Democratic Vistas* that "the sublimest part of political history, and its culmination, is currently issuing from the American people" (31). Jason Frank argues that Whitman's ideal of democracy is a democratic sublime, writing that this sublimity arises from "the poetic depiction of the people as themselves as sublimely poetic," placing the source for the sublime aspect of America as depicted in Whitman's poetry in its people (403). The attention Whitman's persona gives to vegetation and to the fauna of the American continent to know and be democracy, however, suggests that the democratic sublime of Whitman's is reached from the knowing of the full sweep of the interconnected biotic and abiotic phenomena of America, of which the

American people part. The manifestation of Whitman's democracy is in the individual citizen rising to meet that scale—comprehending the unity of the diverse American lands. As he writes in the 1855 preface to *Leaves of Grass,* "the largeness of nature or the nation were monstrous without a corresponding largeness and generosity of the spirit of the citizen" (490). Whitman's democratic theory then, is one firmly rooted in the individual becoming a kosmos, realizing the vast interconnections of nature and the requirement to act according to them, and thus constitutes an ecopoetic directive. A directive, that amid the historical moment in 1860 in which "Chants Democratic: 4" was written, is both a radical expressivist act of utopia, and a rather defiant act of hope against the real politics of the nation at the time.

Whitman asserts "always" are the political entities connected by their unique geographies, inseparable from the connection of all of Earth's processes. After singing the connective natural laws of the American continent at length, Whitman finally reaches the conclusion that in

> Singing the song of These, my ever-united lands—my body no more
>
> inevitably united, part to part, and made out of a thousand
>
> diverse contributions one identity, any more than my lands are
>
> inevitably united and made **One identity**;
>
> Nativities, climates, the grass of the great Pastoral
>
> Plains,
>
> Cities, labors, death, animals, products, good and evil
>
> - these me, (79-81).

Whitman's survey of his foliage is complete here, winding through the plant and animal species of his kingdom in a final interwoven gesture toward what that foliage may now represent—the new American identity—composed of the timeless—the varied evolution of the plant and animal. Across latitudes, climate, flora, and fauna, Whitman finds his democracy as a reckoning with unity, a realization of the mutual dependence of land, plant, person and politics—a way of joining in with the rest intertwined, turned to material facts.

What Whitman finds in that his foliage then is a conglomeration of time and space, formed in dynamic natural flora and fauna, social positionalities, and even different linguistic expressions taken from different etymological points in a word's history. His poetics is a song, as he gladly proclaims as a unifying act in itself, "How can I but as here chanting, invite you for yourself to collect bouquets of the incomparable feuillage of these States?" (80). His survey is one conducted with careful faith in a scientific gaze, but also with careful negative capability, pursuing beauty in democracy without a sure understanding of how that beauty may present itself in American identity. His song is vital, varied, but recognizable as one whole, as real as the dirt of decomposition from all of nature's forms. What Whitman is demanding in his "Chants Democratic" is an ecological awareness that must be a prerequisite for citizenship in his American democracy. That is an ecopoetic directive, formed from an epistemological embrace of the natural science of Von Humboldt, that the poet, and indeed the land he chants, demands from us always, especially in our present environmental moment defined by the challenges of climate change and destruction of those very landscapes which Whitman sang.

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