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Religion, Science, and Truth in the Human Experience:
Poetry as Living Synthesis in Walt Whitman's *Leaves of Grass*

Karen E. Luidens

A Thesis Submitted to the Graduate Faculty of

GRAND VALLEY STATE UNIVERSITY

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Abstract

Walt Whitman's great masterpiece *Leaves of Grass* stands out in the canon of nineteenth-century American poetry for both its innovations in form and its bold ventures into controversial subjects. One such subject is the role of science as opposed to religion in shaping the modern worldview. Whitman's poetry alternately and at times simultaneously expresses both materialistic and metaphysical cosmologies, criticizing and casting away ancient traditions as often as he calls on them for inspiration.

In this paper I explore the influence of contemporary science on Whitman's worldview, analyze how its theories shape the cosmology presented by his poetry, and discuss the complex relationship between *Leaves of Grass* and the legacy of Western religion and literature out of which it grew—and continues to “grow” with each new reading. Ultimately I argue that Whitman seeks to discover and express truth in all its forms, which means engaging directly with the natural world, then embracing both the objective hard data we draw from it as well as our own subjective, even spiritual, experiences. Since neither religion alone nor science alone allows for this complex and often cognitively dissonant relationship to the world, he preaches a new way forward: poetry will offer the grand transcendent synthesis of the two, encompassing all truth and continuing to evolve as a living entity within humanity generation by generation going forward.

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I. Introduction

Walt Whitman is known as a great American poet of the nineteenth century, both criticized and renowned for his pioneering use of free-flowing verse, his controversial depictions of human sexuality, and his dotting odes to the young United States. Although it's clear that he seeks to lay out an ultimate grand vision of the world with his great life-long project *Leaves of Grass*, it's less clear whether he succeeds. Within its pages, several hundred poems sprawl across topics ranging from the bustle of cities to the devastation of the Civil War, the common folks of the Midwest to the spirituality of Eastern Asia, literal birds and bees to the Birds and the Bees. Along the oft-wending way, Whitman's persona contradicts himself on questions of materialism, mortality, and metaphysics. What, if anything, is Whitman's ultimate vision?

Specifically, what does *Leaves of Grass* have to say about the great Western debate of religion versus science? Whitman's poetry has been associated with the Transcendentalists, and it certainly has moments of rapture and intense spirituality. But these passages are repeatedly tinted with doubt and tempered by rational critique. Whitman views the world from the pinnacles of Old World religions, but also from the new towers of science and through the lenses of its microscopes and telescopes. In the last century scholars have explored Whitman's personal papers as well as his poetry itself and demonstrated beyond doubt that he was actively engaged in the many intellectual discussions of his day, including the lectures and writings of men of science. Their studies shine through the cosmologic picture painted in *Leaves of Grass*, informing poems' topics and language in ways alternately implicit and explicit.

Focusing on the final 1881 edition of *Leaves of Grass*, this paper will investigate how Whitman weaves a nineteenth-century scientific worldview into his verse and how this distinguishes it from poetry inspired by religious and mythological traditions. I'll discuss how Whitman wrestles with his own complex and often contradictory instincts about the nature of truth and whether it can be revealed through religion, science, both, or neither. Ultimately I'll explain how Whitman's *Leaves of Grass* declines to commit to a specific cosmology and instead offers a way forward for readers in the modern era who continue to wrestle with these age-old yet ever-evolving questions.

Whitman's use of scientific terminology and theories has received attention before now, but relatively little compared to other aspects of his writing. Instead, his work has been deeply studied in the context of American nationalism and the Civil War (Jason Frank, Ted Genoways), modernist experiments with form and style (Roger Mitchell), or his sexual identity and body politics (Ed Folsom, Martin Murray). Those discussions that do give attention to his nature imagery have tended to concentrate on its spiritual significance, tying him more to Transcendentalists than to scientists (David Haven Blake).

On the other hand, Whitman's passionate interest in contemporary scientific developments has been demonstrated by a variety of scholars over the years. P.Z. Rosenthal examines his frequent use of mathematically precise descriptions in his early writings (pre-1855), while Clarence Dugdale and Joseph Beaver independently confirmed the consistent accuracy of his many references to celestial bodies in both his prose and poetry from that time forward. Alice Lovelace Cooke discusses the many fields of science that interested Whitman, from astronomy to geology to evolutionary biology, and along with Dugdale gives evidence of

his active engagement with practicing scientists both in person and through their publications. Together they effectively dismiss the claims of earlier academics like Norman Foerster who read Whitman's abundant nature imagery as vague and uninformed. To the contrary, Whitman's personal journals and note-keeping, his collections of newspaper clippings, and his innovative poetry are all brimming with evidence not only of his love of nature but of his in-depth and specific knowledge of the instruments, vocabulary, and discoveries of nineteenth-century experimental science.

However, the studies of Beaver, Cooke, and Dugdale do not delve deeply into the question of how these references' accuracy contributes to the poems' cosmological discussions. This is precisely what I will investigate over the course of this paper: the significance of allusions to scientific theories and discoveries in *Leaves of Grass*, how they collectively convey a love of modern and even materialistic worldviews, how they clash with nearby passages singing the praises of faith and all things sacred—and how Whitman manages to synthesize everything he writes into a work that does indeed transcend the dichotomy of religion and science.

II. Historical and Literary Context

Walt Whitman's Early Influences

There was a child went forth every day,
And the first object he look'd upon, that object he became

“There Was a Child Went Forth”

Walt Whitman was born in Long Island on May 31, 1819, as the second of seven children and the second generation of native-born citizens in the newly-minted United States of America, whose Constitutional Congress had established a stable government just three decades earlier in 1787. His father, Walter Whitman Sr., was of English blood and Puritan predilections, while his mother, Louisa Van Velsor, descended from Dutch immigrants. Throughout Whitman's childhood of frequent relocations within Brooklyn, he was influenced by his six years of study at a poor public school and his experiences of the bustling city's libraries and museums. This rich urban environment encouraged an eclectic self-education that stands in contrast to the formally structured, classical educations enjoyed by many other writers and poets of his day.

The young Whitman was also influenced by the divergent religious leanings of his elders. While neither of his parents belonged to a specific religious denomination, his mother's family had a history of Quaker involvement, particularly his maternal grandmother, Amy Williams Van Velsor. Whitman was further impressed by Quaker thought at the ripe age of ten, when he heard a lecture by the radical Quaker leader Elias Hicks. Whitman came of age at a time when Romanticism and the Second Great Awakening were sweeping the United States, movements whose freewheeling passions fanned the flames of his independent spirit and inspired him to

pursue the soul-searching that would come to define his life's work as a poet: alternately autodidactic and isolated in nature, and immersed in the intellectual conversations of the day through lectures, reading, and correspondences with some of the great scientific minds of the nineteenth century.

In order to understand Whitman's worldview, of course, we must go beyond his personal upbringing and professions to enter the scientific discussion that so attracted and inspired him.

The Science of Whitman's Day

Based on the ancient pinnacles, lo, newer, higher pinnacles,
From science and the modern still impell'd

“Eidólons”

Throughout most of human history since ancient times, societies' cosmologies have been determined by shared religious practices, often sanctified by the hallowed words of a few authorities. In Western society specifically, for some 1500 years a centralized Catholic Church taught from the accounts in Genesis that God created the world in a week's time, culminating with the design of humankind in His own image.

But when Galileo turned his telescope heavenward in the seventeenth century, the Church and its views were shaken to their foundations. Within a few rapidly-progressing centuries, astronomers Nicolaus Copernicus and Johannes Kepler demonstrated that in fact the planets follow elliptical orbits in a heliocentric solar system, displacing Earth as the literal center of a perfectly balanced universe. Building on their proofs with an ever-increasing arsenal of tools and formulae, geologists like Sir Thomas Lyell began to investigate the Earth's age and

processes of change over time, and biologists like Erasmus Darwin and Jean-Baptiste Lamarck proposed that all living creatures had evolved into being over the eons from common ancestors through a series of gradual adaptations (“Whitman’s Indebtedness” 100, 103). Religion’s reassuring anthropocentrism disintegrated further with each discovery, an unsettling reality for the well-informed members of Western society.

By Whitman’s birth in 1819, the “well-informed” class of the young United States was growing at a pace that rivaled that of the accelerating growth of scientific knowledge. A heavy emphasis on education in the 1830s and ’40s led to the remarkable literacy rate of 90 percent among white Americans (*Walt Whitman’s America* 309). Thus, although the majority of the population was still practicing various forms of Christianity, the church had lost control both of cosmological information (experimentation having replaced revelation as the most trusted source of knowledge) and of how it was disseminated (printing and literacy having democratized the discussion). The nature of nature was becoming ever more accessible to the layman through public lectures and published books and articles.

When it came to seizing these opportunities for self-education, few could match the enthusiasm demonstrated by Whitman throughout the decades of his adulthood. Among his many personal papers and scrapbooks are over seventy clippings with scientific subjects (“Whitman’s Indebtedness” 90). He is also known to have associated with and even corresponded with several notable men of science, including naturalist John Burroughs, chemist Justus Liebig, and astronomer Henry Whitall (“Whitman’s Indebtedness” 89, Reynolds 78). Dugdale explores Whitman’s relationship to Whitall extensively and notes that he evolved from

an acquaintance to a sometime-tutor, offering Whitman “some valuable lessons in astronomy with the open sky as his textbook” (129).

Whitman not only enjoyed learning about the natural world but developed a deep understanding of many of its principles, as evidenced by the consistent accuracy of his various poetic descriptions of physical phenomena. Dugdale and fellow critics like Foerster and Beaver have each examined Whitman’s references to nature in his poetry, from the smallest insects up through weather patterns and the movements of celestial bodies, and written independently about his correct use of biological nomenclature and astronomical processes. Thus we know that in the 1850s, when a young Whitman stepped outside to behold the star-salted sky each night, he was under no illusions about the nature of the heavenly bodies above or the grass underfoot.

The Evolution of *Leaves of Grass*

Not to exclude or demarcate, or pick out evils from their formidable masses (even to
expose them,)
But add, fuse, complete, extend—and celebrate the immortal and the good.
Haughty this song, its words and scope

“L. of G.’s Purport”

In his 72 years of life, Whitman pursued a variety of professions, from typesetter to schoolteacher to journalist—but nothing captured his imagination and won his devotion as much as his aspiration to be a great poet, or even *the* great poet of the young United States. Among his many pieces of prose and poetry, *Leaves of Grass* stands out as a deliberately-conceived masterpiece, which Whitman worked and reworked over decades in pursuit of a fully-developed magnum opus to leave as his legacy. From twelve untitled poems collected in a

thin but elegant first edition in 1855, through half a dozen iterations to a final volume in 1881, *Leaves of Grass* grew as wildly as its namesake. With each edition Whitman added new material, rearranged and reworded the old, and redefined his intentions. The resulting body of work is thus overwhelmingly complex.

As Roger Asselineau notes in *The Evolution of Walt Whitman: The Creation of a Book*, “In the course of successive editions, *Leaves of Grass* was subjected to a gradual intellectualization which made the sense and purpose of the book more accessible by introducing order and logic into the chaos of the original poems” (253). Out of respect for Whitman’s evolving vision for his own oeuvre, this paper will focus exclusively on his final 1881 composition, the sixth edition of *Leaves of Grass* published in Boston by James R. Osgood and Company. My intention is to explore his work in its most developed form, at the point when Whitman had incorporated the most insight and scientific knowledge.

The decision also runs parallel to Whitman’s belief in the geological evolution of the Earth and the biological evolution of species; in his mind, *Leaves of Grass* was always an organic, living being, and its continuous rebirth over the course of his lifetime parallels the life cycles of other creatures, or more broadly the intellectual evolution of humanity on a personal, national, and species-wide scale. As I’ll explore, Whitman didn’t interpret evolution as a random series of events or a purposeless chain of cause-and-effect, whether in terms of geology, biology, or human history. Rather, his poetry depicts a cosmos in which everything in creation works toward greater and greater accomplishment, higher and higher spirituality. Thus Whitman’s successive iterations of *Leaves of Grass* reflect its evolution to higher and higher

levels of physical truth and spiritual transcendence. It seems only fitting to examine the work in its most evolved form.

Dealing with Whitman's Eponymous Persona

I am large, I contain multitudes

"Song of Myself" 51

In the interest of simplicity, this paper will deliberately ignore the profound distinction between Walt Whitman the poet and Walt Whitman the persona, the voice who self-consciously narrates his poetry in terms of personal experiences, sensations, wants, needs, fears, and declarations of identity and soul. It goes without saying that Whitman the poet is altogether discrete from the voice he captures in print, a complex and flawed individual who intentionally creates a more limited fictional version of himself to portray on the page. If it didn't go without saying, his own letters outside *Leaves of Grass* indicate how deliberately he shapes a persona who is more wondrously freewheeling than he truly feel, more idealistically patriotic, more optimistic about the aging process (Stauffer).

It would, however, grow tedious to constantly repeat "Whitman's narrator," "Whitman's persona," "Whitman's voice," and so forth. For the purposes of analyzing *Leaves of Grass* in this paper I will therefore refer to the poetry's fictional persona simply as "Whitman." I feel justified in the choice because I believe that Whitman-the-poet indeed hoped to capture and convey an idealized version of himself. This question is open for debate elsewhere, of course, and I ask the reader's forgiveness for any difficulties created by my elision of the real and fictitious Whitmans in this discussion.

III. Contemporary Science in *Leaves of Grass*

Not for nothing is Whitman known as the nation's first great "poet of science." While the schools of Romanticism and Transcendentalism that preceded his development were as enthralled with nature as he, their emphasis was decidedly on the mystical qualities of the world around us. As Van Leer notes, American Romantics were generally

hostile to the ways in which Newtonian science undermined the spirituality of nature. R.W. Emerson rejected scientists as crypto-materialists whose 'spirit is matter reduced to extreme thinness.' E.A. Poe characterized science as a 'vulture' that 'preyest... upon the poet's heart.' And Nathaniel Hawthorne regularly portrayed the scientist as a villain whose relentless pursuit of some spurious ideal violated the inner sanctity of the human heart. (301)

To these men and their fellow Romantic poets, scientific analysis of nature was not merely irrelevant to literature, it was downright threatening.

In contrast, Whitman was never intimidated by science's supposed quest to drain the human experience of all romance and spirituality. According to Cooke, the nineteenth-century naturalist John Burroughs was not only an intimate friend of Whitman's but a great fan of his poetry, writing that *Leaves of Grass* was "the first serious and large attempt at an expression in poetry of a knowledge of the earth as one of the orbs, and of man as a microcosm of the whole" ("Whitman's Indebtedness" 91). Over a century later, literary scholar Beaver agrees in his 1974 book *Walt Whitman – Poet of Science*: "It is my belief that Walt Whitman was the first American poet to face the problem boldly; the first to embody modern scientific concepts in his work in a poetic manner" (ix).

Beaver also notes that "it is almost impossible to read a page of *Leaves of Grass* without encountering some sort of scientific allusion" (*Poet of Science* 39). The following exploration of Whitman's extensive incorporation of contemporary science into his magnum opus is therefore

far from comprehensive, but nevertheless sufficiently detailed and balanced to serve as a representative survey.

Physics

The great laws take and effuse without argument,
I am of the same style, for I am their friend

“Who Learns my Lesson Complete?”

One of the primary tenets of the Western scientific worldview, and one that potentially places it at odds with certain religious worldviews, is that the matter and energy constituting the physical universe aren't spiritually infused and divinely guided; rather, their behavior is dictated by consistent laws. Isaac Newton's 1687 *Principia Mathematica* outlines perhaps the most famous examples, the three laws of motion that became the foundation of classical mechanics and paved the way for the clockwork cosmology of the Enlightened Deists, including the famous “Fathers” who founded the United States.

Whitman is no Deist; he draws too heavily on mystical concepts of spirituality in place of hard logic to be considered a proponent of an absent Creator, let alone a world devoid of all spirituality as proposed by strict materialism. Still, although he takes an awestruck tone in his poetry, he never loses touch with the physical laws that ground his narrator to terra firma (unless acted upon by an outside force). His lyrical trips around the world or whirling through outer space are clearly framed as flights of imagination or even dream sequences, during which the principal source of wonder isn't transcendence beyond the physical plane but rather the very laws of physics themselves.

Thus we see that in *Leaves of Grass* Whitman references “laws” dozens upon dozens of times. Sometimes the word is tied to democratic institutions and associated with virtues like Liberty and Peace, as in the poem “America”: “Strong, ample, fair, enduring, capable, rich, / Perennial with the Earth, with Freedom, Law and Love.” Almost paradoxically, as often as Whitman praises this rule of law he chafes at the limits of political and social conventions and calls for individuals to cast them off in order to live a more natural existence. In “From Pent-up Aching Rivers” he yearns for freedom from manmade mandates: “O that you and I escape from the rest and go utterly off, free and lawless, / Two hawks in the air, two fishes swimming in the sea not more lawless than we.”

If Whitman counters the thesis of laws as a source of order and justice with the antithesis of laws as an artificial restriction to be rejected, he resolves the situation by calling on the laws of nature, which go beyond governments’ petty rules of quotidian behavior to define who we are as humans in harmony with the cosmos around us. The laws of nature free us to be our truest selves. This use of the word “law” in terms of physics and our natural state far and away outnumbers all others in *Leaves of Grass*; by way of a few examples:

Behavior lawless as snow-flakes, words simple as grass, uncomb’d head, laughter, and naivetè

“Song of Myself” 39

Divine instinct, breadth of vision, the law of reason, health, rudeness of body, withdrawnness

“Song of the Answerer” 2

To these proud laws of the air, the water and the ground, proving my interior soul impregnable,
And nothing exterior shall ever take command of me

“A Song of Joys”

Where the men and women think light of the laws,
Where the slave ceases, and the master of slaves ceases

.....
Where children are taught to be laws to themselves, and to depend on themselves

“Song of the Broad-Axe” 5

The law of the past cannot be eluded,
The law of the present and future cannot be eluded,
The law of the living cannot be eluded, it is eternal,
The law of promotion and transformation cannot be eluded

“To Think of Time” 7

Whitman’s embrace of the laws of nature, “of the air, the water and the ground,” as integral to the human condition indicates that he believes we aren’t somehow above the material plane, angelic souls impervious to its forces, but very much creatures of the elements and of physical cause and effect.

Far from disappointingly limiting us to a lowly existence, however, this view allows us to gaze skyward and know that our very being is contiguous with the stars’, freeing our imaginations to roam the heavens as an extension of our own “territory” (etymological pun intended). Thus Newton’s laws of motion fling Whitman past Earth’s gravitational field to wonder at the view from space a full century before manned rockets achieved liftoff:

My ties and ballasts leave me, my elbows rest in sea-gaps,
I skirt sierras, my palms cover continents,
I am afoot with my vision.

.....
Speeding through space, speeding through heaven and the stars,
Speeding amid the seven satellites and the broad ring, and the diameter of eighty thousand miles,
Speeding with tail’d meteors, throwing fire-balls like the rest,
Carrying the crescent child that carries its own full mother in its belly

“Song of Myself” 33

Astronomy

Rapport of sun, moon, earth, and all the constellations,
What are the messages by you from distant stars to us? What Sirius'? what Capella's?

“You Tides with Ceaseless Swell”

At first glance there's nothing particularly unusual about Whitman's recurring theme of celestial bodies in *Leaves of Grass*. The splendor of a star-studded night sky has inspired countless literary expressions over the course of human history, from the romantic moodiness of the moon to the ominous portents of eclipses and the symbolic significance of constellations. But having just established Whitman's love of the laws of nature, it's appropriate to investigate the instances in which he describes the sun, moon, planets, comets, meteors, and of course stars. Although their presence often contributes to the mysticism of his odes to nature, these references are particularly noteworthy for their accuracy, a characteristic that stands in stark contrast to the role stars have traditionally played in Western poetry.

When it comes to the presence of astronomy in *Leaves of Grass*, descriptions of gravity, orbits, centrifugal and centripetal forces, and specific stars and planets go beyond merely admiring the celestial bodies above. Rather, they're described with a precision that reinforces the fact that the stars and planets are very much a tangible and comprehensible part of our cosmos. This has been demonstrated by Dugdale's work comparing Whitman's descriptions of the stars to their actual arrangement: “By checking [his] statements with the use of any good maps of the ‘fixed stars,’ one may easily determine Whitman's accuracy, at least in all the dated pieces” (136). Furthermore, he writes, he has “not discovered a single instance in which he erred in naming or locating a heavenly body. When the large number of these observations is considered, the conclusion is inevitable that Whitman could readily identify the principal stars,

constellations, and planets” (Dugdale 136). This conclusion is corroborated by Beaver, who checked and confirmed the accuracy of twenty-five such observations of “unfixed bodies” (that is, five planets and the moon), albeit with “terminology [that] is not always astronomically correct” (“Walt Whitman, Star-Gazer” 311). Rather than diminish the significance of his accurate observations, Beaver argues that these incorrect uses of terminology indicate that Whitman was creatively expressing his own experiences rather than copying phrases directly from scientists’ work or consulting a “daily almanac in a newspaper” (“Walt Whitman, Star-Gazer” 311-2).

The precision with which Whitman depicts the sun, moon, and “fixed stars” of the night sky indicates that to him, celestial bodies are very much knowable objects ripe for human study. They aren’t mysterious constellations left by the legends of Greek or Roman deities, nor are they pristine players in a Judeo-Christian God’s “divine comedy.” They are masses of the same substance as Earth, following the same natural laws we follow in our daily lives.

Our Sister Planets

The seven satellites and the broad ring

“Song of Myself” 33

To wit, we just saw that in “Song of Myself” 33 Whitman envisions himself launching from his home planet to soar outward through space,

Speeding amid the seven satellites and the broad ring, and the diameter of eighty thousand miles,
Speeding with tail’d meteors, throwing fire-balls like the rest

Whitman is “like the rest,” yet another celestial body capable of journeying among the others. As for the objects amid which he speeds, the “seven satellites” clearly refer to the known planets at the time of his birth. Curiously, an eighth planet was discovered in 1846 when he was just 27 years old, but *Leaves of Grass* makes no reference to Neptune. In fact, its status as the farthest-flung planet is entirely ignored in “Song of Myself” 26, which instead uses Uranus in its hyperbolic description of distance: “The orchestra whirls me wider than Uranus flies.”

While *Leaves of Grass* references Saturn indirectly by way of its “broad ring” above, it never calls it by name; Mercury and Neptune are left similarly anonymous, and “Uranus” appears in just the one line. In contrast to these omissions, Venus, Mars, and Jupiter play a vivid role in “Out From Behind This Mask” when Whitman compares his own skull to a “globe,” an “astronomic orb [subtler] than sun or moon, than Jupiter, Venus, Mars.” The implication is that he feels a connection between his own body and these particular planets, whose orbits recall the “convolutions” of his thoughts within his head. The sense of intimacy with these three in particular is easy to understand: these are the planets most recognizable to the naked eye and thus the most likely to have figured in Whitman’s personal experiences pondering the night sky. In his analysis of his notes and letters, Beaver confirms that in the field of astronomy, “Whitman was particularly interested in the planets; he followed the movements of Venus, Mars, Jupiter, and Saturn almost day by day” (“Walt Whitman, Star-Gazer” 312).

None is more intimate than Jupiter, though. Its exceptional brightness against the constellations is perhaps what earned it a “starring” role in “On the Beach at Night”: “Amid a transparent clear belt of ether yet left in the east, / Ascends large and calm the lord-star

Jupiter.” In the ensuing stanzas, a child cries upon seeing its point of light disappear behind dark clouds, only to be reassured by the poet’s voice that

Jupiter shall emerge, be patient, watch again another night, the Pleiades shall emerge,
They are immortal, all those stars both silvery and golden shall shine out again,
The great stars and the little ones shall shine out again, they endure,
The vast immortal suns and the long-enduring pensive moons shall again shine.

There is thus a dichotomy in Whitman’s use of the “seven” planets in his poems: Venus, Mars, and Jupiter, the morning and evening stars, the brightest and most recognizable, appear as familiars in scenes of contemplation and consolation. The farther-flung planets, Saturn and Uranus, are referenced only briefly and abstractly as symbols of grandeur. Saturn’s ring is invisible without a powerful telescope, so it’s unlikely Whitman ever saw it himself, but he chooses to mention it in his flight of fancy as a detail that reinforces the specific reality of our solar system—he’s not losing himself in a theoretical plane of Platonic ideals but exploring the known universe as he’s both witnessed it directly and studied it through others’ research. Still, Saturn remains unseen and thus somewhat abstracted: he doesn’t describe its ring except by way of its measurement, “the diameter of eighty thousand miles,” a figure he undoubtedly noted from a lecture or essay.

While the nearer, more recognizable planets are given a more personal treatment than the more distant, obscured ones, Whitman does ultimately consider each of them worthy of inclusion in his magnum opus (except, alas, poor Neptune). After all, they are our family: in “A Song of the Rolling Earth,” our own home planet waltzes with them in the great dance choreographed by the laws of nature:

Of the interminable sisters,
Of the ceaseless cotillions of sisters,
Of the centripetal and centrifugal sisters, the elder and younger sisters,

The beautiful sister we know dances on with the rest.

Extraterrestrial Chaos

All identities that have existed or may exist on this globe, or any globe

“On the Beach at Night Alone”

Whitman extends a similar realism to the sun, moon, meteors, and stars throughout *Leaves of Grass*. These celestial bodies may be wondrous and worthy of praise, but they are also mutable and evolving: his poems express explicit awareness that just as our planet is one “sister” among many, our solar system is one among many, and stars like our sun rise and fall:

Forms, qualities, lives, humanity, language, thoughts,
The ones known, and the ones unknown, the ones on the stars,
The stars themselves, some shaped, others unshaped

“Germs”

The reference to stars both “shaped” and “unshaped” indicates that the universe was not completed within a fixed period of creation, but continues to evolve as even mighty stars, once thought to be “fixed” in the heavens, in fact go through processes of formation as well as dissolution. He goes further in his depiction of stellar drama with “Eidólons,” in which he draws a direct connection between our own solar system and others by using the words “stars” and “suns” interchangeably:

All space, all time,
(The stars, the terrible perturbations of the suns,
Swelling, collapsing, ending, serving their longer, shorter use)

Amid this upheaval, Earth is neither central to the cosmic plan (as in Catholic geocentrism) nor even unique in its support of life. Multiple poems in *Leaves of Grass* allude to the possibility of extraterrestrial species, generally referenced with the same tone of awestruck

credulity as descriptions of “exotic” cultures across Earth’s own continents. Take, for instance, the thrust of the brief poem “On the Beach at Night Alone”:

A vast similitude interlocks all,
All spheres, grown, ungrown, small, large, suns, moons, planets,
All distances of place however wide,
All distances of time, all inanimate forms,
All souls, all living bodies though they be ever so different, or in different worlds,
All gaseous, watery, vegetable, mineral processes, the fishes, the brutes,
All nations, colors, barbarisms, civilizations, languages,
All identities that have existed or may exist on this globe, or any globe,
All lives and deaths, all of the past, present, future,
This vast similitude spans them, and always has spann’d,
And shall forever span them and compactly hold and enclose them.

What might otherwise be taken as an eloquent summary of post-Enlightenment cosmology takes a bold step off the freshly-beaten path with just three words: “or any globe.” Whitman has officially acknowledged a belief that life “may exist” elsewhere in the universe. A similarly casual acknowledgement is found in “Unseen Buds,” where Whitman waxes poetic about the vitality of seeds hibernating “Under the snow and ice.” He imagines these seeds of life as

Germinal, exquisite, in delicate lace, microscopic, unborn,
Like babes in wombs, latent, folded, compact, sleeping;
Billions of billions, and trillions of trillions of them waiting,
(On earth and in the sea—the universe—the stars there in the heavens,)
Urging slowly, surely forward, forming endless,
And waiting ever more, forever more behind.

In this imagining, the potential for life is not limited to our own planet but is “forming endless” wherever there is matter. Whitman envisions organisms in the “trillions” with “forever more behind,” as if life is not a sacrosanct hallmark of Earth alone but an unstoppable force across the universe. This sentiment of life’s inevitability is reinforced in “Song of Myself” 45:

There is no stoppage and never can be stoppage,
If I, you, and the worlds, and all beneath or upon their surfaces, were this moment reduced back
to a pallid float, it would not avail in the long run,
We should surely bring up again where we now stand,
And surely go as much farther, and then farther and farther.

On their own these comments may seem more whimsical than scientific; Whitman has merely taken his musings on the beach and his abstract convictions about life, and imaginatively extended these earthy ideas to the sky above. But the idea of extraterrestrial life fits nicely with the scientific ideas of Whitman's day. For centuries if not millennia beforehand, virtually all Westerners believed that humanity was created in the divine image and was thus distinctly sacred compared to mere animals. During the nineteenth century, however, the burgeoning theory of evolution turned this concept on its head by proposing that our species is one of many to have developed by chance out of physical processes. We'll return to this concept later, but for now it's sufficient to note that as Earth was displaced from the center of the cosmos, so humanity was toppled from its supposedly unique position as ruler of all, with God-given "dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth" (King James Version, Genesis 1:28).

In "Song of Myself" 43 Whitman is even bolder and more direct in his claims to life beyond Earth. "One of that centripetal and centrifugal gang I turn and talk like a man leaving charges before a journey," he writes, apparently associating his narrator with the planets themselves, the "centrifugal gang." "I do not know what is untried and afterward, / But I know it will in its turn prove sufficient, and cannot fail." This undefined "it," be it his own faith or some external truth, will satisfy all elements of existence: It cannot fail

the sacs merely floating with open mouths for food to slip in,
Nor any thing in the earth, or down in the oldest graves of the earth,
Nor any thing in the myriads of spheres, nor the myriads of myriads that inhabit them,
Nor the present, nor the least wisp that is known.

With the “pallid float” of “Song of Myself” 45 above and the “sacs merely floating” here in 43 he envisions biological processes unfolding on “myriads of spheres” or “worlds,” “beneath or upon their surfaces.” And not only are there lifeforms inhabiting far-flung worlds in *Leaves of Grass*, but they are in possession of their planets just as we are in possession of ours:

The earth, that is sufficient,
I do not want the constellations any nearer,
I know they are very well where they are,
I know they suffice for those who belong to them.

“Song of the Open Road” 1

It’s significant to note that Whitman not only presumes that there are alien lifeforms inhabiting constellations that “belong to them”—he is untroubled by the thought. The existence of these beings doesn’t threaten his own sense of self or his place on Earth, which “Song of the Open Road” goes on to celebrate enthusiastically. The experiences of extraterrestrial creatures must be foreign to our own, but no more so than those of creatures living in the more exotic corners of Earth, like the murky depths of the oceans. He describes the “otherworldly” nature of sea creatures in “The World Below the Brine,” which concludes as follows:

The change thence to the sight here, and to the subtle air breathed by beings like us who walk
this sphere,
The change onward from ours to that of beings who walk other Spheres.

The relationship between creatures of the deep and humans on land is thus analogous to that between us and the creatures of deep space: we may be foreign to one another, but we pose no existential threat to one another while inhabiting the same marvelous universe, each in our own ways.

Leaves of Grass expends no further energy on imagining the precise nature of extraterrestrial life. Whitman is content to write of its presumed existence almost in passing as yet another feature of the natural world's wonders and an extension of what we experience here on Earth. This casual acknowledgement speaks volumes about his acceptance of the latest scientific theories of his day and their implications about human nature, in contrast to those who resisted theories of Old Earth geology and evolution and clung instead to religious notions of humanity's sacred central role in the cosmos.

That is not to say that Whitman didn't sometimes thrill in the overwhelming enormity and chaos of a universe with so many constellations, so many lifeforms. While stars and planets follow regular orbits, there are still "comets and meteors transient and strange" whose "fitful" appearances feel ominous. He conveys this sense of cosmological terror in "Year of Meteors (1859-60)":

I forget not to sing [...] the comet that came unannounced out of the north flaring in heaven,
Nor the strange huge meteor-procession dazzling and clear shooting over our heads,
(A moment, a moment long it sail'd its balls of unearthly light over our heads,
Then departed, dropt in the night, and was gone;)
Of such, and fitful as they, I sing—with gleams from them would I gleam and patch these chants,
Your chants, O year all mottled with evil and good—year of forebodings!
Year of comets and meteors transient and strange—lo! even here one equally transient and
strange!

In this poem Whitman uses unsettling astronomical events as a metaphor for the year's political upheaval, drawing on a pre-scientific tradition of interpreting comets and eclipses as evil portents. It's an effective device, but one that stands apart from references to astronomy elsewhere in *Leaves of Grass*. Ultimately, Whitman's poetry swoops through the chaos of outer space in excited victory laps only to return to our own solar system, where it again celebrates the elegance of natural laws:

We stand amid time beginningless and endless, we stand amid evil and good,
All swings around us, there is as much darkness as light,
The very sun swings itself and its system of planets around us,
Its sun, and its again, all swing around us.

As for me, (torn, stormy, amid these vehement days,)
I have the idea of all, and am all and believe in all,
I believe materialism is true and spiritualism is true, I reject no part.

“With Antecedents” 2

The darkness that “swings around us” can be disorienting and ominous, but Whitman “reject[s] no part” of the universe. He will not discount any aspect of reality out of religious prejudice or mere fear; he will face everything boldly and continue to “believe in all.” The concluding emphasis is not on the chaos of comets but on the swinging of our sun, that most familiar and predictable of stars, sustainer of life on Earth.

Back to Earth

The divine ship sails the divine sea

“A Song of the Rolling Earth” 1

While Earth may not reside at the center of our universe in the literal sense claimed by geocentrism, Whitman renders it the central focus of his poetic world by celebrating the marvelous balance of our home solar system and our planet. In an unfathomably large universe that is shot through with a certain amount of thrilling unpredictability, Earth is a haven of stability. On several occasions *Leaves of Grass* even depicts Earth as a ship carrying humans through stormy seas:

The fluid vacuum around and ahead still entering and dividing,
No balk retarding, no anchor anchoring, on no rock striking,
Swift, glad, content, unbereav'd, nothing losing,
Of all able and ready at any time to give strict account,

The divine ship sails the divine sea.

“A Song of the Rolling Earth” 1

For it [the soul] the entire star-myriads roll through the sky.
In spiral routes by long detours,
(As a much-tacking ship upon the sea,)

“Song of the Universal” 2

If this metaphor doesn't sufficiently demonstrate Whitman's love of our home planet as a safe haven in the cosmos, his praise is more explicit elsewhere. In “Who Learns My Lessons Complete?” he marvels:

It is no small matter, this round and delicious globe moving so exactly in its orbit for ever and ever, without one jolt or the untruth of a single second

.....
And that the moon spins round the earth and on with the earth, is equally wonderful,
And that they balance themselves with the sun and stars is equally wonderful.

Here we see that the Earth's relationship with the moon is particularly soothing in its intimate rhythms. This sentiment is reinforced in “Vocalisms”: “Surely whoever speaks to me in the right voice, him or her I shall follow, / As the water follows the moon, silently, with fluid steps, anywhere around the globe.” Whitman understands that these two spheres are held in their dance by gravity, and his comparison of the moon's powerful gravitational pull to the powerful “pull” of human voices is an example of his taste for using the laws of nature to poetically express the subjective human experience.

The subjective human experience is, after all, the true heart of poetry. Even “A Song of the Rolling Earth” becomes a song of the poet and of the reader, who are at the center of all natural laws, the entire cosmos, the orbiting planets, and the spinning planet:

Whoever you are! motion and reflection are especially for you,
The divine ship sails the divine sea for you.
Whoever you are! you are he or she for whom the earth is solid and liquid,

You are he or she for whom the sun and moon hang in the sky

“A Song of the Rolling Earth” 2

This primacy of the subjective and the metaphysical in the face of so much poetry about the objective and the physical is the paradox which I will ultimately explore through this paper.

Geology

It is no small matter, this round and delicious globe moving so exactly in its orbit

“Who Learns My Lessons Complete?”

We’ve established that across the poetry of *Leaves of Grass*, Whitman consistently embraces the cutting-edge scientific discoveries of his day rather than cling to old dogmas. From the predictable laws of physics to the enormity of outer space, he describes the cosmos in terms of natural phenomena—including our own Earth, which is not only displaced from the center of the Old World’s old worldview but described as an ancient and mutable mass. Let’s turn our attention now to the study of our home planet and the ways in which Whitman references that study in his work.

Old Earth

Long has the globe been rolling round

“Song of the Exposition” 1

Unlike astronomy, which enjoyed a great deal of attention dating back to the philosophers of Greece, China, and the Arab empire long before Western Europeans and Americans took up telescopes, geology had only recently developed as its own branch of study at Whitman’s birth. The Scottish scholar James Hutton pioneered the field with his 1785 paper

Theory of the Earth, which first proposed to the scientific community at large that our planet must be far older than the 10,000 years previously calculated by Biblical scholars. Hutton based this broader timescale on the new theory that Earth was not created fully-formed in a single event, but rather evolved into its current state through eons-long processes of solidifying, shifting, and eroding. Sir Charles Lyell's 1830 *Principles of Geology* further advocated for the theory that the rocks and landforms we see today developed gradually over millions of years, and in fact are continuing to develop to this day. Scientists debated the question of Earth's age throughout the decades of Whitman's life, with hypotheses ranging from several hundred thousand to several billion years.

Eventually this concept of an old Earth would rile up resistance among Biblical creationists who felt threatened by the scientific community's "attack" on the first few chapters of Genesis, much like the Catholic Church when it retaliated against Galileo several hundred years earlier. Whitman, however, had no such qualms about the implications of geologists' "Old Earth" theory, and characteristically gave his tacit approval by incorporating the new ideas into his poetry:

These also are the lessons of our New World;
While how little the New after all, how much the Old, Old World!
Long and long has the grass been growing,
Long and long has the rain been falling,
Long has the globe been rolling round.

"Song of the Exposition" 1

More explicitly still, in "Who Learns My Lessons Complete?" he notes

It is no small matter, this round and delicious globe moving so exactly in its orbit for ever and ever, without one jolt or the untruth of a single second,
I do not think it was made in six days, nor in ten thousand years, nor ten billions of years,
Nor plann'd and built one thing after another as an architect plans and builds a house.

This assertion goes beyond accepting that the Earth is older than the Biblical timeline: by dismissing the idea of “an architect,” Whitman implies that our world arose through natural processes, without the miraculous intervention of the divine Creator of Genesis or even of Deism. According to this view, scientific investigations don’t just examine the nature of the physical world, they can supersede old religious explanations for the world.

So strong is Whitman’s enthusiasm for geologists’ theories of Earth’s ancientness that he exaggerates its age beyond any claims made by the geologists themselves:

The clock indicates the moment—but what does eternity indicate?
We have thus far exhausted trillions of winters and summers,
There are trillions ahead, and trillions ahead of them.

“Song of Myself” 44

The hyperbolic timeframe of “trillions” of years has, in Whitman’s imagination, allowed for “Nations ten thousands of years before these States, and many times ten thousand years before these States” (“Unnamed Lands”). Clearly, rather than strike fear in his heart by casting doubt on Christian tradition, the concept of an ancient or even an ageless world inspires wonder for Whitman. Thanks to scientific theories that suggest incredibly distant horizons and a world of unknowns, he’s able not only to fling his imagination outward in space, but to send it backward in time to fantastic prehistories.

Geology

Strata of mountains, soils, rocks

“Eidólons”

He can also send it forward to a future of infinite possibilities: Old Earth geology suggests that the planet is continuing to evolve at a pace that’s perhaps imperceptible within a

human's lifetime but all the grander for its incomprehensible scale. *Leaves of Grass*

acknowledges that although our planet serves as a stable ship ferrying us through space, it isn't a firm foundation beneath us. It's as mutable and fragile as anything else in our lives, almost another living creature or character changing with us:

Thou globe of globes! thou wonder nebulous!
By many a throe of heat and cold convuls'd, (by these thyself solidifying,)
Thou mental, moral orb—thou New, indeed new, Spiritual World!
The Present holds thee not—for such vast growth as thine,
For such unparallel'd flight as thine, such brood as thine,
The FUTURE only holds thee and can hold thee.

“Thou Mother with Thy Equal Brood” 6

Whitman further marvels at the planet's physical complexity, from its core through layers of diverse material up to the familiar crust. In “Eidólons,” for instance, he sings of “the dim beginning, / Ever the growth, the rounding of the circle, [...] Ever the mutable, / Ever materials, changing, crumbling, re-cohering.” Again, his very acknowledgement of the Earth's recently-explored composition stands in contrast to the mythologizing of cosmic bodies as perfect creations and pure religious symbols. Far from depicting a pristine or even divine center of a cosmic plan, “Song of the Universal” describes “this broad earth of ours, / Amid the measureless grossness and the slag,” while in “Thou Mother with Thy Equal Brood” he writes of “Thy soil, thy very subsoil all upheav'd, / The general inner earth so long so sedulously draped over, now hence for what it is boldly laid bare.”

But this “grossness,” “slag,” “soil,” and “subsoil” are no detriment to Earth's value. As “Thou Mother” continues, beneath the slag and “Enclosed and safe within its central heart, / Nestles the seed perfection.” Earth's core (a word tied etymologically to the French “cœur,” that is, its central “heart”) may seem dead, but it is as much a source of life as seeds

themselves. Planet Earth is thus a complex, muddy, multi-layered object of love for Whitman, as well as a source of inspiration as personified by the Muse in “Song of the Exposition” 3: “The same undying soul of earth’s, activity’s, beauty’s, heroism’s expression, / Out from her evolutions hither come, ended the strata of her former themes.”

The use of the word “strata” is particularly significant here, since layers of ancient rock are literally the foundation of modern geology. Scientists of the eighteenth and nineteenth centuries were the first to inspect the structure of mountains and mesas and deduce that the striations within different rock types, as well as the points where their patterns are interrupted by sudden angles, are a physical record of the planet’s long past. These observations did not go unnoticed by Whitman, who mentions the process of Earth’s gradual formation of rock layers in “Song of Myself” 44: “the nebula cohered to an orb, / The long slow strata piled to rest it on.” This geologic time scale is also referenced in “Eidólons,” where he writes “Of vanish’d lands... / Densities, growth, façades, / Strata of mountains, soils, rocks.”

The most specific use of geological jargon in *Leaves of Grass* can be found in “Song of Myself” 31, where allusions to Earth’s age aren’t merely made in passing to indicate Whitman’s source of poetic inspiration or to emphasize the grandiosity of other themes. Here he refers quite bluntly to plutonism, the geologic theory proposed in the second half of the eighteenth century in opposition to neptunism. In short, where Abraham Gottlob Werner’s neptunism proposed that Earth’s rocky masses had formed by settling out of oceanic suspension and gradually solidifying, plutonism argued that rocks were largely the product of volcanic activity cycling matter through molten states. One type of volcanic rock is gneiss, which Whitman includes in his sweeping self-portrait: “I find I incorporate gneiss, coal, long-threaded moss,

fruits, grains, esculent roots." He continues, "the plutonic rocks send their old heat against my approach, [...] the mastodon retreats beneath its own powder'd bones."

Geography

Within me latitude widens, longitude lengthens

"Salut Au Monde!" 2

If the Earth came into existence not through an act of divine intervention but through eons of upheaval and erosion, it may seem too arbitrary and chaotic a place to serve as the perfect home for humanity. And yet in "I Sing the Body Electric" 44 Whitman indicates that, somehow, he still feels the world came into being for the purpose of hosting us:

For [me] the nebula cohered to an orb,
The long slow strata piled to rest it on,
Vast vegetables gave it sustenance,
Monstrous sauroids transported it in their mouths and deposited it with care.

Implicit in this description is the belief that while Earth was not placed at the center of the physical universe, we humans remain at the center of the metaphysical scheme. By inhabiting Earth's surface, we render it special and worthy of poetic praise. Thus in "Salut Au Monde" (French for "Greeting to the World") he begins his address to the human race by envisioning the globe they inhabit:

I see a great round wonder rolling through space,
.....
I see the shaded part on one side where the sleepers are sleeping, and the sunlit part on the other side,
I see the curious rapid change of the light and shade,
I see distant lands, as real and near to the inhabitants of them as my land is to me.

Over the course of the poem's thirteen sections, Whitman imagines flying over all the cultures of the world, watching children at play and adults at work, hearing people speak different

languages and sing different songs. Along the way he identifies each civilization with their local topography and climate, establishing a connection between Earth's physical complexity and humanity's cultural richness. From "the sierras of the Andes where they range" to "the Libyan, Arabian, and Asiatic deserts," from "huge dreadful Arctic and Antarctic icebergs" to "the long river-stripes of the earth," Whitman displays a detailed knowledge of the globe's geography and uses all this knowledge to heap praise on the planet and its populations. In sum:

Within me latitude widens, longitude lengthens,
Asia, Africa, Europe, are to the east—America is provided for in the west,
Banding the bulge of the earth winds the hot equator,
Curiously north and south turn the axis-ends,
Within me is the longest day, the sun wheels in slanting rings, it does not set for months,
Stretch'd in due time within me the midnight sun just rises above the horizon and sinks again,
Within me zones, seas, cataracts, forests, volcanoes, groups

Ultimately, then, in *Leaves of Grass* Whitman's vocabulary and imagery indicate that he has not only studied but fully embraced the theories of nineteenth-century geologists: the Earth is an ancient planet that coalesced gradually from matter in space and evolved over the eons through the processes of plutonism. Rock strata tell this story, and the continents and oceans we know today are continuing to morph toward unknown futures. Some of Whitman's contemporaries reacted to these new theories with fear, feeling they implied that Earth was an unstable accident of physics and humanity was an insignificant animal species on its surface; these groups grew to reject scientific theories and cling instead to Biblical creation stories. Whitman, however, expresses only wonder and excitement at the ideas proposed by scientists. Earth, with its complex history and chaotic topography, serves as a great muse for his adventurous imagination and thus his poetry. In fact, informed as he is about geology, Whitman is all the more content to declare that Earth embraces humanity as it ferries us through space:

Embracing man, embracing all, proceed the three hundred and sixty-five resistlessly round the sun;
Embracing all, soothing, supporting, follow close three hundred and sixty-five offsets of the first, sure and necessary as they.
Tumbling on steadily, nothing dreading

“A Song of the Rolling Earth” 1

Dreading nothing, let us next examine what *Leaves of Grass* implies about the nature of humanity as a species on this globe as it tumbles through space, accompanied by sister planets, following the laws of nature.

Biology

Of Life immense in passion, pulse, and power,
Cheerful, for freest action form'd under the laws divine

“One's-Self I Sing”

Physics, astronomy, and geology are all branches of scientific study that require particular, unusual resources to pursue. Without laboratories, telescopes, and travels to diverse sites across the continents, let alone years developing one's expertise, few individuals are capable of directly engaging in their study. Thus in order to incorporate their theories and discoveries into his poetry, Whitman necessarily learned about the laws of physics, the motions of stars and planets, and the ancient formation of Earth's rocky strata indirectly by following the work of professional scientists.

In contrast, the basics of macroscopic biology are readily accessible to us all through the environment, plants and animals, and of course our own bodies. For millennia before the Scientific Revolution, humans survived and thrived thanks to the accumulation of folk knowledge about the natural world, which enabled the development of agriculture, animal

domestication, and rudimentary medicine. This ability to experience “biology” directly in one’s daily life is significant in *Leaves of Grass*; much as the nearer, brighter planets earn more attention in Whitman’s poetry than the meteors and rings about which he’s only learned second-hand, biology plays a larger role than physics, astronomy, and geology.

Indeed, for as much as Whitman is a poet of scientific analysis, he is also a poet of unfiltered nature: he loved to lose himself in long walks outdoors, soaking in the world’s sights, smells, and sounds. Although he avidly analyzed the work of scientists through their lectures and publications, he often preferred to step away from these discourses to explore the environment firsthand. This enthusiasm for direct experience comes through in *Leaves of Grass*, which devotes far more attention to the immediacy of Earth’s flora and fauna than it does to the abstract, farther-flung facts of astronomy and geology. Take, for instance, “The Commonplace,” in which he declares that “The open air I sing, freedom, toleration, / (Take here the mainest lesson—less from books—less from the schools,)” as well as his assertion in “Song of Myself” 2 that “A morning-glory at my window satisfies me more than the metaphysics of books.” The call to action is most urgent in “Passage to India” 9: “Have we not darken’d and dazed ourselves with books long enough? / Sail forth—steer for the deep waters only.”

In fact, while Whitman dedicated decades of his life to studying the sciences and celebrating their wonders in poetry, he goes so far as encourage readers to step away from the very poetry they’re reading and experience the world for themselves:

You shall no longer take things at second or third hand, nor look through the eyes of the dead,
nor feed on the spectres in books,
You shall not look through my eyes either, nor take things from me,
You shall listen to all sides and filter them from your self.

“Song of Myself” 2

Flora and Fauna

Germinal, exquisite, in delicate lace, microscopic, unborn

“Unseen Buds”

Whitman offers us a splendid role model for this approach in “There Was a Child Went Forth,” which describes a boy who sets out “every day” to explore the world. As the seasons pass month by month, he’s keenly aware of each change in the living ecosystem around him: “These became part of that child who went forth every day, and who now goes, and will always go forth every day.” Perhaps this boy is Whitman’s own projection of himself, striving to maintain a childlike sense of attentive wonder throughout his adulthood; perhaps he simply uses the character to represent an ideal mode of living. Regardless, the level of detail captured in the poem indicates that Whitman, too, “look’d upon” everything he could, and let every “object [become] part of him for the day or a certain part of the day, / Or for many years or stretching cycles of years.”

Early in the poem, in “the Third-month,” lilacs, morning-glories, and clover are complemented by “the song of the phoebe-bird,” as well as new-born lambs, piglets, foals, and calves. Next the “field-sprouts of Fourth-month and Fifth-month became part of him,” from winter-grain and corn to “apple-trees,” “wood-berries,” “and the commonest weeds by the road.” In short, Whitman doesn’t merely mention plants and birds, he paints a realistic scene by naming specific species and noting their features as they change season by season.

This theme of active awareness and attention to the details of nature is also evident in “Starting From Paumanok” 1, in which Whitman reflects on the vividness of his experience “roaming many lands”:

Aware of the fresh free giver the flowing Missouri, aware of mighty Niagara,
Aware of the buffalo herds grazing the plains, the hirsute and strong-breasted bull,
Of earth, rocks, Fifth-month flowers experienced, stars, rain, snow, my amaze,
Having studied the mocking-bird's tones and the flight of the mountain-hawk,
And heard at dawn the unrivall'd one, the hermit thrush from the swamp-cedars

The level of specificity extends beyond naming the species of plant or animal to include their transformation in behavior as the seasons pass. In "Roots and Leaves Themselves Alone Are These," we see "Frost-mellow'd berries and Third-month twigs offer'd fresh to young persons wandering out in the fields when the winter breaks up." Next, he observes "in April and May, the hylas croaking in the ponds, the elastic air, / Bees, butterflies, the sparrow with its simple notes" ("Warble for Lilac-Time"). "When the lilac-scent was in the air and Fifth-month grass was growing," Whitman sees "Two feather'd guests from Alabama, two together" who migrate north to build "their nest, and four light-green eggs spotted with brown" ("Out of the Cradle Endlessly Rocking"). By "Song of Myself" 33 it is summer, and Whitman is

Walking the path worn in the grass and beat through the leaves of the brush,
Where the quail is whistling betwixt the woods and the wheat-lot,
Where the bat flies in the Seventh-month eve, where the great gold-bug drops through the dark,
Where the brook puts out of the roots of the old tree and flows to the meadow,
Where cattle stand and shake away flies with the tremulous shuddering of their hides

In September he sings to Nature itself: "Keep your fields of clover and timothy, and your corn-fields and orchards, / Keep the blossoming buckwheat fields where the Ninth-month bees hum." Later, while "Crossing Brooklyn Ferry," Whitman watches "the Twelfth-month sea-gulls, saw them high in the air floating with motionless wings."

This return to Brooklyn serves as a reminder: Whitman spent most of his childhood living in cramped city blocks and eventually performed the urban work of a printer, teacher, and writer. At no point did he dirty his hands with farm work and thus need to take note of the crops' development through cycles of planting, growth, and harvesting each year. The attention

he pays to these plants, livestock, wildflowers, and birds is instead an extension of the passionate intellectual curiosity that fueled his study of more abstract scientific knowledge. In his analysis, Foerster finds that Whitman notes “over thirty species that he had observed... a number hardly comparable with the one hundred or so which a trained ornithologist could have discovered, but still a number far greater than the average farmer names” (“Whitman as a Poet of Nature” 738-9).

Furthermore, the details Whitman notes aren’t limited to the loveliness of flowers or birds, which commonly serve to embellish poetry of various genres. In “Song of Myself” 16 he notes that even the “moth and the fish-eggs are in their place,” in “Miracles” he delights in “the wonderfulness of insects in the air,” and in “A Noiseless Patient Spider” he observes how the arachnid “launch’d forth filament, filament, filament, out of itself, / Ever unreeling them, ever tirelessly speeding them.” He immerses himself fully in a whole swamp’s worth of less decorative flora with “These I Singing in Spring”:

Here, out of my pocket, some moss which I pull’d off a live-oak in Florida as it hung trailing
down,
Here, some pinks and laurel leaves, and a handful of sage,
And here what I now draw from the water, wading in the pond-side,
.....
And twigs of maple and a bunch of wild orange and chestnut,
And stems of currants and plum-blows, and the aromatic cedar

The processes by which all these plants develop interests him as much as their diversity. The poem “Unseen Buds” is as tiny yet potent as the seeds it describes:

Unseen buds, infinite, hidden well,
Under the snow and ice, under the darkness, in every square or cubic inch,
Germinal, exquisite, in delicate lace, microscopic, unborn,
Like babes in wombs, latent, folded, compact, sleeping

Whitman knows the potential of these “microscopic, unborn” seeds: “If you bring the warmth of the sun to them they will open and bring form, color, perfume, to you, / If you become the aliment and the wet they will become flowers, fruits, tall branches and trees” (“Roots and Leaves Themselves Alone”). It is “Thou Orb Aloft Full-Dazzling” that supplies the “fructifying heat and light,” “fructifying all” (“Thou Mother with Thy Equal Brood” 5). The term “fructifying” indicates simply that the sun brings forth fruit from the plants, but with Whitman it serves the double purpose of referencing photosynthesis, the process of incorporating sunlight’s energy into sugars called fructose, first theorized in the seventeenth century and the subject of study by biologists and chemists throughout Whitman’s lifetime. He uses the term a third time in “Ashes of a Fallen Soldier”: “Perfume all,” he asks of love itself,

make all wholesome,
Make these ashes to nourish and blossom,
O love, solve all, fructify all with the last chemistry.

The Theory of Evolution

Evolution—the cumulative—growths and generations

“L. of G.’s Purport”

What is remarkable about *Leaves of Grass* when contrasted with the poetic traditions out of which it grew is that it goes beyond folk knowledge and first-hand experiences of plants and animals, interweaving them with the latest terminology and discoveries of professional biologists. These allusions to photosynthesis are just one small example. More significantly, writing in the nineteenth century, Whitman developed his poetry in parallel to the scientists who developed the theory of evolution.

Philosophers have debated the origins and relationships of Earth's diverse flora and fauna since ancient times, but following the Enlightenment's turn toward materialist explanations of natural phenomena, scientists began hypothesizing about the mutability of species from generation to generation. Pierre Louis Maupertuis first proposed in 1751 that generations of organisms could accumulate differences over time; his work was followed by that of Erasmus Darwin, who suggested that many species could have "descended" from a common ancestor. As scholar of Romanticism Trevor Levere notes, at the time that Whitman began drafting poetry in the mid-1800s, "Evolutionary or developmental theories were well known in the life sciences, in the work of Comte de Buffon, Jean-Baptiste Lamarck, Erasmus Darwin, and others" (301). Whitman's notes and letters indicate that "as early as 1855 and even before, Whitman had had the prescience of evolutionism, not by a sort of genial intuition, but because the idea had already been in the air for a long time" (Asselineau 49).

No scientist crystalized this idea, bringing it out of the air and into the mainstream debate, so clearly and resoundingly as Charles Darwin. Both Whitman's *Leaves of Grass* and Darwin's *On the Origin of Species* are magna opera, drafted over decades of dedicated work. They also parallel each other chronologically: Darwin began developing his theory of "natural selection" in 1838, but didn't publish his groundbreaking final product until the close of 1859. Meanwhile, Whitman's first edition of *Leaves of Grass* went to press in 1855, to be developed over another thirty-five years into the final edition we're examining at present. As Asselineau writes, "We do not know what [Whitman's] reactions were when the first American edition of *The Origin of Species* appeared in 1860, but it is quite probable that, not being hindered by any religious prejudices, he immediately accepted Darwin's theories, which were so close to his

own" (51). By the 1891 edition we're exploring at present, he has drafted an explicit mission statement for the book entitled "L. of G.'s Purport" that includes one of the poetry's half-dozen explicit references to "evolution":

Haughty this song, its words and scope,
To span vast realms of space and time,
Evolution—the cumulative—growths and generations.

In this context the concept of evolution fits nicely with his previously-established love of wondering at the grandeur of nature. This is also apparent in "Grand is the Seen" when he marvels, "Grand is the earth, and grand are lasting time and space, / And grand their laws, so multiform, puzzling, evolutionary." Here, in fact, "evolutionary" refers to nature beyond living organisms; he similarly extends it to the "universal" itself in "Song of the Universal" 2: "For it the mystic evolution, / Not the right only justified, what we call evil also justified."

This last point is significant. The theory of evolution has been controversial since its earliest proposals not only because, like astronomy and geology before it, it displaces Earth and thus humanity from the sacred center of the cosmos, but because it does away with the barrier between humans and animals. Where Genesis 1:27 teaches that "God created man in his own image" (King James Version), and Genesis 3:19 implies that death came into the world due to humanity's sins, the theory of natural selection says not only that humanity developed gradually from millions of generations of ancestral species, but that millions of deaths were therefore a necessary precursor to our existence. The idea that death could not only befall "innocent" life prior to humanity's Original Sin, but could in fact serve a positive function in humanity's development, was shockingly offensive to some. To Whitman, however, in "the mystic evolution... what we call evil [is] also justified."

As part of his embrace of the theory of evolution, controversy and all, Whitman takes it a step beyond what Darwin and his colleagues argued. Instead of interpreting the survival of fitter organisms and the failure of others as a product of random chance, he continues to imply that the world is progressing purposefully forward. That is, the theory of evolution doesn't suggest teleologically that species necessarily develop in the direction of greatness, only that they continuously adapt to their environments at the level of populations or else die out. In *Leaves of Grass*, however, the very cosmos work continuously toward a glorious future. See, for instance, "Going Somewhere":

"Of all Geologies—Histories—of all Astronomy—of Evolution, Metaphysics all,
"Is, that we all are onward, onward, speeding slowly, surely bettering,
"Life, life an endless march, an endless army, (no halt, but it is duly over,)
"The world, the race, the soul—in space and time the universes,
"All bound as is befitting each—all surely going somewhere."

Whitman extends this concept backward in time as well, claiming that humanity is not only the apex of biological evolution but the universe's reason for being:

For it [a man's body] the globe lay preparing quintillions of years without one animal or plant,
For it the revolving cycles truly and steadily roll'd.

"I Sing the Body Electric" 7

"Song of Myself" drives home Whitman's faith in and wonder at the power of evolution to bring his own being into existence out of the mating of generations of animals: "Out of the dimness opposite equals advance, always substance and increase, always sex / Always a knit of identity, always distinction, always a breed of life" (3). This connection to animals is the subject of "Song of Myself" 32 as well: "I think I could turn and live with animals," he notes; "they show their relations to me and I accept them, / They bring me tokens of myself, they evince them plainly in their possession." In 44 he continues, "Births have brought us richness and variety, /

and other births will bring us richness and variety.” Taken together, all these statements affirm a belief in the interconnectedness of all animal species through the processes of sex, birth, differentiation, and ultimately the “knit of identity” as time passes.

The Human Body

I too had receiv'd identity by my body

“Crossing Brooklyn Ferry” 5

As human beings, each of us is naturally most intimately familiar with the biology of our own species: we experience the world through our physical senses, respond to stimuli viscerally as well as intellectually, and must manage our various appetites each day. One could argue that all poetry—indeed, all language, all behavior—is an expression of the human condition, which is fundamentally based in our bodies.

Whitman is known for taking on the subject of our bodily experiences with a remarkable boldness. Some poems in *Leaves of Grass* are so explicit in their expressions of lust and their insinuations of sexual behavior that contemporary critics decried certain “lewd” elements and in 1882 the Watch and Ward Society succeeded in legally banning the book’s sixth edition in Boston (Miller 15). Of particular note is the section “Calamus,” which many literary scholars have argued is a covert ode to homosexuality.

These interpretations are quite legitimate, but the criticisms that frame *Leaves of Grass* as disrespectful in their sensuality are ironic insofar as its poems are rapturously respectful of the human form. That is to say, the aspects of the human body and sexuality that some more conservative critics might dismiss as “animal” or denounce as “sinful” are celebrated without

shame in Whitman's poetry. Unlike Gnostics, he doesn't believe that the body is a burden on the soul; unlike more conservative sects of Christianity, he doesn't consider it a source of temptation for the soul to resist. To the contrary, he recognizes that our very sense of self derives as much from our bodies as from our souls:

I too had receiv'd identity by my body,
That I was I knew was of my body, and what I should be I knew I should be of my body.

"Crossing Brooklyn Ferry" 5

Similarly, in "I Sing the Body Electric" 9 he cries out, "O my body! ... I believe the likes of you are to stand or fall with the likes of the soul, (and that they are the soul,)." The body is thus unequivocally the soul's peer in his view.

But this poetry exists to do more than convey Whitman's personal point of view. He also claims to speak for others who have overcome Puritanical prejudices and fully embraced their bodies as they are, yet don't feel free to express their physicality in the face of society's condemnation or censorship:

Through me forbidden voices,
Voices of sexes and lusts, voices veil'd and I remove the veil,
Voices indecent by me clarified and transfigur'd.

I do not press my fingers across my mouth,
I keep as delicate around the bowels as around the head and heart,
Copulation is no more rank to me than death is.

"Song of Myself" 24

It seems Whitman intends to be a vanguard for a bold new American society as it shakes off the burden of prudish conventions to fully accept our species' physicality. To that end he invites those who have thus far been intimidated by bodies to explore this aspect of human existence:

Touch me, touch the palm of your hand to my body as I pass,
Be not afraid of my body.

“As Adam Early in the Morning”

While mentions of “sexes and lusts,” not to mention “the bowels,” may strike critics as pointlessly crude, Whitman is deliberately striding into the realm of “forbidden” terms to reclaim human biology in its entirety. Ultimately he expresses that the body isn’t an insult to the soul but literally sacredness incarnate: “I believe in the flesh and the appetites, / Seeing, hearing, feeling, are miracles, and each part and tag of me is a miracle” (“As Adam Early in the Morning”).

All told, *Leaves of Grass* goes beyond dispelling shame and fear around our bodies to depict them as not merely acceptable but venerable. “If any thing is sacred the human body is sacred,” Whitman writes in “I Sing the Body Electric” 8. Furthermore, this is true of all people, not just a worthy few who have managed to avoid some carnal corruption: “The man’s body is sacred and the woman’s body is sacred, / No matter who it is, it is sacred” (“I Sing the Body Electric” 6).

If there’s any ambiguity about the significance of the word “sacred” in these contexts, Whitman’s intentions are made clear in “Song of Myself” 24 when he describes his body as downright worthy of worship:

Divine am I inside and out, and I make holy whatever I touch or am touch’d from,
The scent of these arm-pits aroma finer than prayer,
This head more than churches, bibles, and all the creeds.

If I worship one thing more than another it shall be the spread of my own body, or any part of it,
Translucent mould of me it shall be you!
Shaded ledges and rests it shall be you!
Firm masculine colter it shall be you!
Whatever goes to the tilth of me it shall be you!
You my rich blood! your milky stream pale strippings of my life!
Breast that presses against other breasts it shall be you!
My brain it shall be your occult convolutions!

Root of wash'd sweet-flag! timorous pond-snipe! nest of guarded duplicate eggs! it shall be you!

Whitman reveres all parts of his anatomy without shame or prejudice, including his reproductive organs. Still, his references to sexuality are here expressed in metaphor: “colter” means the tip of a plow that penetrates the soil to prepare it for seeds; “tilth” and “milky stream pale strippings” imply fertility and ejaculation. We can turn to even more explicitly sexual passages elsewhere:

Sex contains all, bodies, souls,
Meanings, proofs, purities, delicacies, results, promulgations,
Songs, commands, health, pride, the maternal mystery, the seminal milk,
All hopes, benefactions, bestowals, all the passions, loves, beauties, delights of the earth,
All the governments, judges, gods, follow'd persons of the earth,
These are contain'd in sex as parts of itself and justifications of itself.

Without shame the man I like knows and avows the deliciousness of his sex,
Without shame the woman I like knows and avows hers.

“A Woman Waits For Me”

“Without shame,” then, Whitman celebrates his body from his brain to his breast, his mouth to his bowels, his arm-pits to his “nest of guarded duplicate eggs.” Sexuality is certainly relevant, but the recurring theme is not a crass fascination for the sake of shock or titillation, but a genuine appreciation for reproduction as one of the many wonders of physiology. He writes with the same enthusiasm about the body’s less controversial components, like muscle, bone, and fat: “Muscle and pluck forever!” he cries in “Song of Broad-Axe” 4, while in “Song of Myself” 20 he declares that “Having pried through the strata, analyzed to a hair, counsel’d with doctors and calculated close, / I find no sweeter fat than sticks to my own bones.”

All told, he depicts the body as a landscape of miracles large and small, from its ability to consume elements of the world around it and convert it to energy and new mass—“Who goes

there? hankering, gross, mystical, nude; / How is it I extract strength from the beef I eat?"

("Song of Myself" 20)—to its ability to inhale, exhale, and circulate blood:

The heart, to jet the all-alike and innocent blood!
To breathe the air, how delicious!
To speak—to walk—to seize something by the hand!
To prepare for sleep, for bed, to look on my rose-color'd flesh!
To be conscious of my body, so satisfied, so large!

"Song at Sunset"

He also praises "the subtle nourishment of the air" in "Not Heaving From My Ribb'd Breast Only," where he connects the phenomenon to "the curious systole and diastole" of his heart, which supplies "this beating and pounding at my temples and wrists" as blood circulates to supply "the limbs and senses of my body."

Ultimately nowhere is Whitman more thorough in his reverent description of the human body than in "I Sing the Body Electric" 9, where he essentially names our anatomy from head to toe with an impressive level of detail. The takeaway is clear: all people, and all their parts, are equally magnificent and worthy of praise:

Head, neck, hair, ears, drop and tympan of the ears,
Eyes, eye-fringes, iris of the eye, eyebrows, and the waking or sleeping of the lids,
Mouth, tongue, lips, teeth, roof of the mouth, jaws, and the jaw-hinges,
Nose, nostrils of the nose, and the partition,
Cheeks, temples, forehead, chin, throat, back of the neck, neck-slue,
Strong shoulders, manly beard, scapula, hind-shoulders, and the ample side-round of the chest,
Upper-arm, armpit, elbow-socket, lower-arm, arm-sinews, arm-bones,
Wrist and wrist-joints, hand, palm, knuckles, thumb, forefinger, finger-joints, finger-nails,
Broad breast-front, curling hair of the breast, breast-bone, breast-side,
Ribs, belly, backbone, joints of the backbone,
Hips, hip-sockets, hip-strength, inward and outward round, man-balls, man-root,
Strong set of thighs, well carrying the trunk above,
Leg-fibres, knee, knee-pan, upper-leg, under-leg,
Ankles, instep, foot-ball, toes, toe-joints, the heel;
All attitudes, all the shapeliness, all the belongings of my or your body or of any one's body,
male or female,
The lung-sponges, the stomach-sac, the bowels sweet and clean,
The brain in its folds inside the skull-frame,

Sympathies, heart-valves, palate-valves, sexuality, maternity,
Womanhood, and all that is a woman, and the man that comes from woman,
The womb, the teats, nipples, breast-milk, tears, laughter, weeping, love-looks, love-
perturbations and risings,
The voice, articulation, language, whispering, shouting aloud,
Food, drink, pulse, digestion, sweat, sleep, walking, swimming,
Poise on the hips, leaping, reclining, embracing, arm-curving and tightening,
The continual changes of the flex of the mouth, and around the eyes,
The skin, the sunburnt shade, freckles, hair,
The curious sympathy one feels when feeling with the hand the naked meat of the body,
The circling rivers the breath, and breathing it in and out,
The beauty of the waist, and thence of the hips, and thence downward toward the knees,
The thin red jellies within you or within me, the bones and the marrow in the bones,
The exquisite realization of health;
O I say these are not the parts and poems of the body only, but of the soul,
O I say now these are the soul!

IV. Interpreting Whitman's Worldview

The World as Knowable: The Scientific Method

Where has fail'd a perfect return indifferent of lies or the truth?

“All is Truth”

Thus far we've demonstrated Whitman's enthusiasm for science by surveying the instances in which his poetry references the theories and discoveries of his contemporaries in the fields of physics, astronomy, geology, and biology. My conclusion is that *Leaves of Grass* depicts a world that aligns with the cosmology of nineteenth-century scientists, often drawing on their jargon to do so in an indication of respect and acceptance.

This essentially corresponds to the findings of such Whitman scholars as Beaver, Cooke, and Dugdale—but I would go further. That is, I find that Whitman goes beyond accepting the concept of an Old Earth and the evolution of species, which is to say, scientists' published conclusions. He also recognizes and embraces the scientific method itself: the world is knowable and comprehensible to those who interrogate it by formulating testable hypotheses, conducting experiments, measuring outcomes, and holding their results to the standards of reason and repeatability.

His embrace of the scientific method is especially clear in the poem “Tests”:

Not traditions, not the outer authorities are the judges,
They [tests] are the judges of outer authorities and of all traditions,
They corroborate as they go only whatever corroborates themselves, and touches themselves;
For all that, they have it forever in themselves to corroborate far and near without one
exception.

Whitman is here declaring his confidence in the reliability of experimentation and thus in the basic trustworthiness of the physical realm. This confidence may seem obvious enough or easy

to take for granted in our current secular society, but it represents a worldview that has only developed relatively recently in Western civilization, and only influenced literature and poetry more recently still. Unlike religious doctrines or individuals who believe that the world is “fallen” and inherently corrupt, and that truth can only be received through revelation directly from a higher, divine source, Whitman expresses a belief that everything around us bears witness to truth. To wit, in “All Is Truth” he writes:

Where has fail'd a perfect return indifferent of lies or the truth?
Is it upon the ground, or in water or fire? or in the spirit of man? or in the meat and blood?
.....
[I see] that each thing exactly represents itself and what has preceded it,
And that the truth includes all, and is compact just as much as space is compact,
And that there is no flaw or vacuum in the amount of the truth—but that all is truth without
exception

These lines express an unprejudiced faith in the discoveries of the physical sciences, in which every “thing exactly represents itself and what has preceded it.” In an era when the centuries-old friction between men of faith and men of science was heightened with each additional unbiblical hypothesis, “All Is Truth” affirms that the nature of reality is independent of our disputes. The world is “indifferent” to what we label “lies or the truth”; it simply is as it is. This conviction is reiterated in “Song of Myself” 30, where we see that

All truths wait in all things,
They neither hasten their own delivery nor resist it,
They do not need the obstetric forceps of the surgeon

Whereas the surgeon’s “obstetric forceps” would attempt to extract truth from nature, truth requires no such intervention on our part. Here too truth demonstrates indifference to human study and argument, which are irrelevant to its full “delivery” in the world.

It follows that, rather than struggle against nature in defense of what we believe or wish to be true, we should approach the world with an open mind, investigating it with the

aforementioned “tests” and accepting that “there is no flaw” in what we find. Whitman reaffirms this position in “Song of Myself” 23:

I accept Reality and dare not question it,
Materialism first and last imbuing.

Hurrah for positive science! long live exact demonstration!

.....
This is the geologist, this works with the scalpel, and this is a mathematician.

Gentlemen, to you the first honors always!

The reference to “positive science” is particularly significant: the philosophical system of positivism asserts that we can know the world through our direct experience of natural phenomena. Whitman follows this phrase with “exact demonstration,” an obvious reference to the careful accuracy of “the geologist,” the surgeon, and the “mathematician” as they investigate the world around us. Ultimately the poem heaps praise and “honors” on scientists and their work, acknowledging that through their experiment they arrive at “Reality.”

The World as Unknowable: Materialism v. Metaphysics

Beyond thy telescope or spectroscope observer keen, beyond all mathematics

“Eidólons”

Of course, “Reality” is no simple matter, particularly not in Whitman’s soaring imagination. As often as his poetry affirms that the material world can be interrogated and understood through the scientific method, it doubles back to express a mystical sense that the cosmos possesses ineffable qualities beyond physical exploration or explanation.

See, for instance, the poem “Eidólons,” whose title and theme reference the ancient Greek concept of phantoms, or possibly the broader concept of invisible ideals—regardless,

intangible and mysterious entities. In it Whitman meets “a seer, / Passing the hues and objects of the world” in order to “glean eidólons.” The poem is composed of short fragments stacked in a long string, some lines only three or four words long in contrast to Whitman’s characteristic rambling free-form; the result is a poem that maintains its mystique through fragmented thoughts rather than complete statements or conclusions. “Exaltè, rapt, ecstatic,” he writes, “The visible but their womb of birth”; “Not this the world, / Nor these the universes,” but only “Eidólons, eidólons.” In one of the more pointed passages he describes men of science, and while he doesn’t dismiss their value, he clearly calls the reader to seek truth in an ineffable realm “beyond” their work:

Beyond thy lectures learn’d professor,
Beyond thy telescope or spectroscope observer keen, beyond all mathematics,
Beyond the doctor’s surgery, anatomy, beyond the chemist with his chemistry,
The entities of entities, eidólons.

In “Song of the Universal” 2, as well, Whitman acknowledges science with respect before moving past it to an apparently higher plane beyond its reach:

Lo! keen-eyed towering science,
As from tall peaks the modern overlooking,
Successive absolute fiats issuing.

Yet again, lo! the soul, above all science,
For it has history gather’d like husks around the globe,
For it the entire star-myrriads roll through the sky.

Here, scientific study is “keen-eyed” and able to see far and wide across the world from its vantage point, “towering” and “tall.” In fact, the ability to issue “fiats” indicates that scientists possess a great deal of authority, although those fiats’ “successive” nature could imply either that science is ever-productive, constantly discovering yet more truths about the world—or that it is ever correcting itself with revisions, in which case it must be somewhat untrustworthy

as an imperfect work in progress. Either way, the soul is “above all science”: Earth itself (“the globe”) and the entire universe of rolling stars exist “For it,” which suggests that ultimately humanity’s true nature is found through the soul rather than the intellect.

Given the importance Whitman places on the “soul,” it’s worth exploring what the word signifies to him, even briefly given its tangential relationship to this study. In short, it’s a bit of everything: the mind, the spirit, the source of one’s identity, that which is everlasting in this world or even immortal in a future world. Arguably “soul” is a catch-all term in *Leaves of Grass* that arises when Whitman needs to express wonder at the mysteriousness of life in its many forms. Take, for instance, “Song at Sunset”:

How the water sports and sings! (surely it is alive!)
How the trees rise and stand up, with strong trunks, with branches and leaves!
(Surely there is something more in each of the trees, some living soul.)

O amazement of things—even the least particle!
O spirituality of things!

In this case as in many others, Whitman’s shift from describing the material world (“things”) to conjecturing that it is imbued with mystical aspects (“O spirituality of things!”) is prompted not by theological reasoning but by an emotional response to first-hand experiences. The water seems lively in its motions and sounds; “surely it is alive!” The trees are beautiful in the light of the setting sun; “Surely there is... some living soul” in them. Even “the least particle” seems almost pantheistically divine to him in this rapturous state.

When such grandiose moods seize Whitman, they prompt him to abandon his dedication to the scientific method and rely instead on instincts that are entirely subjective—though he is no less confident in their conclusions as he reaches them. “I need no assurances, I am a man who is preoccupied of his soul,” he boasts in “Assurances,” “I do not doubt that I am

limitless, and that the universes are limitless, in vain I try to think how limitless.” In “Song at Sunset” he climactically declares “Illustrious every one! / Illustrious what we name space, sphere of unnumber’d spirits, / Illustrious the mystery of motion in all beings, even the tiniest insect.” From particles to insects to celestial bodies, he is exhilarated by existence and the “mystery” of existence.

This exhilaration stands in contrast to the moments when Whitman tires of the tediousness of overly scientific explanations of the world and deliberately chooses to remove himself from their analyses. In “Song of Myself” 3, which opens “I have heard what the talkers were talking,” he muses that “To elaborate is no avail, learn’d and unlearn’d feel that it is so” and says that “while they discuss I am silent, and go bathe and admire myself.” Rather than engage in endless discourse, he concludes “I am satisfied—I see, dance, laugh, sing.” Instead of attempting to understand the world through granular interrogation and experimentation, in these moments of abandon he feels it’s sufficiently fulfilling to develop a vague sense of awe for its vastness.

But as much pleasure as Whitman takes in this mystical sense that he is able to intuitively comprehend the grand complexity of the cosmos through simple flights of fancy, it fails time and again to satisfy him, only leading him to crave concrete answers once more: “I must follow up these continual lessons of the air, water, earth, / I perceive I have no time to lose,” he writes in “Myself and Mine.” And these fits of desire can lead to despair at the ultimate incomprehensibility of the world:

What do I know of life? what of myself?
I know not even my own work past or present,
Dim ever-shifting guesses of it spread before me

“Prayer of Columbus”

O baffled, balk'd, bent to the very earth,
Oppress'd with myself that I have dared to open my mouth,
Aware now that amid all that blab whose echoes recoil upon me I have not once had the least
idea who or what I am,

.....
I perceive I have not really understood any thing, not a single object, and that no man ever can

“As I Ebb'd with the Ocean of Life”

Although Whitman strives to capture and convey the true nature of the world across the length of *Leaves of Grass*, drawing heavily on scientific theories where he can and supplementing his efforts with emotional outpourings, ultimately he despairs that the world is not fully knowable. His struggles along the way result in moments of cognitive dissonance and downright contradiction as he alternately attempts to learn and express all truth, and throws up his hands in surrender.

See, for instance, “There Was a Child Went Forth,” in which he worries that his longing to comprehend the world is doomed to go unsatisfied, not for lack of effort, but because the world itself simply defies all comprehension:

Affection that will not be gainsay'd, the sense of what is real, the thought if after all it should
prove unreal,
The doubts of day-time and the doubts of night-time, the curious whether and how,
Whether that which appears so is so, or is it all flashes and specks?

This worry is most starkly expressed in “Of the Terrible Doubt of Appearances”:

Of the terrible doubt of appearances,
Of the uncertainty after all, that we may be deluded,
.....
May-be the things I perceive, the animals, plants, men, hills, shining and flowing waters,
The skies of day and night, colors, densities, forms, may-be these are (as doubtless they are)
only apparitions, and the real something has yet to be known,
(How often they dart out of themselves as if to confound me and mock me!
How often I think neither I know, nor any man knows, aught of them,)

May-be seeming to me what they are (as doubtless they indeed but seem) as from my present point of view, and might prove (as of course they would) nought of what they appear, or nought anyhow, from entirely changed points of view

To assuage the anxiety of these doubts about the material world, Whitman repeatedly expresses faith in the aforementioned soul, celebrating the physical sciences as far as their accomplishments reassure him and returning as needed to a rather chaotic and ill-defined spirituality to pick up the slack. Again, a full analysis of Whitman's conception of the soul is beyond the scope of the present study, but its relevance to his scientific worldview are succinctly conveyed in "A Song of Joys":

O the joy of my soul leaning pois'd on itself, receiving identity through materials and loving them, observing characters and absorbing them,
My soul vibrated back to me from them, from sight, hearing, touch, reason, articulation, comparison, memory, and the like,
The real life of my senses and flesh transcending my senses and flesh,
My body done with materials, my sight done with my material eyes,
Proved to me this day beyond cavil that it is not my material eyes which finally see,
Nor my material body which finally loves, walks, laughs, shouts, embraces, procreates.

Here Whitman presents a potential solution to his occasional fear that, much as he thrills in and learns from his direct experience of the physical world, his senses may be untrustworthy. An unprovable but beloved belief in the metaphysical realm, particularly a soul "transcending my senses and flesh," allows him to be "done with materials" as needed (although he gives no explanation of how he "walks, shouts, embraces," and even "procreates" without or beyond his beloved "material body").

In "Song of the Open Road" 6 he similarly declares that

Wisdom is of the soul, is not susceptible of proof, is its own proof,
Applies to all stages and objects and qualities and is content,
Is the certainty of the reality and immortality of things, and the excellence of things;
Something there is in the float of the sight of things that provokes it out of the soul.

This poem again praises “things”—the “reality and immortality of things,” “the excellence,” their power to provoke wisdom in the soul through sensory experience (“sight”). And yet it is dismissive of the “proof” of the physical world, and our ability to find “certainty” and “reality” through its study, which presents a stark contrast to Whitman’s many, many other passages praising the power of the scientific method. Despite being interspersed with odes to science, it and similar lines elsewhere seem like sporadic declarations of a religious worldview. Indeed, at one point Whitman explicitly claims that “I too, following many and follow’d by many, inaugurate a religion” (“Starting from Paumanok” 7).

So which is it? *Leaves of Grass* may break ground as a body of poetry whose worldview is rooted in the scientific method, but it’s clearly still steeped in ideas that are unscientific—not necessarily anti-science, but troubled by science’s limits and thus supplementing it with metaphysical concepts like souls, spirituality, and sacredness. Whitman’s poetry praises science, but is not simplistically devoted to it as the final source of truth.

Of course, neither is Whitman a devotee of religion as the final source of truth. To grasp the full richness of Whitman’s beliefs, let’s now explore the role of religion in *Leaves of Grass*.

Whitman on Organized Religion

The whole earth and all the stars in the sky are for religion’s sake

“Starting From Paumanok” 7

References to organized religion appear as regularly and as explicitly in *Leaves of Grass* as those to science, and they’re not limited to expressions of the Christian tradition in which Whitman was raised. To the contrary, Whitman’s mentions of religious traditions are often

deliberate gestures toward inclusiveness across diverse cultures, acknowledgements of humanity's far-ranging systems of belief around the globe and invitations for people of all faiths to partake of his poetry. As in so many of his list-like poems, Whitman makes a conscious effort to include as many iterations as he can in "With Antecedents" 2:

I have the idea of all, and am all and believe in all,
I believe materialism is true and spiritualism is true, I reject no part.
.....
I respect Assyria, China, Teutonia, and the Hebrews,
I adopt each theory, myth, god, and demi-god,
I see that the old accounts, bibles, genealogies, are true, without exception

Clearly these mentions are less a declaration of personal faith or even an admission of agnosticism than they are an effort to include every form of human experience in his songs. The phrases "I respect," "I adopt," and "I see" are terms of acknowledgement, not enthusiastic belief. "I reject no part" suggests not that Whitman has strong faith in any of these ideologies but that he chooses not to alienate any readers by excluding their beliefs from his poetry.

In "Song of Myself" 43 Whitman similarly calls out to diverse clergy with more enthusiasm for their inclusion than for their creeds: the poem begins "I do not despise you priests, all time, the world over," then launches into an elaborate description of the various beliefs and practices with which he is familiar, from "Watching responses from oracles" to "Making a fetich of the first rock or stump, powowing with sticks in the circle of obis, / Helping the llama or brahmin." A fifteen-line string of praise for people of faith, contradictory as the details of their faiths may be, is followed by a series of short stanzas on "Down-hearted doubters dull and excluded," "dishearten'd, atheistical." While Whitman's stated goal may be to "take my place among you as much as among any," it's clear from his dark description of the faithless what he truly feels about their state: "Frivolous, sullen, moping, angry," they

“contort... with spasms and spouts of blood” in their apparently futile and distressed quest for meaning outside spirituality. A lack of faith, then, is tragic and foolish. In the short poem “O Me! O Life!” he reiterates this when he despairs “Of the endless trains of the faithless, of cities fill’d with the foolish, / Of myself forever reproaching myself, (for who more foolish than I, and who more faithless?).”

Whitman’s easy embrace of diverse religious systems from across the continents, coupled with his sweeping denigration of all “doubters,” suggest that in his view faith for faith’s sake is vital, but the particular object of one’s faith is of secondary importance. What matters is not that specific scriptures are revered or a specific deity is worshiped as divine above all else, but that people appreciate the existence of the sacred. See “A Song of Occupations” 3:

We consider bibles and religions divine—I do not say they are not divine,
I say they have all grown out of you, and may grow out of you still,
It is not they who give the life, it is you who give the life

That is, bibles and their beliefs are part of this sacred scheme, but only insofar as they derive from human experience: “it is you who give the life.” Holy books aren’t inherently holy; they are vehicles of truth, but not its sole repository or its source. The source is we ourselves as humans and our direct engagement with the world around us.

This idea is reinforced in “A Song for Occupations” 2 when he affirms outright that some truths are so mystical that they evade capture in words and demand firsthand experience:

There is something that comes to one now and perpetually,
It is not what is printed, preach’d, discussed, it eludes discussion and print,
It is not to be put in a book, it is not in this book

If some truth can't "be put in a book," it must be our responsibility to venture forth and discover it directly. Thus in "Song of the Open Road" 9 he encourages readers to interrogate the world around us relentlessly:

The earth is rude, silent, incomprehensible at first, Nature is rude and incomprehensible at first,
Be not discouraged, keep on, there are divine things well envelop'd,
I swear to you there are divine things more beautiful than words can tell.

Even a simple walk outdoors "seems to me more than all the print I have read in my life" ("Song of Myself" 13). In all their length and complexity, theological discourses often express less than physical encounters with nature, as in "I Sing the Body Electric" 2 when "To see [a person] pass conveys as much as the best poem, perhaps more." Nature, not scripture, is ultimately the source of all knowledge and understanding: "If you would understand me go to the heights or water-shore, / The nearest gnat is an explanation, and a drop or motion of waves is key" ("Song of Myself" 47). After all, while we humans use words to comprehend and communicate about reality, they are mere tools; as we saw previously, reality itself is indifferent to our jargon and endures beyond our analyses:

Air, soil, water, fire—those are words,
I myself am a word with them—my qualities interpenetrate with theirs—my name is nothing to them,
Though it were told in the three thousand languages, what would air, soil, water, fire, know of my name?

"A Song of the Rolling Earth" 1

In "Song of the Open Road" 6 as well, Whitman claims that wisdom "cannot be pass'd from one having it to another not having it," suggesting that true understanding is not to be found in religious institutions and their teachings but in each individual's first-hand experience of sacredness: "Now I re-examine philosophies and religions, / They may prove well in lecture-rooms, yet not prove at all under the spacious clouds." Thus in religion (questions of faith) as in

science (matters of experimental investigation), nature itself is the “primary source” of truth. The vault of celestial bodies overhead is as much a cathedral for spiritual revelations as it is a laboratory for astronomical discoveries:

The sun and stars that float in the open air,
The apple-shaped earth and we upon it, surely the drift of them is something grand,
I do not know what it is except that it is grand, and that it is happiness

“A Song for Occupations” 3

This need for a direct, almost transcendent experience of the natural world is the main theme of “When I Heard the Learn’d Astronomer,” in which Whitman abandons the lecture hall’s claustrophobic enclosures to walk beneath the open night sky:

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, divide, and measure 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.

In short, Whitman embraces religious institutions and their clergy as much as he embraces scientific institutions and their investigators—and he rejects them both in turn. Ultimately what he craves is a visceral encounter with truth, whether it’s made known to him through the spiritual revelation of a gut feeling or the “physical revelation” of a physicist, astronomer, geologist, or biologist reporting his findings to an amazed audience. Both religion and science lose their appeal to him when they become stuffy and abstract, too tangled in the fine points of indoor debates. His interest ends at wonder:

Gentlemen [scientists], to you the first honors always!
Your facts are useful, and yet they are not my dwelling,
I but enter by them to an area of my dwelling.

What then, is Whitman’s area of dwelling? Poetry, of course. Where clergy have been the leaders of the old religions, and scientists have created a counter-movement rooted in physical facts, he envisions a future in which poets become the leaders of a new comprehensive scientific spirituality or spiritual science that draws on the best of both. As a poet himself, Whitman concludes that it is his role to preach this vision, a prophet of truth in all forms:

Brain of the New World, what a task is thine,
To formulate the Modern—out of the peerless grandeur of the modern,
Out of thyself, comprising science, to recast poems, churches, art,
(Recast, may-be discard them, end them—may-be their work is done, who knows?)

“Thou Mother with Thy Equal Brood” 3

V. The Area of Whitman's Dwelling

Poetry as Perfect Synthesis

The words of true poems are the tuft and final applause of science

"Song of the Answerer" 2

When Whitman writes of recasting and perhaps discarding religions, musing that "maybe their work is done," some scholars take him at his word. Cooke, for instance, declares that there's "no doubt of his conviction that modern science rather than theology offers the key to the knowable universe" ("Whitman's Indebtedness" 112). I would argue that this conclusion neglects Whitman's discomfort with science as the ultimate answer, as evidenced by his repeated returns to religion and spirituality when science fails to satisfy him. When his work is taken in its entirety, he doesn't suggest that religion is utterly useless and science has superseded it, taking its place in the lives of individuals and society as a whole. To the contrary, throughout *Leaves of Grass* he continues to draw on the wisdom of ancient traditions to inform a new and more evolved worldview. See again "Eidólons":

Based on the ancient pinnacles, lo, newer, higher pinnacles,
From science and the modern still impell'd,
The old, old urge, eidólons.

Human understanding has always been in the process of developing toward truth, a journey that continues today as we build on "ancient pinnacles," which serve a vital purpose in enabling us to reach "newer, higher pinnacles," namely "science and the modern." Thus the quest for truth calls on *both* our old religious heritages as "base" and the newer scientific approaches built atop them. See "Song of the Exposition" 6, in which he outlines a cultural vision for his modern nation:

In large calm halls, a stately museum shall teach you the infinite lessons of minerals,
In another, woods, plants, vegetation shall be illustrated—in another animals, animal life and
development.

One stately house shall be the music house,
Others for other arts—learning, the sciences, shall all be here,
.....
(This, this and these, America, shall be your pyramids and obelisks,
Your Alexandrian Pharos, gardens of Babylon,
Your temple at Olympia.)

If science and knowledge are the wonders of the modern world just as massive monuments and temples were the wonders of the ancient world, it may seem at first that institutions of secular learning are here supplanting outdated places of worship. But it would be more appropriate to say that contemporary accomplishments have developed *from* historic accomplishments.

Still, although science has evolved from and beyond religion, I argue that Whitman believes it is not itself our final, fully-formed cosmology. Here Beaver would agree: “Walt Whitman never said anything flatly opposed to science.... The only reservation Whitman makes is that there is something beyond and above science” (*Poet of Science* 131). Whitman praises scientific study as useful for the knowledge it reveals, but notes that it, too, falls short: its investigations and analyses offer facts, but not truth in all its fullness, since they fail to account for our spiritual experiences or provide meaning in and of themselves. For this reason scientific understanding cannot serve as our ultimate goal so much as an important tool along the way. As Asselineau notes, “Such was [Whitman’s] point of view all his life: science is only a stage at which we must not stop” (44).

By way of example, see “Beginning My Studies,” a short poem that celebrates the thrill of experiencing and exploring the natural world:

Beginning my studies the first step pleas’d me so much,
The mere fact consciousness, these forms, the power of motion,

The least insect or animal, the senses, eyesight, love,
The first step I say awed me and pleas'd me so much,
I have hardly gone and hardly wish'd to go any farther,
But stop and loiter all the time to sing it in ecstatic songs.

At a glance this poem expresses the simple and familiar notion that Whitman appreciates nature and his "studies" of it. But the implication of the last line is critical: that study's value lies in its contribution to his "ecstatic songs." Science serves poetry: it allows us to learn about the marvels of the universe, which in turn provide inspiration for our writing.

See also "Song of the Answerer" 2:

Divine instinct, breadth of vision, the law of reason, health, rudeness of body, withdrawnness, Gayety, sun-tan, air-sweetness, such are some of the words of poems.

The sailor and traveler underlie the makers of poems, the Answerer,
The builder, geometer, chemist, anatomist, phrenologist, artist, all these underlie the maker of poems, the Answerer.

Here his subjective, even spiritual experiences of "vision," "air-sweetness," and "rudeness of body" exist to become "the words of poems." So, too, does objective science: the "geometer, chemist, anatomist, phrenologist" all represent valuable figures not for their own sake, but insofar as they "underlie the maker of poems."

Thus we see that for Whitman, science, like religion, is the means to an end. While both religion and science are marvelous human accomplishments, *Leaves of Grass* makes clear that neither is sufficient alone: a dogmatic devotion to metaphysical doctrines blinds us to the power and beauty of the physical world, while a purely materialistic approach to scientific study drains the cosmos of its magnificence by reducing it to statistics and debate.

Beaver and Asselineau have reached similar points in their critiques, acknowledging that science didn't trump religion in Whitman's mind so much as supplement it and suggest that truth lies beyond the reach of either alone. But here they were content to conclude on vague

terms. While Beaver notes that Whitman believes science is meant “to feed this higher, deeper something,” he’s unclear as to what that might be: “On occasion this something was the soul,” or it could revert to “religion, or ‘the Science of God’; always, however, there is the idea of progression, and in this progression modern science is the penultimate achievement” (*Poet of Science* 131). Asselineau is even less clear, noting merely that “Despite its unity, *Leaves of Grass* has, of course, neither the rigor nor the cohesion of a philosophical system,” replete as it is with unresolved “contradictions and paradoxes” (257). This supposed weakness is a main focus of Foerster’s assault on Whitman’s work as a misguided “Cult of Confusion” in which he enjoys the “blurring of things unlike” and takes “impressionistic ecstasy in contemplating the blur” (“Cult of Confusion” 800).

I would argue, rather, that Whitman *does* provide an answer to the question he poses as to the roles of religion and science in capturing truth. Science is “penultimate” to humanity’s ultimate achievement: poetry, which combines and resolves the two. “For the great Idea, / That, O my brethren, that is the mission of poets” (“By Blue Ontario’s Shore” 11). “Song of the Answerer” 2 elaborates on this mission:

...the words of the maker of poems are the general light and dark,
 The maker of poems settles justice, reality, immortality,
 His insight and power encircle things and the human race,
 He is the glory and extract thus far of things and of the human race.

 All this time and at all times wait the words of true poems,
 The words of true poems do not merely please,
 The true poets are not followers of beauty but the august masters of beauty;
 The greatness of sons is the exuding of the greatness of mothers and fathers,
 The words of true poems are the tuft and final applause of science.

There it is: “The words of true poems are the tuft and final applause of science.” Religion asserts a mystical, metaphysical worldview; science necessarily responds to its excessive

abstractions by bringing it back to earth; poetry integrates the contributions of both and thereby expresses the fullest possible truth about the world and human experience in it.

This is not to say that any small song or rhyming verse qualifies. Only truly great poetry is worthy of these claims, just as timeless theology is upheld in heated debates and scientific hypotheses are subjected to rigorous testing. Whitman offers a rubric for great poetry in “By Blue Ontario’s Shore” 12:

Is it [one’s poetry] not a mere tale? a rhyme? a prettiness?—is the good old cause in it?
.....
Does it not assume that what is notoriously gone is still here?
Does it answer universal needs? will it improve manners?
.....
Can your performance face the open fields and the seaside?
Will it absorb into me as I absorb food, air, to appear again in my strength, gait, face?
Have real employments contributed to it? original makers, not mere amanuenses?
Does it meet modern discoveries, calibres, facts, face to face?

In poem 13 he continues, “Rhymes and rhymers pass away, poems distill’d from poems pass away”—only the most excellent poetry is capable of synthesizing religion and science to arrive at great truths and be worthy of the people. And only a rare, great poet is capable of communicating such wisdom, prophet-like:

He is no arguer, he is judgment, (Nature accepts him absolutely,
He judges not as the judge judges but as the sun falling round a helpless thing,
As he sees the farthest he has the most faith,
His thoughts are the hymns of the praise of things

Leaves of Grass as an Evolving Lifeform

After the noble inventors, after the scientists, the chemist, the geologist, ethnologist,
Finally shall come the poet worthy that name,
The true son of God shall come singing his songs.

“Passage to India” 7

It's easy enough to identify the flaws and drawbacks inherent in pure religion and science respectively. But why should we accept Whitman's assertion that poetry is the answer? What is so particular about lines of free-flowing verse that empowers them to merge and transcend this dichotomy?

Like religion, poetry consists entirely of ideas: it exists in the invisible realm of language, and its words convey abstract concepts and make moral claims. Poems are intangible imaginings spun from the mystery of consciousness, what could be called the soul.

At the same time, poetry is so deeply rooted in the material world that it is written on "grass" itself, "leaves" of paper produced from tree pulp. Whitman's brief poem entitled "What Think You I Take My Pen in Hand?" reminds us that he handcrafted each poem from pen and ink, a process as simple and tangible as planting a seed. The act of writing captures ideas and gives them substance, eventually solidifying them as weighty books:

You shall watch how the printer sets type, and learn what a composing-stick is,
You shall mark in amazement the Hoe press whirling its cylinders, shedding the printed leaves
steady and fast

"Song of the Exposition" 5

Furthermore, these poems that are put to paper are inspired by physical experiences perceived with our physical senses, whether external sights and sounds or the gut-wrenching sensation of emotions. Cooke emphasizes this when she notes that according to Whitman's writing, "the poet's approach to gaining that knowledge... [is] to seek meanings directly from nature—to begin, like the scientist, with the concrete and the real" ("A Note on Whitman's Symbolism" 230). See, for instance, "Now Precedent Songs, Farewell," in which Whitman notes that his poetry springs

From fibre heart of mine—from throat and tongue—(My life's hot pulsing blood,
The personal urge and form for me—not merely paper, automatic type and ink,)

Poetry is inspired by physical experiences, composed of sounds made by human mouths, carried by air to others' ears, or else composed of inked lines carried on paper to others' hands and eyes; its existence relies on human flesh. We craft poetry in our "brains," our "lips closed, tympan and temples unstruck, / Until that comes which has the quality to strike and to uncloset"—only then do we "bring forth what lies slumbering forever ready in all words" ("Vocalisms" 2). Without our lips to speak and our ears to hear, our hands to write and our eyes to read, poetry can neither take form nor receive meaning in the reader's mind.

Whitman addresses the physicality of his poetry in several passages where he elides his own voice with the voice of the book he foresees his readers to be holding. Specifically, he addresses readers as if the bound, printed pages have become a body with an identity capable of expressing itself: "Whoever you are holding me now in hand," he begins a poem of the same name,

in any roof'd room of a house I emerge not, nor in company,
And in libraries I lie as one dumb, a gawk, or unborn, or dead

Only when a reader picks up the book, opens the pages, traces her eyes along the words therein—only when a reader physically interacts with the leaves Whitman has "shed"—does print convey meaning and become poetry. Without this physical engagement, his written words remain "unborn, or dead." In the following stanza Whitman emphasizes the intimacy of the relationship formed between poetry and its reader as she carries the book on her person:

[Thrust] me beneath your clothing,
Where I may feel the throbs of your heart or rest upon your hip,
Carry me when you go forth over land or sea;
For thus merely touching you is enough, is best,
And thus touching you would I silently sleep and be carried eternally.

Words on a page “silently sleep” most of the time, but they come alive in the minds of readers through the act of reading.

All this is to say that without our bodies and the surfaces that bear our ink, there could be no poetry. Poetry doesn't float invisibly in some dimension of Platonic ideals, nor is it an intangible prayer in the ether. It is conceived and born through the same physical, chemical, and biological processes studied by scientists. But unlike scientific truths, which we established earlier to exist independent of human study and description, poetic truths require conscious engagement to be awakened or brought to life. Their meaning only exists when lips, ears, air, and eyes conspire to convey their words to our living minds.

The fact that poetry depends on the active engagement of writers and readers renders it an evolving lifeform. This distinguishes it from holy scriptures, which exist in the past tense: the books held as sacred in the “religions of the book” have ceased to develop and make no allowance for new experiences as centuries pass. See Revelation 22:18, which draws the Christian Bible to a close with this ominous warning: “For I testify unto every man that heareth the words of the prophecy of this book, If any man shall add unto these things, God shall add unto him the plagues that are written in this book” (King James Version). The reason, of course, is that the Bible is meant to contain the singular, perfect expression of God's revealed truth. To add to it or alter it would be to corrupt its message by introducing lowly human falsehoods and biased views.

Biased views, in contrast, are the very substance of poetry. It is subjective, personal, and intimate. Poetry is not perfect; it is not static; there is no final definitive version, not even for *Leaves of Grass*, which Whitman cultivated continuously over the course of his life to include

ever more of his experiences and insights. The goal of poetry is never to achieve a single final truth by excluding or silencing competing voices, but to explore every possible intricacy and interpretation of truth by expressing as many voices as possible:

Do I contradict myself?
Very well then I contradict myself,
(I am large, I contain multitudes.)

“Song of Myself” 51

As Whitman has demonstrated, poetry can easily embrace the discoveries of physics, astronomy, geology, and biology in ways Western religion has not, whether because those discoveries threaten the claims of holy books or simply extend beyond the scope of theology. Poetry also lays claim to the soul and spirituality in ways Western science cannot, limited as it is to testable hypotheses and measurable cause and effect. Poetry weaves these seemingly incompatible worldviews together to create a whole that is greater than the sum of its parts, not in spite of the multitudes it contains but because of them.

This, at least, is Whitman’s belief. He sees poetry’s potential to serve as humanity’s grand synthesis and sets out to make it so. Over the course of his lifetime, it is his mission to produce a body of poetry so thorough in its treatment of both the metaphysical and the physical that humanity can use it to evolve beyond both religion and science toward an all-inclusive truth. In short, in humanity’s grand quest to understand the cosmos and our place in it, religion served as our first thesis, crafting theologies and metaphysical doctrines that mystify as much as they explain. Science rose up in response, presenting a materialism that is more comprehensible but potentially dry and devoid of meaning. Poetry serves as a perfect synthesis: only poetry can encompass the totality of human experience, from the physical to the spiritual,

and accept its dissonances by meaningfully wrestling with them and presenting them back to the world, rather than silencing them or ignoring them. As a result, the poet “sees the farthest,” that is, farther than both the original pinnacles of religion and the modern towers of science.

Ultimately *Leaves of Grass* does not embrace a specific worldview, whether religious or scientific; it doesn’t even outline a single cohesive cosmology so much as an acknowledgement that everyone has a different perspective based on his or her different life experiences, and that even a single individual’s beliefs waver from day to day and evolve over the years.

Whitman’s poetry alternately expresses confident materialism, a confident rejection of materialism, and the full spectrum of beliefs in between. And he’s forthcoming in acknowledging these inconsistencies not only when he claims to speak for “multitudes,” but when expressing “Myself and Mine,” in which he essentially admits that the universe’s complexity has overwhelmed his attempts at conveying a cohesive worldview:

I charge you forever reject those who would expound me, for I cannot expound myself,
I charge that there be no theory or school founded out of me,
I charge you to leave all free, as I have left all free.

All is left free: generation by generation, poets are able to write in free verse whatever impression or fear or hope a human may have, constrained neither by priests’ claims of a flawless divine revelation that’s long since concluded, nor by scientists’ carefully calibrated experiments and objective analyses. Poetry gathers truth from every possible source and expresses it in terms that are ambiguous, mysterious, and beautiful, without being constrained by the laws of language and its logical syntax. Its verses can loop back over themselves, create contradictions, despair over them, then flow onward without offering clear answers—a true reflection of the poet’s consciousness rather than an artificially logical and limited philosophy.

Poetry doesn't invite readers to subject their understanding to its dictations, it invites readers to converse with it, imagine its imaginings, ponder its rhetorical questions, and feel its weight and texture in their hands along the way. In this way poetry takes on a life of its own in the mind of the reader, where it lives and grows as an organic experience of truth in unfettered freedom.

This freedom brings us back to poetry as "leaves of grass"—not just tangible paper in our hand, but the continuous outgrowth of living organisms. Unlike outdated religious dogmas that outline a single set of unprovable beliefs coupled with a "straight and narrow path" to follow—and unlike modern scientific theories that offer all facts and no meaningful insight to apply to our daily lives—poetry draws organically on every possible perspective in all times and places, including spiritual experiences and physical experiences, then offers through their expression an evolving vision of life and how to live as humans. Poetry isn't a closed doctrine or a dry report, a conclusive revelation or a proven hypothesis. It is a living art form that engages sensuously if not almost sexually with each reader: every act of writing and reading poetry generates new experiences that "span vast realms of space and time, / Evolution—the cumulative—growths and generations." Thus no poet will ever write the definitive poem so much as participate in the ongoing human project, which is precisely what Whitman sets out to achieve in *Leaves of Grass*. This, at least, is his succinct "answer" to the ultimate existential questions in "O Me! O Life!":

O me! O life! of the questions of these recurring,
.....
Of the eyes that vainly crave the light, of the objects mean, of the struggle ever renew'd,
Of the poor results of all, of the plodding and sordid crowds I see around me,
Of the empty and useless years of the rest, with the rest me intertwined,
The question, O me! so sad, recurring—What good amid these,

O me, O life?

Answer.

That you are here—that life exists and identity,
That the powerful play goes on, and you may contribute a verse.

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