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Circulating Multitudes: From Antiquity to Cell Theory

Erratum

error in header corrected on 09/13/2018

CIRCULATING MULTITUDES: FROM ANTIQUITY TO CELL THEORY

STEFANIE HEINE



AS HAS OFTEN BEEN POINTED OUT in Whitman studies, the speaker of “Song of Myself” shares two essential traits with the collection the poem is part of: mutability and limitlessness. *Leaves of Grass* was published in six substantially different editions during Whitman’s lifetime and consists of over 400 poems, depending on the version considered. The question arises: what are we speaking of if we are speaking of *Leaves of Grass*? It is at once both one large poem and many different ones, a singularity and multiplicity. The tension emerging when a single entity has to be considered simultaneously as plural is voiced by the first-person speaker of “Song of Myself” concerning his own nature: two of the poem’s most well-known lines read “Do I contradict myself? / Very well then I contradict myself, (I am large, I contain multitudes.)”¹ The speaker asserts himself as a singularity, one specific instance uttering “I”—in four versions of *Leaves of Grass* (1856, 1860-61, 1867, 1871-72), the poem’s title even includes the name “Walt Whitman,” pointing to the author as an individual. At the same time, this speaker is determined by continual transformations: he does not only speak for, but literally becomes, other people of different professions and social positions, expands into infinite space and time, and fluidly merges with other spheres of the earth: in the epigraph for *Leaves of Grass*, the speaker assumes that he will “keep on” in lithosphere, biosphere, atmosphere, and hydrosphere, “tallying Earth’s soil, trees, winds, tumultuous waves” (LG1892 8). After having addressed a catalogue of various people, the speaker states: “And these tend inward to me, and I tend outward to them, / And such as it is to be of these more or less I am, / And of these one and all I weave the song of myself” (LG1892 41-42).

Considering these lines in more general terms, we can summarize that the speaker weaves his “Song of Myself” by becoming others, other, all. The speaker’s dissemination neither leaves the “I” dissolved

nor disembodied; rather, we encounter a transmutable, permeable body without fixed boundaries, breaching and questioning clear-cut categorizations and attributions. The radically democratic implications of *Leaves of Grass* are not least due to the interrelation between the “I” and a multitude of different species, objects or substances that are ascribed equal value. Thus, Whitman insists that human and non-human spheres are interdependent, involved in mutual exchange, and constantly intermingling. Whitman’s “I” is engaged in an on-going process of dispersion, rampant growth, proliferation, and circulation. It is staged as a ceaseless uttering power and a limitless life force that does not only bond with and speak through non-human organisms, but also through what is usually considered inorganic matter.

In this essay, I want to call attention to some intertexts and possible sources for these aspects that have long been recognized, and thus offer a new context for understanding them: the conceptions of the body and organic life depicted in “Song of Myself” can be traced back to antiquity, in particular to Pre-Socratic and Stoic philosophy, but at the same time go hand in hand with some of the latest discoveries in biology in Whitman’s time: “cell theory.” With regard to the tension between singularity and multiplicity in the organic poetics sketched in *Leaves of Grass*, tracking resonances of these two seemingly widely divergent discourses is revealing. Both early Western philosophy and cell theory negotiate individual bodies whose quality of being alive or animated disrupts their unity as singular beings; as *living* bodies, they disperse into assemblages of multiple entities. The focus on breathing, a concrete bodily process, in a central passage in the beginning of “Song of Myself” shall serve as a starting point to pursue what I roughly outlined in abstract terms.

The smoke of my own breath,
Echoes, ripples, buzz’d whispers, love-root, silk-thread, crotch and vine,
My respiration and inspiration, the beating of my heart, the passing of blood
and air through my lungs,
The sniff of green leaves and dry leaves, and of the shore and dark-color’d sea-
rocks, and of hay in the barn,
The sound of the belch’d words of my voice loos’d to the eddies of the wind (LG1892 30)

Cross-references between this passage and Whitman's celebration of empowered masculinity and idyllic, animating nature in his 1858 journalistic series *Manly Health and Training* are not far to seek: "Song of Myself" obviously praises the good fresh air granting a "feeling of health" (LG1892 30) that is so often mentioned as a basis for a wholesome life in *Manly Health and Training*. The encouragement "to raise the voice in some cheerful song—to feel a pleasure in going forth into the open air, and in breathing it—" almost sounds like the prose version of the respiration-passage in "Song of Myself." However, Whitman's lyrical presentation of breath is far more complex than the rather straightforward arguments in *Manly Health and Training*: it unsettles the gender-ideological implications and offers a reflection of life forces reaching far beyond a promotion of the vitalizing power of unspoiled nature.

The specification of "my own breath" as "respiration and inspiration" invokes discourses around life forces rooted in the domains of ancient philosophy and contemporary biology. "Respiration" designates what Whitman describes in minute anatomical detail: the physiological "action of taking air into the lungs . . . and expelling it again" (as the *OED* describes it). Moreover, by the time Whitman wrote "Song of Myself," the term "respiration" was already used in a biochemical context, referring to the gas exchange performed by both human and non-human organisms. The *OED* gives an example from the field of botany, quoted from the *Journal of the Royal Institution of Great Britain* in 1831: "this function, which is performed chiefly by the leaves and petals, . . . is attended with . . . the conversion of oxygen into carbonic acid; it is the respiration of plants." Another example from a text that was published only a year after the first version of "Song of Myself," Karl Gotthelf Lehmann's and James Cheston Morris's 1856 *Manual of Chemical Physiology*, confirms the use of the word "respiration" for chemical gas exchanges in animals' bodies by questioning its accuracy: "This exchange of oxygen and carbonic acid, which we improperly call respiration, is not confined to any single spot of the organism."³ These two examples provided by the *OED* show that in the mid-nineteenth century, "respiration" indicated a process that shares qualities with the speaker of "Song of Myself": it links vegetable and

animal bodies, involves transformations, and is “not confined to” one specific location. As a process that involves a continuous exchange between living organisms and their environment, respiration can be considered a distinctive physiological activity of Whitman’s speaker. Whitman’s “I” is what Marcel Duchamp many years later chooses as his self-definition as an artist: a breather.⁴ The contemporary uses of “respiration” in the context of biology thus entail some essential poetic concerns of “Song of Myself.”

So does “inspiration,” pointing back to antiquity. In its Latin meaning, inspiration also refers to physical breath, that is, to the act of inhaling. In addition, the term is heavily invested with ancient thought beyond a biological context: the Latin *inspiratio* implies a life-giving spirit pervading the body. When Whitman equals “respiration” and “inspiration,” he challenges an opposition between physical and spiritual life that was firmly established in the mid-nineteenth century. Thereby, he treads similar paths as Joseph Priestly, whose work Whitman was familiar with, as we know from a note written 1857.⁵ Pursuing a career as scientist, philosopher and theologian, Priestly investigated breath both in the chemical and philosophical sense: he published essential findings about the relations of respiration and blood in 1776 and scrutinizes the biblical image of the breath of life as well as conceptions of the soul that are linked to breath in his materialist treatise *Disquisitions Relating to Matter and Spirit* (1777), where he argues that man is “not split into spirit and body.”⁶ Priestly draws on the semantic shift towards the incorporeal that the network of terms around “spirit” underwent in the Christian tradition⁷ when he describes how “the moderns . . . refined upon the former notion of spirit, excluding from it every property which it held in common with matter” (223). As Priestly notices, and it is well possible that Whitman was influenced by this observation, the increasing body-mind/spirit dichotomy did not exist in antiquity with regard to conceptions of the soul: “what the ancients meant by immaterial being, was only a *finer kind* of what we should now call *matter*; something like *air* or *breath*, which first supplied the name for the *soul*” (222). Priestly here refers to the word πνεῦμα (*pneuma*), which means physical breath and spirit at the same time.⁸ It is plausible to assume that in his refer-

ences to breath, Whitman recalls conceptions of *pneuma* as a material substance in Pre-Socratic and Stoic philosophy as well as Ancient Greek medicine, a line of thought that did not maintain a dualism of body/matter and mind/soul. When looking for a direct influence of Whitman's negotiations of breath in his poetry, it at first sight seems obvious to consider Emerson's reflections of "spirit," an expression of the "universal soul"⁹ that "conspire[s]" with nature (63) and "hath life in itself" (35). Even though, for Emerson, this spirit "manifest[s] itself in material forms" (43-44), the spiritual "foundations of man are not in matter" (87). Along with the Christian connotations of the concept, Emerson's spirit is immaterial. Similarly, the Romantic notion of a natural spirit, which is often addressed in terms of wind and breath, is highly invested with such Christian implications. It has been observed that Whitman's "strain of meaty materialism" is what "distinguishes his work from that of Wordsworth and Emerson."¹⁰ Whitman's negotiations of life forces in "Song of Myself" highlight the corporeal and material, and he famously resists a dualistic relation between body and soul, for example in his epigraph to *Leaves of Grass*: "Come, said my Soul, / Such verses of my Body let us write, (for we are one)" (LG1892 1).

By the end of his life, Whitman possessed a "broad, general knowledge of classical . . . literature";¹¹ even though one cannot trace a systematic adaption of a particular thinker or school in "Song of Myself," the poem clearly takes up ideas from antiquity. Especially the notion of *pneuma* in Stoicism and Pre-Socratic philosophy offers a promising point of reference for an investigation of life forces and breath in the corporeal and material sense they are negotiated in "Song of Myself." By mentioning the "*smoke* of my own breath" (my emphasis), Whitman does not only allude to the Germanic origins of the English word breath, indicating an "exhalation from heat" or "steam."¹² The smoke of the breath also recalls ancient, especially Stoic conceptions of *pneuma* as a fiery element or vital heat connected to and sometimes identified with breath—again, Priestly, who discusses notions of the soul as "*vital fire*,"¹³ may have been a direct influence on Whitman in this respect.¹⁴ *Pneuma* has continually been thought along with one of Whitman's most prominently invoked addressees,

the soul, ever since Anaximenes's famous equation "Just as our soul [*ψυχή*], . . . which is air [*ἀήρ*], holds us together, so wind/breath [*πνεῦμα*] and air [*ἀήρ*] surround the whole cosmos."¹⁵ The Stoic idea of a material soul consisting of fiery *pneuma*, evoked in "the smoke of my own breath," ties in with Whitman's insistence on a physical soul to which the body is not inferior. The identity of soul and body Whitman postulates turns out to be crucial for the physical transformations the speaker undergoes throughout the poem.

Whitman's assumption that the soul *is* body, or is part of the body, read along with the close link between breath, especially hot breath, and soul in antiquity, gives the breath-passage in "Song of Myself" a new twist: "the smoke of my own breath" can be read as fiery *pneuma* leaving the body—as that part of the body which is considered the soul leaving the body—or, in other words, as the body extending itself beyond its boundaries when a part of it—"the smoke of my own breath"—goes adrift. What streams out fuses with an array of seemingly heterogeneous elements and phenomena of the external world, "Echoes, ripples, buzz'd whispers, love-root, silk-thread, crotch and vine." The initially somewhat obscure line anticipates later passages of the poem in which it becomes obvious that the speaker himself diffuses into outside objects, organisms, and substances. Towards the end of "Song of Myself," the speaker scatters into air and physically merges with the surroundings:

I depart as air, I shake my white locks at the runaway sun,
I effuse my flesh in eddies, and drift in lacy jags.

I bequeath myself to the dirt to grow from the grass I love,
If you want me again look for me under your boot-soles. (LG1892 78)

In these lines, which recall the passage on breath, the speaker merges with the exhaled air; it is now the "smoke of my own breath" itself that speaks. It is crucial to mention that air is designated as one of the substances the speaker's body is created of in the beginning of the poem: "My tongue, every atom of my blood, form'd from this soil, this *air*" (my emphasis) (LG1892 41-29). Thus, the body that is said to be made of and emerge from air and soil in the first part of "Song

of Myself” literally diffuses back into these substances in its last part.¹⁶ Mysteriously, that which leaves the speaker’s body with the exhaled air, the very air that gave life to it, seems to remain part of the body and part of the “I” that keeps speaking as air, when its flesh fuses with the wind and it becomes soil and grass. The material continuity of air is a central factor for the “I’s” insistence throughout the transformations it undergoes. Air functions analogous to the ancient notion of *pneuma*: according to various Stoic sources, *pneuma* was assumed to exist in the body as an animating force. However, it is also described as a transmutable vital substance outside the human body that holds the world together, has part in everything and permeates all: “Just as this *pneuma* [the ‘substance that permeates a living thing and makes it alive’] makes a man a living, organic whole, so the cosmic *pneuma* makes the cosmos a living, organic whole, with each single part grown together.”¹⁷ The idea that the human body/soul and the outside world are physically and materially connected through a life-(giving) force, an airy substance that has the capacity to enter and be emitted from the body, resonates in Whitman’s fluid speaker that extends to the cosmos, which is made most explicit in the following passages: “Walt Whitman, a kosmos,” “Partaker of influx and efflux I,” “Through me the afflatus surging and surging” (LG1892 46-48).

In “Song of Myself,” substances from outside constitute the speaker, and what he emits to the outside retains his identity. The elements in motion and their transformations are often described as being involved in processes of *circulation*—and here we enter the field of biology. The passage on breath in “Song of Myself” displays cyclical movements of different substances: the breath leaves the body and extends into a multitude of elements of the natural world (“The smoke of my own breath, / Echoes, ripples, buzz’d whispers, love-root, silk-thread, crotch and vine”). Subsequently, the focus is inside the body, on the organs and the processes taking place there (“My respiration and inspiration, the beating of my heart, the passing of blood and air through my lungs”). The next line is devoted to inhaling; the smells that enter the nose and the objects emanating the smells are addressed (“The sniff of green leaves and dry leaves, and of the shore and dark-color’d sea-rocks, and of hay in the barn”). Finally, the sound

of the voice carried by exhaled air passing over into the wind is described (“The sound of the belch’d words of my voice loos’d to the eddies of the wind”). What is depicted in this passage clearly draws on interrelated physiological processes: the pulmonary cycle and bloodstream as well as respiration. The respirational process is itself determined by a circulation of air entering and leaving the body, including gas exchanges, transmissions and transformations of chemical substances. The movement of the processes within the body, palpably put into words in “the beating of my heart, the passing of blood and air through my lungs,” is extended to the passage, if not the poem as a whole. One could argue that the vital exchanges and organic confluences taking place in “Song of Myself” are modeled on the physiological act of breathing. The organic process of respiration—in fact the very process that keeps the organism alive—relies on the participation of a non-organic substance, air. Adapting and stretching the biological assumptions he draws on, Whitman presents an open body that lives because it is enmeshed in cyclical dissemination processes involving substances and elements that are outside and other than itself. A life force is maintained because the parts of the speaker that detach, but still contain the “I,” fuse with elements of the outer world and other beings. The already quoted passage at the end of the poem takes this to extremes: “I depart as air . . . [,] I effuse my flesh in eddies . . . [,] I . . . grow from the grass.” Such a conception of life differs substantially from the vitalism common in Whitman’s time, which holds “that living organisms are fundamentally different from non-living entities because they contain some non-physical element or are governed by different principles than are inanimate things.”¹⁸ In stark contrast, the animating process Whitman depicts implicates an interdependence and intermingling of inorganic and organic substances and entities.

The line “My tongue, every atom of my blood, form’d from this soil, this air” suggests that the parts floating between the speaker and the outside world or its inhabitants are small: atoms, particles. The poem’s third line reads “every atom belonging to me as good belongs to you” (LG1892 29). “You,” which is not specified at this point, later invokes a multitude of addressees: the soul, the reader, various humans from all social levels, a long list of the speaker’s own body parts and

fluids, organs, vapors, brooks, dews, winds, fields, the sea, oxen, a leave of grass, etc., etc. The unspecified “you” in the very beginning of the poem anticipates them all—every atom of the “I” also belongs to the “you”: smallest particles are shared and can be exchanged. Whitman’s transferrable atoms relate back to antiquity by recalling Democritus’s assumption that everything consists of atoms in motion: “the atoms are unlimited in size and number, and they are borne along the whole universe in a vortex, and thereby generate all composite things.”¹⁹ In “Song of Myself,” the Pre-Socratic notion of an all-pervading airy and fiery *pneuma* meets the atomists’ idea of “soul atoms,” which induce and maintain a being’s life, exist outside and enter and leave the body in the breathing process: “[I]f is attributable to the presence of these swiftly moving atoms The dispersion of the ‘soul’ atoms brings death, [... which] is prevented by breathing in the surrounding air . . . likewise composed of the mobile atoms.”²⁰ Despite their different material consistency, *pneuma* as an extensive fluid substance, and the soul atoms as smallest particles, are both life-giving and pervade the bodies they animate.

In a footnote to “creation’s incessant unrest” mentioned in “The Great Unrest of which We Are Part” (*Specimen Days*),²¹ Whitman situates the idea of particles in motion in the context of contemporary science:

Every molecule of matter in the whole universe is swinging to and fro; every particle of ether which fills space is in jelly-like vibration. Light is one kind of motion, heat another, electricity another, magnetism another, sound another. . . . The processes of growth, of existence, of decay, whether in worlds, or in the minutest organisms, are but motion.²²

The citation, for which Whitman does not give a source, is taken from the Methodist *City-Road Magazine*, published in 1876. The passage occurs in a section titled “Notes on the Science of the Month” by Rev. W.H. Dallinger, who presents new scientific findings of the British chemist and physicist William Crookes. The article focuses on Crookes’s discovery of the “motive power of light”²³, which “is only one more proof to the many which modern investigation has supplied of the constant and intense molecular and atomic activity of matter”

(178-188). In such “investigations,” made possible by the “modern microscope” (189), the speculation that the world consists of moving atoms in antiquity is empirically substantiated. In the very same magazine issue—an issue that Whitman obviously studied—another entry by Rev. W.H. Dallinger about latest scientific findings is dedicated to the tiny particles of living organisms: Dallinger mentions the “minute forms of life . . . revealed to us by the microscope” (138). In the discussion of how new “discoveries in Biological Science” reveal a “*continuity* of the animal and vegetable series of organic forms” and thus blur the “sharp line of division between them” (138), Dallinger refers to the core findings of a branch of biology that just came up in the time Whitman wrote *Leaves of Grass*, then referred to as “cell theory”: “Schwann and Schleiden have shown that the fundamental basis of both animal and vegetable life is the same—a cell” (138).

The magazine was published after the first version of *Leaves of Grass* was written and it cannot be proved for certain that Whitman read the article referring to cell theory, but it is at least likely because he quoted from another text in the same issue. In Whitman’s time, cell theory was rigorously discussed in the English-speaking world. The pioneers of cell theory came from Germany, but their work was soon translated into English. Matthias Jakob Schleiden’s article “Contributions to Our Knowledge of Phytogenesis” (1838), arguing that plants consist of “*peculiar small organism[s]*,” “cells,”²⁴ was published in English in 1841. The English translation of Theodor Schwann’s foundational essay *Microscopical Researches into the Accordance in the Structure and Growth of Animals and Plants* (1839), extending Schleiden’s findings to animal organisms, was published in 1847. The third major study in cell theory, Rudolf Virchow’s *Cellular Pathology* (1858) was translated in 1860. Virchow investigated the importance of cell theory in medicine and presented a finding essential to the notion of cell division: “Where a cell arises, there a cell must have previously existed (*omnis cellula e cellula*).”²⁵ The temporal coincidence of the translation of Virchow’s work with the third edition of *Leaves of Grass* and the fact that cell theory emerged while Whitman started working on *Leaves of Grass* is telling. Even though no direct references to cell theory, its foundational texts and their authors,²⁶ have yet been

discovered in Whitman's work, it is improbable that this new branch of biology escaped Whitman, who, as many studies have shown,²⁷ had a genuine interest in the science of his time. That Whitman knew about cells as minute particles of the body is shown in a chapter of *Specimen Days*, "Plays and Operas Too," when he remembers having felt Fanny Kemble's acting "in every minute cell."²⁸ Whitman explicitly stresses the indebtedness of his poetic endeavors to science in two of the prefaces of *Leaves of Grass*: scientists are considered "as lawgivers of poets" whose "construction underlies the structure of every perfect poem"²⁹ in the 1855 preface, and in the preface to the two-volume Centennial Edition of *Leaves of Grass* and "Two Rivulets," Whitman writes: "Without being a Scientist, I have thoroughly adopted the conclusions of the great Savans and Experimentalists of our time . . . and they have interiorly tinged the chyle of all my verse."³⁰ In the following, I want to show how cell theory "tinges the chyle" and "structure" of "Song of Myself," how it correlates with the poetic questions posed in the text as well as with the constitution of its speaker, and how the terminology of cell theory resonates in the poem with respect to the life forces invoked.

Already Dallinger's short summary of cell theory in the magazine Whitman quoted from shows in how far the new branch of biology tackles the central issues negotiated in "Song of Myself." Dallinger's text ties in with Whitman's passage on breath, as he extensively addresses the respiration of plants and animals while discussing the similarity or difference between animals and plants. The new insights of cell theory, that the boundary between "the animal and vegetable series of organic forms" is fluid, goes hand in hand with the picture presented in "Song of Myself." As Dallinger recounts Schwann's and Schleiden's research, it is the cell, "the fundamental basis of both animal and vegetable *life*" (my emphasis), that accounts for such a continuity between plants, humans and animals. In terms of cell theory, Whitman's claim that every "atom" of the "I" also belongs to "you" could be reformulated as "every cell belonging to humans as good belongs to plants." In turn, Schwann's claim that "the elementary particles of animals and plants must be shown to be products of the same formative powers, because the phenomena attending their

development are similar; that all elementary particles of animals and plants are formed on a common principle"³¹ could be summarized with the line "every atom belonging to me as good belongs to you."

In "Song of Myself," the atoms of the blood occur in the context of birth, the emergence of the speaker and its lifespan: "My tongue, every atom of my blood, form'd from this soil, this air / Born here . . . I . . . begin, / Hoping to cease not until death" (LG1892 29). Here, another life-sustaining fluid of the body besides air enters the poem. Whereas in "Song of Myself," the classical discourse of live-giving breath, air, soul and *pneuma* is linked to physiological respiration, the idea of life being maintained in smallest particles in the context of cell theory can be pinpointed most specifically by considering blood. It is worth noting that the connections of respiration and blood were scientifically proved for the first time by Whitman's possible inspiration Joseph Priestly. Whitman's atoms of the blood resonate with the terminology of cell theory. In the English translation of Theodor Schwann's *Microscopical Researches*, what from 1900 on was increasingly called "blood cells" was termed "blood corpuscles." The "cellular nature of the blood-corpuscle" was already confirmed by Schwann: the blood-corpuscle "is a flattened cell furnished with a cell-nucleus, which is fixed to a spot on the internal surface of the cell-membrane."³² Drawing from sources between 1660 and 1812, the *OED* defines a corpuscle as a "minute body or particle of matter. Sometimes identified with *atom* or with *molecule*."³³ Terms like "corpuscularism" or "corpuscular theory of light"³⁴ show the prominence of the term designating the smallest particles matter consists of, but "atom" and "molecule" were equally used in the scientific contexts across different fields from the seventeenth century on. While "cell" became the prominent term to refer to smallest vital particles of living organisms, the proximity of "cells," "blood corpuscles" and "atoms of the blood" is apparent. Molecules and atoms are used as terms for minute particles of any kind of animate or inanimate matter; in "Song of Myself," where the focus is on the blood of a living organism, it would have been more scientifically accurate to talk of corpuscles or cells in a nineteenth-century context. One could see Whitman's conflation of terms regarding smallest particles, and his indistinct use of them, as symptomatic for

his pseudo-scientific approach and his lack of profound knowledge about the scientific discourses he implements in his poetry. However, it is also possible to read it as the articulation of an ethics in line with Whitman's democratic demands in "Song of Myself." Whitman's claim for equality exceeds that of animals and plants, including the inanimate and inorganic. Living beings and inanimate matter share atoms; they do not only connect plants and animals, like the cells. What Whitman seems to take from the insights of cell theory, and transfers to atoms, is that minute particles can be small forms of life.

A pivotal passage of Schwann's *Microscopical Researches* stresses a vitality of individual cells that is enabled by the mobility of smallest particles (molecules):

we must ascribe to all cells an independent vitality, that is, such combinations of molecules as occur in every single cell, are capable of setting free the power by which it is enabled to take up fresh molecules. The cause of nutrition and growth resides not in the organism as a whole, but in the separate elementary parts—the cells.³⁵

The conception of smallest units of life, "separate elementary parts" capable of growth and "independent vitality" resonates in Whitman's "I," which keeps on speaking and living when severed from the organism it originally belongs to and detaches from a human body, to disseminate and merge into other elements. "Song of Myself" displays principles of sustaining life by division and fusion. In the passage where the "I" claims to "depart as air," "effuse" its "flesh in eddies" and "bequeath" itself "to the dirt to grow from the grass," the speaker's principle of growth structurally resembles what Virchow describes as "the mode of growth, not only in vegetables, but also in the physiological and pathological formations of the animal body":

This growth is effected thus: a division takes place in some of the cells, and a transverse septum is formed; the newly-formed parts continue to grow as independent elements Every protuberance is therefore originally a single cell, which, by continual subdivision . . . pushes its divisions forwards, and then, when occasion offers, spreads out³⁶

When Whitman's "I" "departs as air" and "effuses its flesh in eddies,"

it divides itself, and the “newly-formed parts continue to grow as independent elements”: “I,” the newly formed part, “bequeath myself to the dirt to grow from the grass.” The cellular growth Virchow describes takes place within a specific organism; in Whitman’s scene, the model of growth sketched by Virchow is extended to a growth across singular organisms and entities. What a present-day handbook of cell biology states about the processes in which cells are involved in living organisms applies to the speaker of Whitman’s poem: “Cells are sites of bustling activity. Materials are transported from place to place, structures are assembled and then rapidly disassembled, and, in many cases, the entire cell moves itself from one site to another.”³⁷ Analogous to cells, Whitman’s speaker has the capacity of transforming himself and his body, and that body is connected to the outside like a cell’s permeable membrane. The speaker of “Song of Myself” has cell-like traits, and is at the same time sketched as an organism containing multitudes of detachable cells.

In this analogy, the “I” can be compared to cells that separate from the organism they belong to—an ability that some organisms, notably not human ones, have. This leads to a further crucial trait of the speaker: the “I” exceeds a human’s lifetime. That the “I” assumes to be there after “five thousand” (*LG1892* 69), “ten thousand or ten million years” (*LG1892* 45) can be read as a reference to evolution when one focuses on the level of species. Zooming in on a single living being and taking into account findings that exceed Whitman’s lifetime, findings that almost seem to be anticipated in his writing, cell biology offers an equally plausible reading. Cells have the capacity to generate new life, to pass on their genetic information to future generations and to live on after the organism they were part of died. To speak with Whitman: “The smallest sprout shows there is really no death, / And if ever there was it led forward life . . . / All goes onward and outward, nothing collapses” (*LG1892* 34). Paradoxically, however, the speaker’s claim “I know I am deathless” (*LG1892* 44) also implies death. “And as to you Life I reckon you are the leavings of many deaths, / (No doubt I have died myself ten thousand times before.)” (*LG1892* 77). From the perspective of cell biology, this does not represent an inconsistency: cell-turnover implicates that cells in

a living organism constantly die and are renewed. Of the multitudes of cells contained in a living organism some die while the organism is alive and some keep on living after it dies. If we stick to the perspective of cell biology, the picture ensuing is plausible: what makes Whitman's speaker last for millions of years is not granted by a notion of eternity, but by continual replacement and transposition of the smallest living particles it consists of.

This brings us back to the contradiction addressed in the beginning of the article: given these circumstances, how can the speaker continue speaking as an "I," as a singularity? Schleiden addresses the question of individuality in "Contributions to Our Knowledge of Psychogenesis":

At most we can speak of an individual in its true sense only in some of the lowest orders of plants, in some Algæ and Fungi, which consist only of a single cell. But every plant developed to a somewhat higher degree, is an aggregate of fully individualized independent beings, even the very cells. Each cell leads a double life: an entirely independent one, belonging to its own development alone; and an incidental one, in so far as it has become the constituent and part of a plant.³⁸

According to Schleiden, a living organism is a *dividuum* consisting of multiple independent living individuals: the cells.³⁹ Schleiden's most striking argument is that cells themselves "lead a double life": they are both independent individuals and part of a larger living entity. That the living organism is an assemblage of small independent individuals does not put its existence as a specific being in question for Schleiden: the organism, in Schleiden's case the plant, also leads a double life: it is *one* organism, the "whole" that the individual cells are part of, and an "aggregate of fully independent beings." Such a conception makes Whitman's speaker plausible: "I am large": I am one organism, "I contain multitudes," I am an aggregate consisting of individual parts. In "Song of Myself," the "I" seems to be able to speak from the perspective of the organism as a whole, and from the perspective of the cell (both attached to the organism and detached from it): it leads a fourfold life.

This does not offer a "resolution" of the contradiction inherent

in the claim “I am large, I contain multitudes.” It is still a mystery how a multitude can be considered as a singularity at the same time. Here I want to take a comparative look at how the two influential discourses discussed in this article, Pre-Socratic and Stoic philosophy and cell theory, approach the “contradiction” addressed in “Song of Myself.” At first sight, ancient notions of *pneuma* or the soul and cell biology appear to be as opposed as it can get: on the one hand, we have the assumption of *one* overarching and in itself lasting live-giving substance, or *one* soul that has a share in this substance; on the other, we have a *multitude* of smallest units of life that are subject to decay. However, there are more similarities between the two discourses than one would expect. Both conceptions of life are centered on materials, a fluid substance on the one side, smallest organic particles on the other, and both imply that parts of a being may de-part from it, only to go on living or engender new life. Strictly speaking, the notion of a unitary subject or organism has to be dismissed in both discourses. In antiquity, living beings are constituted and animated by a substance entering from without that is other and external to them, and in cell theory, the living organism consists of a vast number of smaller living organisms.

“Song of Myself” seems to extend these assumptions with respect to what the speaker is capable of: the “I” can expand to an overarching fluid substance—it is large—or it can scatter into smallest particles—it contains multitudes. How the severed or diffused parts keep being the same as the organism they departed from remains unclear in both discourses Whitman appears to be drawing from. Tracing their juxtaposition in “Song of Myself,” however, enables a more concrete localization of the historical, philosophical, and scientific threads that inform the contradiction at the heart of the poem. That the complexity resulting from their superimpositions and interferences adds open questions rather than answering them is by no means a deficiency. The intertwining discourses contribute to the poem’s proliferations, its twigs and paths branching out into various directions that may cross, but do not coalesce into closure. Concerning the cells, it has already been discussed how the continual replacement of the smallest vital particles accounts for an organism’s persistence in time; its life is

based on the continual de- and re-composition of cells. At first sight, the notion of life-giving and life-sustaining *pneuma* does not seem to provoke the question of how a being's identity is upheld with respect to what keeps it alive, as *pneuma* is conceived of as one pervading substance. However, one has to keep in mind that this substance is fluid and in constant motion. The question how a *pneuma*-perfused being can be *one* being is as paradoxical as Heraclitus's river containing ever-new waters.

The central contradiction implied in the on-growing, expanding, plural "I" also pervades the poem's poetological dimension. Literature seems to be the place *par excellence* where such ambiguities can be articulated, as language itself contains multitudes and is determined by circulation. Whitman considered language as a living organism. This is especially highlighted in some parts of William Swinton's *Rambles Among Words* that are attributed to Whitman.⁴⁰ The chapter in question is titled "The Growth of Words"; it is noteworthy that already in the beginning of the book, it is stated that the "growth of language repeats the growth of the plant,"⁴¹ which further substantiates a parallel between Whitman's writing and the findings of cell theory. The chapter "The Growth of Words" opens with a quote from Humboldt: "One must not consider a language as a product dead and formed but once: it is an animate being and ever creative" (265). Further, it is argued that "Each language is a living organism; . . . Language throbs with the pulses of our life" (265). It displays characteristics "of every living organism," for example "in the exhibition of growth, progress, decay" (266). Such a conception of language as a living body makes it obvious that, in "Song of Myself," the emphasis on life and life-giving forces also concerns the life of the poem as a literary text. By mentioning its "inspiration" and "respiration," the speaker points to the life-giving impulses for the poem. As its contemporary use as an umbrella term for creative ideas suggests, inspiration is particularly associated with the creation of artworks. Numerous accounts of inspiration, especially in antiquity, hold that artistic works are initiated by a rush of breath from an external source.⁴² Whitman modifies this model by equating inspiration and respiration. Inspiration, a one time live-giving act turns into respiration, the physical process a living organism continually

has to partake in order to sustain life. In “Song of Myself,” on-going inspiration as an act of breathing is connected to the act of speaking (the poem).

The respiratory imagery in “Song of Myself” is certainly linked to the fact that the poem embraces orality and the spoken word, which requires breath as a medium. The title of the poem already highlights such a focus on oral articulation and the “I” claims to “sing” (LG1892 29) rather than to write itself. Whitman thereby evokes the earliest chapters in the history of literature, when the ancient bards sang poetry. There is a debate about the degree and development of oral characteristics in Whitman’s poems, including *Leaves of Grass*,⁴³ but their musicality is unquestionable. The specific arrangement of Whitman’s long lines in *Leaves of Grass* was expansively discussed in terms of orality and breath in the later reception of his work, especially in the context of the Beat Generation that celebrated Whitman as the father of free verse and the inaugurator of an American poetry liberated from British literary tradition. Especially Allen Ginsberg repeatedly refers to Whitman as a model for his respirational technique of composition: “I write poetry because Walt Whitman opened up poetry’s verse-line for unobstructed breath.”⁴⁴ Ginsberg claims to end the lines of his poems when he runs out of breath: “Ideally each line of Howl is a single breath unit. . . . My breath is long—that’s the measure, one physical-mental inspiration of thought contained in the elastic of a breath.”⁴⁵ Although we do not know whether Whitman also used such a compositional method, his “life-long interest in oratory” and the fact that he gave a few public lectures⁴⁶ suggest that he was aware of oral structuring of language when he wrote his poems and probably knew about the relevance of breath for recitation.

Against this background, I want to turn back to the passage on breath in “Song of Myself.” What is exhaled by the speaker is “The *sound of the belch’d words of my voice* loos’d to the eddies of the wind” (my emphasis). Here, the anatomical fact that breathing is necessary for speaking and that articulated sounds are carried by exhaled air meets a linkage of two etymological traces of the word “breath.” That the words are “belch’d” points to the “smoke of the breath” emitted, and thus to the etymological connection of breath and soul.

Moreover, the words' dissolution into wind via breath recalls one of the meanings *pneuma* used to have: wind. The words disseminate into air and merge with the "eddies," the circular movement of wind. This is a description of what is performatively shown before. The emitted "smoke of my own breath" turns into a circulatory extension of language in the line "Echoes, ripples, buzz'd whispers, love-root, silk-thread, crotch and vine." The echo is a sound wave reflected back and transmitted by air. Its movement is continued in "ripples," circular wave expansions in water spreading outwards, and "buzz'd whispers," which again point to a transmission of sound as well as to the whirring movement of a circulating current. Love-root, the name of a plant with ramifying leaves and umbels of flowers moves the notion of circular spreading to the level of organic nature, referring back to "ripple" in its meaning of "woodland" and "thicket." Silk-thread also designates a natural product; the woven silk-cocoon can be read as a self-reflexive gesture alluding to the textual interweaving we are faced with in the very moment we read the line. The twine on which silk-threads are coiled for textile use then again displays a circular form. Concerning a tree, river or street, "crotch" designates a bifurcation, which relates us back to the diverging growth of the "love root," spreading outwards in different directions. Also its meaning with regard to human anatomy, genitals, opens a connection between "crotch" and "love root"—thereby stretching the meaning of "love root" in an erotic, sexual direction. Finally, the "vine," a trailing, climbing plant, brings us back to the botanical domain of "love root"—although the implications of growth and spreading are also in line with the connotations of erotic encounters and sexual reproduction.

The vital streams described also mirror the movement between the words placed next to each other in a flowing free-verse line—the circulation of their meaning as well as the quality of their sounds: smoke, echoes, ripples, buzz'd whispers, love-root, silk-thread, crotch, vine. Each of the words contains a fricative, that is, a consonant produced by air being forced through a narrow channel between the articulators. There is a special emphasis on sibilants in which the airflow is audible as a hissing sound. If we, the readers, pronounce the passage,

we become participate in the circulation, and thus potentially encounter the speaker who concludes the poem by saying “I stop somewhere waiting for you” (LG1892 78). Moreover, when reading the poem out loud, we take the “I” in our mouth and emit it into the outer world again with the air carrying the uttered letter. The language-cell “I” splits into new life once we take it in and up. This is anticipated and pushed further by the speaker in the end of the poem, when it figures itself not only as expanding into other elements within the text via air, but thereby also extending the pages of the book, sprouting into the reader’s body, acting as a vital force in her blood cycle:

I depart as air . . .
I effuse my flesh in eddies . . .

You will hardly know who I am or what I mean,
But I shall be good health to you nevertheless,
And filter and fibre your blood. (LG1892 78)

When Whitman writes that the speaker has the capacity to filter the blood, it is probable that he alludes to quack medicine like Benjamin Brandreth’s pills that were said to cure impurities of the blood and were promoted extensively in the 1830s and 40s. An article in *The New York Herald* in 1849 states the following:

These celebrated Pills . . . have in their composition a vegetable corpuscle, analogous to the corpuscle of the blood; this corpuscle, of vegetable origin, becomes incorporated with a mass of the circulating life-giving fluid, and IMPARTS A FERMENTATIVE POWER which occasions the blood to throw out all infective, poisonous, or peccant matters, thereby entirely purifying the whole volume of blood in the circulation.⁴⁷

What the article describes and the language it uses to do so, shows how closely Whitman’s idea of small vital particles of the blood is related to cell theory (the research conducted in the field of botany, the notion of “corpuscles,” etc.). In “Song of Myself,” the speaker embodies (at least) two forms of life that coincide with the central idea of the “individual” in cell theory: it is an organism containing particles, “atoms of the blood,” and it is a particle—a vegetable

corpuscle analogous to the corpuscle of the blood, maybe—that filters the blood. In Whitman’s outline, the “atoms of the blood” are transferrable from one organism to another. Whitman’s allusions to blood circulation are closely related to physiological characterizations of the breathing process: respiration is determined by “ventilation, diffusion [and] circulation.”⁴⁸ “Song of Myself” anticipates what has only been scientifically verified later, namely the interconnection between external respiration, inhaling oxygen and exhaling carbon dioxide, and internal or cellular respiration, which involves the transportation of oxygen by the blood cells as well as the production of energy vital to the organism through the gas exchange. In “Song of Myself,” the respirational process of a single organism, which as such interconnects inside and outside, is extended to relations between entities, between addresser and addressee, speaker, poem and readers.

The rare use of “fibre” as a verb Whitman employs in “Song of Myself” refers to a plant’s forming or throwing out fibers.⁴⁹ The speaker thus for a moment coincides with the title of the collection of poems, the leaves of grass, when the “I” morphs into a plantlike organism, spreading through sound particles, merging with the human organism who might encounter the poem and read it out loud. Following the biological connotations of the verb Whitman weaves into the final line of his sprouting poem, I want to conclude my essay with an exploration of some intriguing intertextual fibers connecting “Song of Myself” and Schwann’s *Microscopical Researches*. The second class of cells Schwann discusses in his book is called “[i]ndependent cells united into continuous tissues” (66). This characterization alone marks these kinds of cells as the most appropriate point of comparison to the processes sketched in “Song of Myself,” especially the “I’s” unification with other beings and things, its transformation from an individual to an assemblage. It is also worth noticing that according to Schwann, “[t]his class presents us with the greatest similarity between animal and vegetable structure, and indeed, in so high a degree, that even an experienced botanist cannot distinguish some of the objects which belong to it from vegetable tissue” (73). The independent cells uniting into continuous tissue are the domain where the boundary between animals and plants becomes porous in Schwann’s research, which

resonates well with the space of fluid transitions between different species, organic and inorganic matter presented in “Song of Myself.” In Schwann’s claim that “[t]he cells of these tissues generally remain independent, but more or less intimate blendings of the cell-walls with one another also occur in this class” (73), Whitman’s central concerns resound: the “blendings” of an independent entity, a singularity, with others.

In Schwann’s book, “these tissues” refer to “horny” ones such as hoofs and feathers as well as to “the crystalline lens” (73). It is at this point where reading Schwann’s and Whitman’s texts together opens up a most compelling poetological scene. Read hand in hand with “Song of Myself,” the examples Schwann uses to characterize “independent cells united into continuous tissue,” feathers and the crystalline lens, invite us to make a connection: between the tool with which Whitman wrote “Song of Myself,” a quill, and the “I”/eye that speaks and observes in the poem. When Schwann mentions that class-two cells elongate into “long cylinders (called *fibres*)” (92; my emphasis), the movement of growth and extension described does not only meet what Whitman ascribes to his “I”/eye through his quill in analogy, but in a particular word. Moreover, Schwann stresses the similarity between the extension of cells in the crystalline lens and the cellular constitution of grasses—the eponymous vegetable organism of Whitman’s collection of poems: “in this flat and serrated condition, the cells of the crystalline lens perfectly resemble those of the epidermis of some grasses” (92)—“I . . . grow from the grass” (LG1892 78). Schwann outlines two opposite processes of how cells form continuous tissue; one is typical for pigment cells, but possibly also for the crystalline lens, the other for feathers:

Probably, the prolongations of two cell-cavities join a certain point, the cell-walls unite together there, and the partition-wall becomes absorbed, and thus an uninterrupted passage from one cell-cavity into another is produced. I am not certain as to whether a similar process does not take place in some fibres of the crystalline lens. A completely opposite process occurs in the cortical substance of the shaft of feathers, viz. a division of the cells into fibres. By this process, out of a single cell fibres are generated, which, in the first instance, are united together by the rest of the substance of the cell, but at a later period of development may be insulated to a considerable extent. An elongation of the cells into

these fibres takes place, indeed, at the same time, but the major portion of each fibre is formed by the division of the bodies of the cells. (92-93)

The movements of division and fusion described here by reference to the crystalline lens and feathers respectively go hand in hand with the ones described in “Song of Myself”: the extension of the speaker merging with a connecting *pneuma*-like substance and the “I’s” “division into fibres,” its atomization and diffusion into particles that continuously uncouple and couple. What “Song of Myself” describes with respect to its speaker can be transferred to the movements of the poem itself: Whitman’s quill divides into fibers that sediment on the page where they generate the poem’s self-reflexive speaker who anticipates a fusion with an interlocutor and opens a passage for readers who may coalesce with the word-cells they are confronted with.

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NOTES

1 Walt Whitman, *Leaves of Grass* (Philadelphia: David McKay, 1891-92), 78. Available on the *Walt Whitman Archive* (www.whitmanarchive.org). Hereafter: LG1892.

2 Mose Velsor [Walt Whitman], “Manly Health and Training, With Off-Hand Hints Toward Their Conditions,” ed. Zachary Turpin, *Walt Whitman Quarterly Review* 33 (Winter/Spring 2016), 184-310, 216.

3 “Respiration,” *The Oxford English Dictionary*. Online version available on www.oed.com.

4 When he was asked about his profession, Duchamp used to say “Je suis un respirateur.” See, for example, Dalia Judovitz, “Rendezvous with Marcel Duchamp: Given,” *Marcel Duchamp. Artist of the Century*, ed. Rudolf E. Kuenzli and Francis M. Naumann (Cambridge: MIT Press, 1996), 199.

5 See Whitman, *Notebooks and Unpublished Prose Manuscripts*, Vol. 6, ed. Edward F. Grier (New York: New York University Press, 1984), 2032.

6 Joseph Priestly, *Disquisitions Relating to Matter and Spirit* (London: J. Johnson, 1777), xiii.

- 7 Ernst Lutze, *Die Germanischen Übersetzungen von Spiritus und Pneuma. Ein Beitrag zur Frühgeschichte des Wortes "Geist"* (Bonn: Rheinische Friedrich Wilhelms-Universität, 1960), 52, 60.
- 8 Henry George Liddell, and Robert Scott, *An Intermediate Greek-English Lexicon* (Oxford: Clarendon Press, 1889). Available on the Perseus Digital Library (www.perseus.tufts.edu).
- 9 Ralph Waldo Emerson, *Nature* (Boston: James Munroe, 1836), 34.
- 10 M. Jimmie Killingsworth, "Nature," *A Companion to Walt Whitman*, ed. Donald D. Kummings (Malden: Blackwell, 2006), 313.
- 11 R.W. French, "Whitman's Reading," *The Routledge Encyclopedia of Walt Whitman*, ed. J.R. LeMaster and Donald D. Kummings (New York: Routledge, 1998), 573.
- 12 *Oxford English Dictionary*.
- 13 Priestly, 172.
- 14 See *Origins of Stoic Cosmology*, ed. David E. Hahm (Columbus: Ohio State University Press, 1977), 70; Edward Vernon Arnold, *Roman Stoicism* (Freeport: Books for Libraries Press, 1971), 180-181.
- 15 *Selections from Early Greek Philosophy*, ed. Milton C. Nahm (New York: Appleton-Century-Crofts, Meredith Publishing Company, 1964), 43.
- 16 For a similar formulation of how the dead dissolve back into nature and persist in atomic form through breath and air see the following passage from Whitman's *Drum-Taps*: "Absorb them well, O my earth, . . . lose not an atom; / And you streams, absorb them well, taking their dear blood; . . . In blowing airs from the fields, back again give me my darlings—give my immortal heroes; / Exhale me them centuries hence—breathe me their breath—let not an atom be lost" ([New York: 1865], 71. Available on the *Whitman Archive*).
- 17 *Origins*, 163.
- 18 William Bechtel and Robert C. Richardson, "Vitalism," *Routledge Encyclopedia of Philosophy* (Abingdon, England: Taylor and Francis, 1998). Online version available on www.rep.routledge.com/articles/thematic/vitalism/v-1
- 19 *Selections*, 155.
- 20 *Selections*, 150.
- 21 Whitman, *Specimen Days*, in *Complete Prose Works* (Philadelphia: David McKay, 1892), 196. Available on the *Whitman Archive*.
- 22 *Specimen Days*, 196-197.
- 23 W.H. Dallinger, "Notes on the Science of the Month," *The City-Road Magazine* 6 (London: Wesleyan Conference Office, 1876), 187.

- 24 Matthias Jakob Schleiden, "Contributions to Our Knowledge of Phyto-genesis," *Scientific Memoirs*, ed. Richard Taylor (London: Richard and John E. Taylor, 1841), 281.
- 25 Rudolf Virchow, *Cellular Pathology* (New York: Robert M. De Witt, 1860), 54.
- 26 T. W. Rolleston drew Whitman's attention to Virchow in an 1882 letter. The context, however, is Virchow's criticism of Darwinism. See Thomas W. H. Rolleston to Walt Whitman, 26 December 1882. Available on the *Whitman Archive* (loc.02192)
- 27 See, for example, Alice Lovelace Cooke, "Whitman's Indebtedness to the Scientific Thought of His Day," *Studies in English* (1934); Joseph Beaver, *Walt Whitman, Poet of Science* (New York: King's Crown Press 1951); Robert J. Scholnick, "Science," *Routledge Encyclopedia of Walt Whitman*, 616-619; Harold Aspiz, "Science and Pseudoscience," *A Companion*, 216-232.
- 28 Whitman, *Specimen Days* 19.
- 29 Whitman, *Leaves of Grass* (Brooklyn, New York, 1855), vii. Available on the *Whitman Archive*.
- 30 Whitman, "Preface, 1876," *Specimen Days & Collect* (Philadelphia: Rees Welsh & Co, 1882-1883), 286.
- 31 Theodor Schwann, *Microscopical Researches into the Accordance in the Structure and Growth of Animals and Plants* (London: Sydenham Society, 1847), 161.
- 32 Schwann, 68.
- 33 *Oxford English Dictionary*.
- 34 As already mentioned, Whitman cited an article discussing William Crookes's research, which draws on the corpuscular theory of light; in summarizing Crookes, Dallinger mentions the "molecules" of light.
- 35 Schwann, 192.
- 36 Virchow, 47.
- 37 Gerald Karp, *Cell Biology* (Singapore: Wiley 2014), 6.
- 38 Schleiden, 281.
- 39 The same matter is also discussed by Virchow; interestingly, Virchow uses the term "individual" to address both the organism as a whole and its parts, the cells: "Hence it follows that the structural composition of a body of considerable size, a so-called individual, always represents a kind of social arrangement of parts, an arrangement of a social kind, in which a number of individual existences are mutually dependent, but in such a way, that every element has its own special action, and, even though it derive its stimulus to activity from oth-

- er parts, yet alone effects the actual performance of its duties” (Virchow, 40).
- 40 For a discussion of Whitman’s collaboration with Swinton and plausible evidence that some parts of *Rambles Among Words* were written by Whitman, see James Perrin Warren, “Whitman as Ghostwriter: The Case of *Rambles Among Words*,” *WWQR*, 2 (Fall 1984), 22-30.
- 41 William Swinton, *Rambles Among Words: Their Poetry, History and Wisdom* (New York: Dion Thomas, 1864), 10.
- 42 Greene, Roland et al., eds., “Inspiration,” *The Princeton Encyclopedia of Poetry and Poetics* (Princeton: Princeton University Press, 2012), 708.
- 43 See John B. Mason, “Oratory,” *Routledge Encyclopedia*, 489.
- 44 Allen Ginsberg, “Improvisation in Beijing,” *Collected Poems 1947-1997* (New York: HarperCollins 2006), 937.
- 45 Ginsberg, “Notes for *Howl* and other Poems,” *The New American Poetry 1945-1960*, ed. Donald M. Allen (Oakland: University of California Press, 1999), 416.
- 46 Mason, 489.
- 47 “To the Vanguard of Intelligence, Brandreth’s Pills,” *The New York Herald* (New York, Tuesday, April 17, 1849).
- 48 Balfour Slonim, *Respiratory Physiology* (Saint Louis: The C.V. Mosby Company, 1976), 10.
- 49 *Oxford English Dictionary*.