At the heart of this tradition is the scientific concept of polarity, which applies to an ongoing, dynamic process of reconciling opposing forces within nature. The German nature philosophers thought of all nature in terms of a dynamic, ongoing movement system which was propelled by the interaction of opposed but related forces, including the real and ideal, male and female, repulsion and attraction, centrifugal and centripetal, and self and external world. (Reconciling such opposites is both a subject and a structural principle in "Song of Myself.") The "development hypothesis" or evolution is a logical consequence of this idea of progress. For the progressive development of the universe takes place through the resolution of the fundamental opposites and antitheses in the world. A for-reaching egalitarianism is also implicit in this view of the world, because it does away with the notion of fixed hierarchies and substitutes a world in which change is an ongoing process. Since each side in the polar relationship contributes to the higher synthesis, it is impossible to rank one above the other. Hence this scientific tradition could be interpreted as supporting democracy. In 1876 Whitman, linked science and democracy by remarking that the "Leaves of Grass" is "to science adjusted, to perhaps born of, Democracy and Modern Science" (Comprehensive 751). During the 1840s and 1850s, as Godwin's "The Last Half Century" implies, romantic ideas such as polarity, equality, evolution, and the principle of the conservation of energy (the first law of thermodynamics) were finding empirical verification, confirming the assumptions of this tradition. Whitman was also attracted to phrenology, mesmerism, and other pseudosciences, which were the subject of great interest by a large and broad cross section of the population. Parke Godwin referred to those fields as "not yet science" and spoke of the "wonderful manifestations of Animal Magnetism, which are too well authenticated as facts to be denied, though not yet referred to any satisfactory laws" (168). Harold Aspin has shown that in such works as "I Sing the Body Electric," "Song of Myself," and "There was a Child Went Forth," Whitman incorporated ideas and images drawn from various pseudosciences. But he wrote as a poet, not as a scientist, and so avoided a literalism in the use of terms that would ultimately prove limiting. In a notebook entry included by Richard Maurice Bucke in "Notes and Fragments," he reminded himself, "Remember in scientific and similar allusions that the theories of Geology,
History, Language, &c., &c., are continually changing. Be careful to put in only what must be appropriate centuries hence" (55). This balance between a willingness to explore all manner of new thinking and a fundamental conservatis-
im in the area that mattered most, language, served Whitman well. He approached poetry and science as ways of knowing that were complementary but different. As important as science was to him, he carefully reframed its concepts within his poetry.

Whitman's ability to make use of scientific laws to articulate the interconnected lives of human beings with the external world is nowhere more evident than in "Song of Myself." The affectionate, sensual, hearty, electrical speaker articulates analogous qualities in the external world; informed by the principle of polarity, he depicts in section 3 the unfolding of self and the cosmos: "Out of the dimness opposite equal advancement, always substance and increase, always sex, / Always a lot of identity, always distinction, always a breed of life." The poem's most dramatic instance of the reconciliation of polar opposites occurs in section 5, where the speaker unites body and soul in an ecstatic union. What begins in 1800 as a statement of equality between two opposites, "I believe in you my soul, the other / I am not as you abuse yourself to, / And you must not allow the other," ends in rapturous bliss: "swiftly arose and spread around me the peace and knowledge that pass all the argument of the earth." That reconciliation leads to new insights and launches speaker and reader on a voyage of discovery. In bringing together sup-
posed opposites, the speaker articulates the principle of cosmic evolution: "All goes onward and outward, nothing collapses, / And to die is different from what any one supposed, and luckier ..." (section 6).

The theme of immortality is based on the scientific principles of Correlation of Forces and Conservation of Energy, which were just then being expanded by chemists and physicists alike—including Justus Liebig and Michael Faraday—were demonstrating that not even the smallest known element ever disappears but that elements are constantly being transformed. These ideas are developed throughout "Song of Myself," as in section 49, where the speaker offers an apostrophe: "O suns—O grass of graves—O perpetual transfers and promis-

This idea supports the fluid identity of a speaker who in section 16 "resist[s] any thing better than my own diversity." These principles

lie at the heart as well of the 1856 masterpiece "This Compost."

The process of articulating such fundamental principles gives the speaker imaginative con-
trol over them. In section 44 of "Song of My-
self" he reverses the process of evolution and imaginatively returns to the beginning of time, "the huge first Nothing, I know I was even there." His ability to recall all of evolutionary history is bolstered by his idea of romantic

nicity philosophy, that Ontogeny recapitu-
lates phylogeny: "Before I was born out of my mother generations guided me, / My embryo was not an origin, nothing could overlay it." Even as he can reverse time, so the speaker, "the acme of things accomplishment, and I am encloser of things to be," projects himself into the future, combining biology and astronomy, space and time, in a cosmic dance: "My feet strike an apex of the apices of the stairs, / On every step bunched of ages, and larger bunches between the steps, / All below duly travel'd—and still I mount and mount." In celebrating the evolutionary process—"Births have brought us richness and variety, / And other births will bring us richness and variety"—Whitman affirms the equality of all who are present in the cosmos: "I do not call one greater and one smaller; / That which fills its period and place is equal to any."

Given the centrality of science within the poem, the speaker feels the need to define boundaries, and in section 23 directly addresses the scientists: "Gentlemen, to you the first hon-
ors always! / Your facts are useful, and yet I judge not my dwelling, / I but enter by them to an area of my dwelling." During the antebellum period the growing prominence of science and its increasing specialization threatened to dis-
place writers. The word "science" has often been coined to refer to professional investigators, who were claiming for themselves the primary authority to know the external world. Whitman meets the issue head-on, appropriating for his own purposes the astounding insights of the scientists. But, as John Burroughs wrote in an essay on Whitman included in Birds and Poets with Other Papers: in his "through assimila-
tion of the modern sciences," he "transmuted[ed] them for strong poetic nutriment" (241).

In "Great are the Myths," an 1835 poem which he dropped from Leaves of Grass in 1881, he claimed that language itself is "the mightiest of the sciences, / It is the fulness, color, form, diversity of the earth, and of men and women, and of all qualities and processes. / It is greater than wealth—it is greater than buildings, ships, reli-
goins, paintings, music" (1860 Leaves). The poet's challenge, then, is to go beyond the sec-
cendhand reports, including those of idealistic conser-

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Scott, Sir Walter (1771–1832)
Sir Walter Scott was one of the most influential and prolific literary figures of the early nineteenth century. Scott achieved fame primarily as a writer of narrative poems, which include The Lay of the Last Minstrel (1805), Marmion (1808), and The Lady of the Lake (1810). Af-