



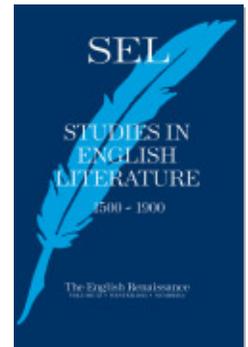
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The Intuitions of Analogy in Erasmus Darwin's Poetics

DEVIN S. GRIFFITHS

“Lunatic,” scientist, poet; Jacobin, physician, free lover—Erasmus Darwin set a wildly prolific example.¹ His florid intellectual and sexual life was mirrored by his infamous poetic work, *The Botanic Garden* (1789–91). A mixture of poetry and science, sex and Henry Fuseli engravings, *The Botanic Garden* has been fairly characterized as “one of the most extraordinary—some would say bizarre—works in English literature.”² Although renowned in his own time as a doctor, scientist, and philosophe, it was as poet that Erasmus Darwin would achieve greatest fame, influencing, often by counterexample, a generation of Romantic poets, particularly William Wordsworth, Samuel Taylor Coleridge, and Percy Bysshe Shelley.³ Coleridge alternated between admiration and disgust for Darwin and his work. If he lauded him as “the first *literary* character of Europe, and the most original-minded man,” he simultaneously reviled the thematic turns of his verse, famously declaring, “I [am] absolutely nauseate[d by] Darwin’s poem.”⁴ Such eradivative views ultimately led to Darwin’s fall from a rumored candidacy as poet laureate to an object of derision at the close of the eighteenth century, uprooted by the incisive critiques of British Romanticism and a new fin-de-siècle moralism.

Literary historians have attributed the elder Darwin’s fall largely to two conditions, the first political and the second literary. Darwin’s left-wing politics and Jacobin sympathies made him a prominent target for the broad conservative backlash in the wake of the French Revolution. And, steeped in the rhyming

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iambic couplets and Latinate syntax of Augustan poetry, the “Darwinian” style struck a sharp contrast to Wordsworth’s and Coleridge’s poetic revolution—the new prosodic style and “real language of men” showcased in the *Lyrical Ballads*.⁵

Recent criticism suggests another contributing factor in Darwin’s devaluation: perhaps the generic mixing of Darwin’s work—its peculiar blend of scientific and literary speculation—alienated it from literary and scientific audiences alike. Even his grandson Charles criticized the strange brew offered in Darwin’s writings, allowing that his grandfather was inhibited by an “overpowering tendency to theorise and generalise” and upstaged by the “vividness of his imagination.”⁶ Noel Jackson has recently attributed this hybridity (as well as Darwin’s politicizing poetics) to a thoroughgoing Lucretian hedonism. Along the way, Jackson contributes to an emergent scholarly consensus that Darwin’s theory of analogy—set out most clearly in his *Zoonomia* (1794–96)—can help explain the relationship between his scientific and poetic writings.⁷ Catherine Packham proposes a reevaluation of Darwin’s poetics in *The Loves of the Plants* (1789) that focuses on his personification. Such a focus, Packham argues, would situate Darwin’s aesthetics within a theory of analogy that establishes connections between human behavior and other forms of life.⁸ Dahlia Porter has similarly expanded on the relation between Darwinian analogy and empiricism, exploring how his scientific insights develop through allied poetic devices.⁹

And yet, I will argue that *Zoonomia* advances a theory of analogy that disrupts the tropological understanding of analogy on which these discussions are founded and produces a thoroughgoing reevaluation of analogy’s role in cognition, poetics, and prosody itself. In this article, I examine two less-appreciated aspects of Darwin’s understanding of analogy as it bears upon his theory of mind. First, I locate Darwin’s faculty psychology within contemporary debates over the validity of analogy in philosophical and scientific discourse. Insofar as both skeptical philosophy and natural theology focused upon an attempt to specify what kinds of knowledge could be learned from external evidence and how to apply that knowledge to mental and spiritual life, skeptics as well as natural theologians turned regularly to comparisons couched in analogy, even as they challenged analogy’s value. Second, I examine *Zoonomia*’s investment in the physiological features of analogy as a solution to the epistemological problem of Enlightenment philosophy: how should we characterize the mental interface between sensation and natural knowledge?

Central to Darwin's literary achievement, this naturalization of analogy as a complex of innate mental faculties transformed his understanding of the patterns that underpinned all aspects of poetic form, particularly rhythm, rhyme, and meter. I conclude by suggesting how this sensationalist poetics shaped his *Economy of Vegetation* (1791), published with *The Loves of the Plants* as the two-volume *Botanic Garden*.

I

In *Zoonomia*, the scientific thesis he drafted alongside *The Botanic Garden* and published immediately after, Darwin emphasizes "rational analogy" as the scientific key to recognizing nature's relationships: "The great CREATOR of all things has infinitely diversified the works of his hands, but has at the same time stamped a certain similitude on the features of nature, that demonstrates to us, that *the whole is one family of one parent*. On this similitude is founded all rational analogy; which so long as it is concerned in comparing the essential properties of bodies, leads us to many and important discoveries."¹⁰ Yet Darwin sounds a cautionary note, as analogy's potent associative power can also corrupt scientific inquiry: "but when with licentious activity it [analogy] links together objects, otherwise discordant, by some fanciful similitude; it may indeed collect ornaments for wit and poetry, but philosophy and truth recoil from its combinations" (1:1–2). This passage has been taken as a succinct presentation of the basic project of Darwin's various scientific and poetic pursuits: to explore natural patterns and give them literary form. Here, Darwin frames this relationship as a distinction between analogy's rational and witty faces. But in the context of contemporary and ongoing evaluations of the fusion of scientific and literary impulses in his work, the discretion Darwin emphasizes here presents a problem. Why insist on this distinction only to graft scientific discourse to literary style, philosophy to poetry?

I suggest another way to read this passage: in place of taking it as a focused credo, Darwin's statement should be understood as an omnibus critical gesture, that is, a sophisticated acknowledgment of the abundant criticism of analogy expressed in contemporary philosophical and rhetorical treatises. I will elaborate the conditions of this criticism later, but to take a brief example, Dugald Stewart, in the first volume of his *Elements of the Philosophy of the Human Mind* (1792), associated analogy with all forms of wit and allusion, and made the lesser poet's willingness to trace

analogies for their own sake the essential diagnostic distinction between the “perfect” allusions of “serious poetry,” and those examples, as in the “allusions of [Abraham] Cowley and [Edward] Young, [in which] the Fancy of the Poet degenerates into wit.”¹¹

Such criticism of analogy's abuse reversed centuries of thought; until the eighteenth century, philosophers of many stripes had afforded analogy ever-wider authority as a tool of natural and revealed understanding. For Aristotle, analogy (or *ἀνάλογος*—literally “according to a due λόγος, proportionate, comformable”) was a term describing accordance to a rule of relation.¹² In its mathematical sense, it represented a four-part relation of proportions, in which two ratios were compared, for instance, 1/3 to 2/6.:¹³ hence the general definition of analogy as a comparison between two relationships (A is to B as C is to D) rather than individual terms (A is like C). In the *Posterior Analytics*, Aristotle developed analogy into this more general class of pattern recognition, formulating a comparative approach capable of tracing relationships between discrete domains of natural knowledge, and allowing evidence to be drawn from disparate genera.¹⁴ This elaboration of analogy as a method for analyzing patterns common to different systems of knowledge was invoked by biblical hermeneutics and Christian ontology as a method for drawing connections between distinct textual or ontological systems; hence, for Saint Augustine, analogy could serve to sift and reconcile discrepancies between the Old and New Testaments, while for Thomas Aquinas, it laid the groundwork for extending our knowledge of mundane properties to their divine counterparts.¹⁵ By the early modern period, analogy subsumed several other categories of interpretation (particularly allegory and parable), and this shift culminated in a final reversal: analogy completely usurped the primacy of biblical interpretation, and natural theology became the preeminent articulation of the relation between nature and God (rather than revealed religion). As Victor Harris puts it, “The final stage in this process coincided with the resurgence of ‘divine analogies’ between spirit and nature. Allegories were converted from figure to argument, and survived only by translation into the more precise idiom of analogy.”¹⁶ With more than a dozen editions by 1800, Joseph Butler's *Analogy of Religion* (1736) serves as the dominant expression of analogy's place in eighteenth-century thought. Yet in a marked departure that illustrates analogy's increasingly unstable place within philosophical discourse and even natural religion, Butler deploys analogy in an exclusively negative sense, using it to map extant criticisms of Christian doctrine onto the deism

that purported to replace it.¹⁷ Hence, when Darwin attributes the “certain similitude on the features of nature” to the “hands” of the “CREATOR,” he alludes to a tradition of natural religion already under considerable pressure.

The internal critique of analogy’s place in natural theology was anticipated by eighteenth-century rhetorical treatises, which described analogy as a class of rhetorical argument and questioned its epistemological claims. At least one contemporary theorist of rhetoric, George Campbell, posited that *all* rhetorical comparisons were examples of analogy and linked it to “all those other rhetorical tropes and figures [that are] addressed to the imagination,” including simile, metaphor, allegory, and prosopopeia.¹⁸ As Packham notes, Campbell’s *Philosophy of Rhetoric* (1776) analyzed analogy as a class of “moral evidence”—those arguments that, unlike the syllogisms of logic, are uncertain or merely probable.¹⁹ Campbell separates evidence by analogy, “founded on some remote similitude,” from the evidence of actual experience, including scientific experiment.²⁰ As an illustration, Campbell asserts that if a scientist proves by experiment the circulation of blood in the human body, he has from experience evidence that blood circulates in other animals. “But should I from the same experiment infer the circulation of the sap in vegetables,” he continues, “this would be called an argument only from analogy.”²¹ He distinguishes proper use of analogy by derivation: analogy is illegitimate for science because it is based upon “remote similitude.” Most problematically, rather than marking a formal discrimination (for example, analogies take the form “A is to B as C is to D”), we have to judge how proximate or “remote” the comparison is to decide whether to classify it as evidence or analogy. Campbell argues the evidentiary value of blood circulation experiments because “when we consider the great similarity which other animal bodies bear to the human body ... particularly when we consider the resemblance of the blood itself, and blood vessels, and in the fabric and pulsation of the heart and arteries, it will appear sufficient experimental evidence of the circulation of the blood in brutes.”²² The form of Campbell’s “experiential” argument—a multipart comparison that justifies the application of knowledge to different cases—is evidently analogical. Common in contemporary works of anatomy, in the early nineteenth century this exact class of physiological comparison is designated “analogy” by Geoffrey St. Hillaire and Richard Owen.²³ By making a distinction in degree, rather than kind, Campbell registers a concern for the inappropriate uses of analogy (in “remote similitude”) while reserving more proximate

forms of analogy (those of "great similarity") for scientific use—albeit by another name.

Campbell's opposition of the modern term "similarity" to the more archaic "similitude" (closely associated with rhetoric) suggests, for the discourse of analogy, how epistemological distinctions between scientific and nonscientific knowledge were expressed through oppositions between the newer empiricist vocabulary of sensationist philosophy and older rhetorical terminology.²⁴ Insofar as analogy was viewed as a class of rhetorical argument, its claim to lead science (in the words of Darwin) to "many and important discoveries" suffered (1:1). Such criticism of analogy, however qualified, put the onus upon practitioners such as Darwin to distinguish their comparative method from other forms of literary or rhetorical expression. Peter Browne, in his *Things Divine and Supernatural Conceived by Analogy with Things Natural and Human* (1733), establishes the grounds for his argument for revealed religion by carefully defining the difference between metaphor, "Substitution ... on Account of an *Appearing Similitude* only," and analogy, "Substituting ... on Account of a *True Resemblance*."²⁵ As we have seen, this opposition between "*Appearing Similitude*" and "*True Resemblance*" was later reversed by Campbell, but both Browne and Campbell collaborate in their effort to clarify the putatively hazy relationship analogy bore to proper philosophical discourse and to rhetoric. This dilemma helps situate Darwin's elaborate coordination of rhetorical and natural theological perspectives in the passage with which we began: in arguing that analogy rests upon an essential "similitude" "stamped ... on the features of nature," Darwin demonstrates his sensitivity to analogy's rhetorical connection while naturalizing the patterns it recognizes, and hence, places those patterns beyond rhetoric's argumentative framework.

Colin Jager has given extensive attention to the challenges of this "rhetoric of analogy" for late-Enlightenment theorists of natural theology, arguing that, for both Immanuel Kant and William Paley, analogy stood as an uncertain but unavoidable class of rhetorical argument.²⁶ The legacy of the eighteenth-century critique of analogy extends to modern Romantic scholarship, in which analogy has served as a staid Augustan trope supplanted in Romantic poetry by more organic modes of expression such as symbol and metaphor. In his classic *The Mirror and the Lamp*, M. H. Abrams argues that Romantic aesthetics marked a formative turn away from systematic poetic analogies toward the spontane-

ous “myth in process” of “[s]ymbolism, animism, and mythopeia [sic].”²⁷ And in *The Subtler Language*, Earl R. Wasserman argues that the extensive analogies between divine and mundane order—central to natural theology—began to collapse at the close of the eighteenth century, as analogy was demoted to a form of “mental fiction”: “analogy, being itself meaningless, [could] no longer organize reality and experience.”²⁸

This thesis of a Romantic break with analogy overlooks the substantial effort to rehabilitate such comparisons in the eighteenth and nineteenth centuries, as writers such as Darwin (and even Campbell) retheorized analogy as a tool of scientific naturalism capable of disclosing the relationships that underpinned the natural order.²⁹ Though Darwin acknowledges his sensitivity to analogy’s “licentious” literary and rhetorical aspects at the opening of *Zoonomia*, in the same breath, he emphasizes the centrality of analogy to his science; the effect is to register analogy’s critique in service of its refurbishment as a naturalized epistemology. As the treatise develops, it becomes clear that Darwin has reworked analogy into a function that no longer resembles either rhetorical trope or divine ontology. Instead, he conceives of analogy as a key component of experience, harnessing the empiricist theories of John Locke and David Hume in a thoroughgoing transformation of analogy’s foundation and status.

II

The empiricist philosophy of mind developed by Locke and Hume is central to the associative psychology by which *Zoonomia* justifies analogical science. Darwin refers to Locke and Hume throughout his work, and specifically connects analogy to Hume’s category of resemblance (1:52–3). In doing so, he echoes Stewart, who had earlier criticized Hume’s three categories of association—resemblance, contiguity of time and space, and cause and effect—by arguing both that there was substantial overlap and that they could easily be enlarged to include relations of analogy, as well as other relations of similarity.³⁰ But resemblance is only casually tied to analogy by Hume, as when he suggests, in *A Treatise of Human Nature* (1739–40), that “resemblance is a source of reasoning and analogy, and leads us to attribute the same qualities to the similar objects.”³¹ Though turning several times to general analogies in order to pursue broad arguments, Hume only treats analogy directly as a minor form of probability (after probability of cause and probability of chance), that is, as

a third way to gauge past experience in order to judge the likelihood of a given outcome.³²

Yet the *Treatise* helps to demonstrate how analogy remained a touchstone for comparativism within works of empiricist and moral philosophy. Though Hume constrains the role analogy plays in his *Treatise*, Packham has observed that “Common Sense School” critics such as Thomas Reid and Stewart accused him, along with other philosophical empiricists, of more comprehensive analogical reasoning.³³ Moreover, in both Reid’s *Inquiry into the Human Mind* and Stewart’s *Elements of the Philosophy of the Human Mind*, it is striking how, even as they argue that Hume and other empiricists drew a false analogy between mechanical and mental processes, these critics enlist supporting arguments “from analogy” and root their approach in a methodological analogy between anatomy and mental investigation.³⁴ Such responses to Hume, along with Hume’s own work, demonstrate how Enlightenment philosophers, reacting to the epistemological crisis produced by the skeptical problem of the relation between the world and the mind, enlisted analogy beneath various argumentative and conceptual banners.

From the perspective of the critical role analogy played in disputes over skepticism, the elegance of Darwin’s response becomes clear. In criticizing empirical philosophers for drawing analogies between mental and physical phenomena, Reid and Stewart essentially doubled down on skepticism: the insufficiency of analogy served as another example of the division between thought and the physical world. And as we have seen, *Zoonomia*’s preliminary discussion of analogy as a method seems to be of a piece with such writings, insofar as it endorses a methodological understanding of analogy rooted in the terms of contemporary moral philosophy and belletristic rhetoric. But the theory of analogy that Darwin goes on to develop in *Zoonomia* is not rooted in considerations of method per Reid and Stewart, and instead of imagining analogy as a *response* to the skeptical divide between perception and object, Darwin conceives of analogy as a major *component* of the mediation of sensation and experience.

Initially, Darwin’s understanding of analogy seems in line with Hume’s, as when he remarks that “Those who have connected a great class of ideas of resemblances, possess the source of the ornaments of poetry and oratory, and of all rational analogy” (1:52–3). This makes analogy, at least in its “rational” form, ancillary to the mechanisms of perception, inasmuch as resemblance is one of the components of the connection of ideas and secondary

to experience itself. But Darwin's discussion of "intuitive" analogy makes it clear that such pattern analysis runs deep. The passage comes at the close of a long discussion upon the "catenation" or patterning of sequential motions, e.g., in musical performance (1:190–2). In addition to these sequences of motion, he theorizes, there are "temporary catenations of ideas" produced by imagination (1:196). These chains of associated ideas (e.g., daydreams) are regularly interrupted, and he observes that, often, these interruptions occur when an idea "is incongruous to our former experience" (1:196). In order to explain this observation, Darwin suggests that we constantly and unconsciously employ "INTUITIVE ANALOGY" to compare our current thoughts to previous experiences and to reject associations that violate the patterns laid down by those experiences. He elaborates: "It is an act of reasoning of which we are unconscious except from its effects in preserving the congruity of our ideas, and bears the same relation to the sensorial power of volition, that irritative ideas, of which we are unconscious except by their effects, do to the sensorial power of irritation" (1:196). Leaving aside the second-order analogy within which this explanation of analogy is couched ("INTUITIVE ANALOGY" is to volition as irritative ideas are to sensation), Darwin establishes in this passage a form of analogy that is both "unconscious" and essential to all "congruous" trains of thought. And it takes for its model the relation between sensation and simple idea that underpinned Locke's analysis of thought and upon which Hume founded his own understanding of the relationship between simple impressions and simple ideas. Darwin emphasizes that this analogy is "intuitive" (the only use of this Lockean term or its cognates within *Zoonomia*), insisting that this perception of pattern is immediate, unmediated, and unconscious. Just as simple ideas represent the unconscious consolidation of basic sensations, intuitive analogy explains the mind's unconscious consolidation of the basic patterns of experience. From our own perspective, the relationship that Darwin establishes between the conscious formulations of "rational" analogy and the unremarked, background formulations of "intuitive" analogy anticipates latter-day interest in the interactions between explicit and tacit knowledge formation. This distinction has been influentially developed by Pierre Bourdieu through his emphasis on "habitus," or more recently, Charles Taylor in his work on the "social imaginary." Taylor has ascribed this shift to the influence of Martin Heidegger's description of the differences between representations of the world and what it is to "be in the world."³⁵ While Darwin does not make the case

explicitly, his work suggests that "rational" analogy represents, within a sensationist framework, the *conscious* formalization of the patterns processed *unconsciously* by intuitive analogy.

Seen in this light, intuitive analogy becomes central to Darwin's response to the skeptical dilemma, as it addresses the problem of external knowledge by positing a faculty whose entire function is to capture consistency within experience, and to tie our thoughts to that consistency. Intuitive analogy does not dissolve the skeptical problem, but it does read analogy into the mechanisms that generate skepticism, naturalizing analogy as part of the sensational mechanism, rather than as a trope or form of argument. As a response to the skeptical dilemma, it bears comparison to the arguments of the Scotch "Common Sense School."³⁶ But whereas Reid and Stewart root their assertions of "common sense" in the universality of common beliefs or dispositions, Darwin's intuitive analogy is rooted in a proposed common faculty. For this solution to work, it is necessary to posit that nature is, in fact, patterned—that the similitudes produced by those faculties are real. Built into Darwin's system is an assumption of coherence, which posits, on the one hand, the objective existence of a natural order of relation and, on the other, corresponding mental faculties—intuitive and rational analogy—that can apprehend this order. Darwin could have justified this coherence on Humean grounds, arguing (as Hume does for causation) that our continual experience of a pattern justifies our confidence that we will continue to experience that pattern.³⁷ Instead, as we have seen, he relies upon the assertion from natural theology that nature is "stamped" with patterns. Darwin is an analogical realist. But, instead of serving Christian apologetics as proof of God, Darwin's analogy of nature is designed to yield basic insights into the patterns of nature: it argues for a nature that is both coherent and intelligible, hence, accessible to empiricist inquiry. This point is driven home by the very language that would seem to belie it. By emphasizing that the "CREATOR of all things ... stamped a certain similitude on the features of nature," Darwin revived the language that Locke had singled out in his critique of innatism (the claim, in Locke's words, that some ideas are "stamped upon the mind of man"), while extending this claim to the natural world.³⁸ Yet by the same measure, Darwin's formulation is greatly qualified when contrasted with, for instance, the ontology argued by Locke's contemporary, Edward Stillingfleet, through his assertion that "*God hath stamped an universal character of himself upon the minds of men.*"³⁹ Darwin's agent is not God but the impersonal "CREATOR,"

the origin of his characters is ambiguous, their placement in the world *and* in the mind. The hierarchy of being is modulated into the patterns of nature. A key influence of this naturalized analogy is Darwin's theory of the common origins of life. In his famous discussion of the "living filament," Darwin uses an argument from the analogy of structure that exists between living creatures as the capstone evidence for the common descent of all warm-blooded animals (1:507–8). In this way, Darwin's naturalization of intuitive analogy participates in the larger secularizing impulse that shifts such structural comparison from providing evidence of a common design to providing empirical support for particular scientific theories.

III

Perhaps of greatest interest is how Darwin's theory of analogy establishes a conceptual framework for exploring scientific pattern through poetic expression. If humans are like other creatures because they share a common descent, as Porter and Packham have pointed out, techniques such as personification can instantiate that similarity in poetry. Hence the great conceit of *The Loves of the Plants*: to re-create the Linnaean classification system—rooted in the number and deployment of sex organs—as an orgiastic pastoral of amorous nymphs and swains. But as *Zoonomia* makes clear, Darwin's understanding of the role of analogy in poetic form is far more ambitious. In line with his sensationist theory of analogy, Darwin extends the relationship between nervous sensation and coherence into a sensitive theory of prosody and music. Just as, in intuitive analogy, Darwin had designated an unconscious faculty that recognizes the patterns of coherence between the subject's present understanding and past experiences, he theorizes an unconscious faculty of sensational analysis that compares present *sensations* to previous sensitive patterns. Discussed under the broad heading of "repetition," Darwin argues, in line with Burkean aesthetics, that repetitions of both actions and ideas stimulate this pattern-matching faculty and bring pleasure.⁴⁰ In Darwin's view, the unconscious experience of repetition is a condition of poetry's possibility, because comparison and pattern recognition underpin meter itself: "To the facility and distinctness, with which we hear sounds at repeated intervals, we owe the pleasure, which we receive from musical time, and from poetic time ... And to this the pleasure we receive from the rhimes [*sic*] and alliterations of modern versification" (1:251). Campbell had already tied

poetic patterning to the connections of analogy, when he argued that analogy and even alliteration are classes of Humean resemblance.⁴¹ But Darwin takes this for a more specific insight into the motive of poetic structure, arguing that it is this sense of correspondence over time, assonance in dissonance, rhythm in noise, which underpins poetry. From rational analogy, to intuitive analogy, to the patterns of sensation itself, Darwin theorized the mind as a comprehensive analogical engine that analyzes patterns to produce philosophical thought, intellectual coherence, and musical pattern. In this light, the power of analogy to expose the similitudes of nature extends beneath poetic figuration into the physical sensations that structure rhythm and rhyme.

I would like to clarify the poetic application of Darwin's theory of analogy by turning to a passage from *The Economy of Vegetation*, the first book of *The Botanic Garden*. In an oft-discussed passage that has not yet received close metrical attention, the intertwined order of the nascent cosmos is echoed by enchained rhythmic analogues. Rewriting Genesis's account of the creation of the universe, Darwin imagines God's first command rebounding through the cosmos, sparking a series of nebular transformations: chaos is called to order, and the galaxies, stars, planets, and, eventually, our own sun and earth, spin into existence. The passage begins with the strong departure of an initial inversion—the opening dactyl establishing God's missive as a strong, hermetic phrase—“LET THERE BE LIGHT” (emphasis added)—an initial inversion that periodically returns in the following lines (marked with asterisks):

 / \ x / x / x x / x /
 * ‘LET THERE BE LIGHT!’ proclaim’d the ALMIGHTY LORD,

x / x /x / x / x /
 Astonish’d Chaos heard the potent word;

 x / x / x / x / x /
 Through all his realms the kindling Ether runs, 105

x x / / x x x / x /
 And the mass starts into a million suns;

 / \ x / x / x / x /
 *Earths round each sun with quick explosions burst,

x / x / x / x x x /
 And second planets issue from the first;

/ x x / x x x / x /
 *Bend, as they journey with projectile force,

x / x / x / x / x /
 In bright ellipses their reluctant course; 110

/ x x / x / x / x /
 *Orbs wheel in orbs, round centres centres roll,

x / x / x / x / x /
 And form, self-balanced, one revolving Whole.

/ x x / x / x / x /
 *—Onward they move amid their bright abode,

/ x x / x / x x x /
 *Space without bound, THE BOSOM OF THEIR GOD!⁴²

This passage forms a poetic cosmos of its own, the irregular pattern of the first line echoing as the passage unfolds, ultimately returning again to its starting point, God. This irregularity also disturbs the metrical pattern. In *Zoonomia*'s discussion of the association of sense that underpins poetic verse, Darwin stresses that these "little circles of musical time" owe their power to the pattern they establish and emphasizes their regularity: "Whether these times or bars are distinguished by a pause, or by an emphasis, or accent, certain it is, that this distinction is perpetually repeated; otherwise the ear could not determine instantly, whether the successions of sound were in common or in triple time" (1:251). On this view, initial inversions, by destabilizing the rhythm, should confuse the ear and frustrate the poem's ability to produce pleasure.

Yet this rhythmic departure calls attention to a larger pattern. Line 111 exhibits a finely worked balance of rhythm and word. With the preposition "in" as the only exception, all the words in line 111 deal with circularity, rearranging pairs of terms (Orbs^wheel, round^centres) so that they express a range of functions. The effect is a resonance of meaning, in which the sound and sense of these "little circles" reverberate in inverted pairs that cohere in "one revolving Whole" of correspondences and extension. The

comparison that is mapped between the lines containing initial inversions—each of which, except the last, forming the first complete phrase that founds a new independent clause—emphasizes the ramification of the initial command throughout various corresponding cosmic valences, from the creation as a whole, to the particular organization of the solar systems, and finally to an archetypal description of all these motions, where “Orbs wheel in orbs, round centres centres roll.” Hence circular patterning, much like analogy itself, serves as a master figure for cosmogony and the inheritance of Judeo-Christian thought within a worldview characterized by mechanism and natural pattern.

Certainly, initial inversions are common features of iambic verse—they appear regularly in Alexander Pope’s poetry, for instance, in his translation of *The Iliad* (1715–20). One noticeable example, drawn from *The Rape of the Lock* (1712–14), mirrors line 111 above, employing a commensurate syntax and lexical pairing. The poet describes how female virtue is guarded by the counterbalancing attentions of competing men:

x / x / x / x / x
Where wigs with wigs, with sword-knots sword-knots

/
strive,

/ \ x / x / x / x /
Beaux banish beaux, and coaches coaches drive.⁴³

Here, as in line 111 of Darwin’s poem, the subjects and objects are identical noun pairs, and the second line—also as in Darwin’s lines—employs an initial inversion that serves to emphasize this pairing by distorting the normal iamb.

In both poems, the initial inversion, along with the caesura, works to balance the line as a whole by producing a slight demotion of the fourth stress. But there is a sharp difference in the purpose this balancing of phrase serves in the two poems. In *The Rape of the Lock*, the coordination emphasizes the tautological aspect of the line’s paired subjects and objects—enforcing rhythmically a sense of futile negation. In Darwin’s poem, however, these pairings emphasize the network of relationships—the analogies interlinking the various valences of the cosmic system. To elaborate, in the lines we are examining from *The Economy of Vegetation*, the initial inversion, combined with a secondary stress in the first

phrase that induces a slight hesitation after the first stress, slows the line through the intrusion of a four-beat accentual line into the pentameter. To demonstrate this for Darwin’s poem, I have rescanned these lines in four-beat accentual meter:

$\underline{['] \ \backslash \quad x \ \underline{\quad} \quad [/] \ x \ \underline{\quad} \quad \quad \quad x \ x \ \underline{\quad} \ \ x \ \underline{\quad} \quad [x \ /]$
 ‘LET THERE BE LIGHT!’ proclaim’d the ALMIGHTY LORD

 $\underline{\quad} \ \underline{['] \ \backslash} \quad \quad \quad x \quad \underline{\quad} [/] \ x \quad \underline{\quad} \ \ x \ \underline{\quad} \ x \quad \underline{\quad} \ \underline{\quad} \ [x \ /]$
 Earths round each sun with quick explosions burst,

 $\underline{\quad} \ \underline{['] \ \backslash} \ x \ \underline{\quad} \ [/] \ x \quad \underline{\quad} \ \ x \ \underline{\quad} \ \ x \ \underline{\quad} \ [x \ /]$
 Orbs wheel in orbs, round centres centres roll,

The introduction of elements of the quaternary line casts an enhanced degree of order over the loose structure of iambic pentameter—an order that resolves into four nearly untroubled beats in the final line:

$\underline{\quad} \ \ x \ x \quad \underline{\quad} \quad \quad \quad x \ \underline{\quad} \ ' \ \ x \ \ x \ \underline{\quad}$
 Space without bound, THE BOSOM OF THEIR GOD!

This structure affects the sensation of a four-beat line pressing through the pentameter, a line that emphasizes the pairing of the first and second and the third and fifth beats (what Derek Attridge has termed “sprung pentameter”).⁴⁴ As Darwin himself argues in *Zoonomia*, “repetition recurs more frequently” in four-beat meter than in less-organized verse forms such as pentameter (1:252).

The intrusion of the four-beat line here cultivates a more comparative texture in the pentameter, as the internal rhythmic pairing emphasizes the juxtaposition of terms—the slant rhyme of “LET”/“LIGHT,” the oppositions of “Earths”/“sun,” “Orbs”/“orbs,” “Space”/“bound,” the divine cogency of “proclaim’d”/“LORD,” and, finally, a return to metric and typographic coherence in “BOSOM”/“GOD.” The rhythm powers a dynamic rhythmic analogy within and between the phrases of each line. In *Zoonomia*, Darwin describes how such larger patterns amplify the pleasure of metric pattern: “besides these little circles of musical time, there are the greater returning periods, and the still more distant choruses, which like the rhimes [*sic*] at the ends of verses, owe their

beauty to repetition" (1:252). Within the poem, the dissemination of these rhythmic pairings corresponds metrically to the rhymed couplets themselves—an assonance that finds its pattern in the missive that metrically and scripturally starts it all off: "LET THERE BE LIGHT!" (emphasis mine).⁴⁵ Just as circular motifs coordinate the language of the passage, analogical structure serves to coordinate its patterns. Indeed, circular movement of the type Darwin describes served as the lynchpin of Pierre Simon de Laplace's nebular hypothesis, as well as the self-similarity later emphasized to such great effect, for example, in Robert Chambers's *Vestiges of Creation*.⁴⁶ Moreover, it is striking to note how closely this network of circular relationships echoes the meter as well as the larger theorization of interlocking analogies of mind and nature upon which Darwin's *Zoonomia* turns.

The larger rhythmic issue is that in such passages Darwin's poetic theory—which emphasized an analogy of sound and sense—pushes away from the foot-based classical orthodoxy of the Augustan period toward a four-beat accentual base that emphasizes internal pairings of word and beat. An ironic counterpoint to Darwin's critical location as a Romantic foil, this aligns such moments in Darwin's poetry with the popular four-beat ballad verse soon transformed in the *Lyrical Ballads*.

Such moments in Darwin's poetry suggest that, in his own manner, he pushed toward developing a naturalized poetic form that could express his analogical theory of meter—though to different effect than Wordsworth's "real language of men." These lines stand as further evidence of Darwin's practical rejection of the distinctions advanced in the opening of *Zoonomia*, between the "rational" analogy of philosophy, and the "ornaments [of] wit and poetry." Analogy, in Darwin's work, is not rhetorical art; rather, it is a condition of our experience of the world as patterned and intelligible. Darwin's poetry is a key example of what Peter Hans Reill has termed "Enlightenment vitalis[m]": the interpretation of nature as "a complex gradation of species that could be classified according to degrees of resemblance or similarity ... [A]ll of nature was connected through sympathies, rapports, or affinities."⁴⁷ For Darwin, the relational logic animating his poetry is endorsed by a world permeated with analogies. The epic vision of Darwin's poetry—from the florid sympathy of *The Botanic Garden* to the continuous development of nature and humanity enshrined in *The Temple of Nature; or, the Origin of Society* (1803)—is a sweeping attempt to cultivate the patterns underpinning natural history, human history, and sensation itself.⁴⁸ It was the sheer scope of

this effort that inspired Darwin's contemporaries—even if its particular achievements were largely remaindered by history. In ambition, Darwin's theory of analogy, with its commitment to the world-descrying powers of pattern and meter, matches Shelley's more focused brief for poetry's capacity in his *Defence of Poetry* (1821), which assigns the most profound discoveries of science and political theory to poetry's ability to "mark[] the before unapprehended relations of things" in "similitudes." If Shelley averred that poets were "the unacknowledged legislators of the world," he did so decades after Darwin expanded their portfolio and gave their far-reaching poetic faculties a specific physiological habitation and a name.⁴⁹

And it is on this basis, that is, on Darwin's focused reevaluation of the role of analogy, rather than upon the mixed legacy of his poetic accomplishments, that his later significance should be weighed. The nineteenth century was an age of analogy, as scientists and writers used comparative investigation to conceptualize and clarify their most profound ideas about physics and biology, social order and historical change. From James Clerk Maxwell's discovery of the correspondence between magnetic and electrical equations, to the comparative anatomic analyses of Jean-Baptiste de Lamarck, Georges Cuvier, and Owen; from the "analogical method" of Edward Bulwer Lytton's historical novels to the historiography of George Eliot's "analogical hypothesis"—nineteenth-century writers found analogy a powerful tool for inquiry into the nature of connection itself.⁵⁰ If poetry did not assume the full cultural authority that Shelley imagined, the operations of analogy did.

It was perhaps this ability to invoke the far-reaching implications of the relationships that lay beneath nature's placid surface that continued to attract Darwin's grandson to his theories. Though he may have distanced himself publicly from his grandfather's most liberal tendencies, when Charles Darwin sat down and opened his secret "B" notebook for the first time—the private journal he filled with "a machine-gun-like effusion of telegraphic jottings" that culminated in his *Origin of Species* (1859)—he began by writing a single word at the top: "Zoonomia."⁵¹ In his grandfather's broad vision of nature's ramified connections, Charles Darwin discovered an inspiring view of nature's dynamic patterns that echoed his own and lifted what an evolutionary biologist has recently typified as a "rich and fertile mind, with a holistic view of nature. One that sees the interconnectedness of living beings."⁵² Analogy, homology, correspondence; continu-

ity and difference, pattern and distinction—these were the raw materials of the theory of natural selection. Erasmus's analogies lent Charles, in the privacy of his study, the electrifying sense of intellectual inheritance: the observation that the whole is one family of one parent.

NOTES

¹"Lunatic" was a sobriquet Erasmus Darwin adopted with fellow Lunarian Joseph Priestley. For an extended discussion of the Lunar Society and Darwin, see Jenny Uglow, *The Lunar Men: Five Friends Whose Curiosity Changed the World* (New York: Farrar, Straus, and Giroux, 2002), especially pp. 323–429.

²Uglow, "Sexing the Plants," *The Guardian*, 21 September 2002.

³This is the burden of Desmond King-Hele's *Erasmus Darwin and the Romantic Poets* (New York: St. Martin's Press, 1986) and of Nicola Trott's "Wordsworth's Loves of the Plants," in *1800: The New "Lyrical Ballads,"* ed. Trott and Seamus Parry, *Romanticism in Perspective: Texts, Cultures, Histories* (New York: Palgrave, 2001), pp. 141–68. Michael Page argues, more broadly, for the larger continuity of Darwin's poetics with Romantic tradition ("The Darwin before Darwin: Erasmus Darwin, Visionary Science, and Romantic Poetry," *PLL* 41, 2 [Spring 2005]: 146–69). I agree with Noel Jackson's recent caution that "a great deal remains to be said" about the qualities of this influence ("Rhyme and Reason: Erasmus Darwin's Romanticism," *MLQ* 70, 2 [June 2009]: 171–94, 176n15).

⁴Samuel Taylor Coleridge to John Thelwall, Covent Garden, 6 February 1797, in *The Collected Letters of Samuel Taylor Coleridge*, ed. Earl Leslie Griggs, 6 vols. (Oxford: Clarendon Press, 1956–71), 1:305–6, 305; Coleridge to Thelwall, Bristol, 13 May 1796, in *The Collected Letters*, 1:212–6, 216.

⁵William Wordsworth, *Lyrical Ballads, with Other Poems*, 2d edn., 2 vols. (London: T. N. Longman and O. Rees, 1800), 1:v–xlvi, v.

⁶Qtd. in E. J. Browne, *The Power of Place*, vol. 2 of *Charles Darwin: A Biography*, 2 vols. (New York: Knopf, 1995–2002), 2:472.

⁷Jackson, "Rhyme and Reason: Erasmus Darwin's Romanticism," *MLQ* 70, 2 (June 2009): 171–94.

⁸Catherine Packham, "The Science and Poetry of Animation: Personification, Analogy, and Erasmus Darwin's *Loves of the Plants*," *Romanticism* 10, 2 (2004): 191–207.

⁹Dahlia Porter, "Scientific Analogy and Literary Taxonomy in Erasmus Darwin's *Loves of the Plants*," *ERR* 18, 2 (April 2007): 213–21.

¹⁰Erasmus Darwin, *Zoonomia; or, The Laws of Organic Life*, 2 vols. (Dublin: printed for B. Dugdale, Dame-Street, 1800), 1:1. All subsequent references to Darwin's *Zoonomia* will be given parenthetically by volume and page number.

¹¹Dugald Stewart, *Elements of the Philosophy of the Human Mind*, 2d edn., vols. 2–4 of *The Collected Works*, ed. Sir William Hamilton (Edinburgh: Thomas W. Creech Constable; London: for T. Cadell Jun. and W. Davies, in the Strand, 1856), p. 313.

¹² *A Greek-English Lexicon: Compiled by Henry George Liddell and Robert Scott. Revised and Augmented throughout by Sir Henry Stuart Jones with the Assistance of Roderick McKenzie and with the CoOperation of Many Scholars, With a revised supplement* (New York: Oxford Univ. Press, 1996), s.v. “ἀναλογος.”

¹³ Sir William Hamilton, Bart., *Lectures on Metaphysics and Logic*, ed. H. L. Mansel and John Veitch, 4 vols. (Edinburgh and London: William Blackwood and Sons, 1859), 4:165–74.

¹⁴ Aristotle, *Posterior Analytics*, in *The Complete Works of Aristotle*, ed. Jonathan Barnes, rev. Oxford edn., Bollingen Series 71, 2 vols. (Princeton: Princeton Univ. Press, 1995), 1:114–66, 122 and 162.

¹⁵ For a discussion of Augustinian analogy of faith, see Victor Harris, “Allegory to Analogy in Interpretation of Scripture,” *PQ* 45, 1 (January 1966): 1–23. For a discussion of Thomas Aquinas’s ontology, see John F. Wippel, “Metaphysics,” in *The Cambridge Companion to Aquinas*, ed. Norman Kretzmann and Eleonore Stump, Cambridge Companions (New York: Cambridge Univ. Press, 1993), pp. 85–127.

¹⁶ Harris, p. 20.

¹⁷ As Joseph Butler puts this, “he who believes the Scripture to have proceeded from Him who is the Author of Nature, may well expect to find the same sort of Difficulties in it as are found in the Constitution of Nature” (*The Analogy of Religion, Natural and Revealed, to the Constitution and Course of Nature* [London: James, John, and Paul Kanpton, 1836], pp. iv–v.)

¹⁸ George Campbell, *The Philosophy of Rhetoric*, new edn., 2 vols. (Edinburgh: printed by George Ramsay and Co. for William Creech, Edinburgh, and T. Cadell and W. Davies, London, 1808), 1:167.

¹⁹ See Packham, pp. 198–9.

²⁰ Campbell, 1:123.

²¹ Campbell, 1:124.

²² *Ibid.*

²³ Geoffroy St. Hillaire, “Mémoires sur la Structure et les Usages de l’Appareil Olfactif dans les Poissons, Suivi de Considérations sur l’Olfaction des Animaux qui Odorent dans l’Air,” *Annales des Sciences Naturelles* 1, 6 (1825): 322–54, 341–2; Richard Owen, *On the Archetypes and Homologies of the Vertebrate Skeleton* (London: John Van Voorst, Paternoster Row, 1848), p. 5.

²⁴ The OED locates the first use of “similarity” in Henry Power’s *Experimental Philosophy* (1664) (OED, 2d edn., s.v. “similarity,” 1).

²⁵ [Peter Browne], *Things Divine and Supernatural Conceived by Analogy with Things Natural and Human* (London: printed for William Innys and Richard Manby, at the West-End of St. Paul’s, 1733), p. 2.

²⁶ Colin Jager, “Natural Designs: William Paley, Immanuel Kant, and the Power of Analogy,” chap. 4 of *The Book of God: Secularization and Design in the Romantic Era* (Philadelphia: Univ. of Pennsylvania Press, 2007), pp. 102–23. Jager observes that Paley pursues a more modest analogical project than the parallel between mundane and divine organization drawn in Butler’s *Analogy of Religion* (1736); rather than arguing the correspondence between nature and heaven, Paley emphasizes more limited analogies between the patterns of natural design and physical mechanism (pp. 111–3).

²⁷ M. H. Abrams, *The Mirror and the Lamp: Romantic Theory and Critical Tradition*, Norton Library (New York: W. W. Norton, 1958), p. 296.

²⁸ Earl R. Wasserman, *The Subtler Language: Critical Readings of Neoclassic and Romantic Poems*, Johns Hopkins Paperbacks (Baltimore: Johns Hopkins, 1968), p. 182.

²⁹ Jager finds within Wordsworth's *Prelude* a naturalized poetics that sits squarely within what might be termed this apologetics of analogy ("Wordsworth: The Shape of Analogy," chap. 6 of Jager, pp. 158–87).

³⁰ Stewart, 1:289 and 292.

³¹ David Hume, *A Treatise of Human Nature*, ed. L. A. Selby-Bigge (London: Henry Frende; New York: Macmillan, 1888), p. 209.

³² Hume, *Treatise*, pp. 142 and 147.

³³ Packham, p. 199.

³⁴ See Thomas Reid, *Inquiry into the Human Mind on the Principles of Common Sense*, 4th edn. (London: printed for T. Cadell in the Strand, London, and J. Bell and W. Creech, Edinburgh, 1785), p. 4; ECCO ESTC T109363; and Stewart, 1:54 and 424.

³⁵ Pierre Bourdieu states his case in the second chapter of his *Outline of a Theory of Practice*, trans. Richard Nice, Cambridge Studies in Social Anthropology 16 (New York: Cambridge Univ. Press, 1977), pp. 72–95. For Charles Taylor's formulation of "background" and "social imaginary," see Taylor, *Modern Social Imaginaries*, Public Planet Books (Durham NC and London: Duke Univ. Press, 2004), pp. 24–8. For a summary of the Heideggerian debt, see Taylor's essay "Overcoming Epistemology," in *Philosophical Arguments* (Cambridge MA and London: Harvard Univ. Press, 1995), pp. 1–19.

³⁶ For a brief summary, see Edward H. Madden, "Common Sense School," in *Routledge Encyclopedia of Philosophy*, ed. Edward Craig, 10 vols. (London and New York: Routledge, 1998), 2:446–8.

³⁷ Hume, *Treatise*, pp. 133–7.

³⁸ See Samuel C. Rickless's discussion of innatism in "Locke's Polemic against Nativism," in *The Cambridge Companion to Locke's "Essay concerning Human Understanding"*, ed. Lex Newman, Cambridge Companions (New York: Cambridge Univ. Press, 2007), pp. 33–66, 35–6.

³⁹ Edward Stillingfleet, *Origines Sacrae, or a Rational Account of the Grounds of Christian Faith, as to the Truth and Divine Authority of the Scriptures, and the Matters therein Contained* (London: printed by R. W. for Henry Mortlock, 1662), p. 383.

⁴⁰ See Edmund Burke's discussion of "Succession and Uniformity" in his *Philosophical Enquiry into the Origin of our Ideas of the Sublime and the Beautiful*, ed. Adam Phillips, Oxford World's Classics (Oxford and New York: Oxford Univ. Press, 1990), pp. 68–9.

⁴¹ Stewart, pp. 291–2.

⁴² Erasmus Darwin, *The Economy of Vegetation*, in *The Botanic Garden, a Poem. In Two Parts. Part I. Containing "The Economy of Vegetation." Part II. "The Loves of the Plants." With Philosophical Notes*, 4th edn. (London: printed for J. Johnson, St. Paul's Churchyard 1799), pp. 1–238, canto 1, lines 103–14. All subsequent references to Darwin's *Economy* will be cited parenthetically by line numbers.

⁴³Alexander Pope, *The Rape of the Lock*, in *The Norton Anthology of English Literature: The Major Authors*, ed. Abrams, 6th edn. (New York and London: W. W. Norton, 1996), pp. 1076–94, canto 1, lines 101–2.

⁴⁴Derek Attridge, *The Rhythms of English Poetry*, English Language Series 14 (New York: Longman, 1982), pp. 352–3.

⁴⁵This point was brought to my attention by my friend Cale Scheinbaum.

⁴⁶Advanced in Pierre Simon Laplace, *Exposition du système du Monde*, vol. 6 of *Oeuvres complètes de Laplace, publiées sous les auspices de L'Académie des Sciences, par Mm. Les Secrétaires perpetueles* (Paris: Gauthier-Villars, 1884). For a discussion in the context of evolution, see Stephen G. Brush, "The Nebular Hypothesis and the Evolutionary Worldview," *History of Science* 25, 69 (1987): 245–78. For discussion of Robert Chambers, see James A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of "Vestiges of the Natural History of Creation"* (Chicago: Univ. of Chicago Press, 2000), pp. 101–2.

⁴⁷Peter Hans Reill, "The Legacy of the 'Scientific Revolution': Science and the Enlightenment," in *Eighteenth-Century Science*, ed. Roy Porter, vol. 4 of *The Cambridge History of Science*, 8 vols. (New York: Cambridge Univ. Press, 2003), 4:23–43, 36 and 35–6.

⁴⁸Erasmus Darwin, *The Temple of Nature; or, The Origin of Society: A Poem, with Philosophical Notes* (London: Printed for J. Johnson, 1803).

⁴⁹Percy Bysshe Shelley, "From A Defence of Poetry," in *Romantic Poetry and Prose*, ed. Harold Bloom and Lionel Trilling, Oxford Anthology of English Literature (New York, London, and Toronto: Oxford Univ. Press, 1973), pp. 746–62, 742, and 762.

⁵⁰On James Clerk Maxwell's analogy, see Barri J. Gold, *ThermoPoetics: Energy in Victorian Literature and Science* (Cambridge MA: MIT Press, 2000), pp. 119–20. See Pietro Corsi, "Cuvier, Georges, and Jean-Baptiste de Lamarck" in *The Oxford Companion to the History of Modern Science*, ed. J. L. Heilbron (Oxford: Oxford Univ. Press, 2003), pp. 193–4. Richard Owen, *Lectures on the Comparative Anatomy and Physiology of the Invertebrate Animals, Deliverd at the Royal College of Surgeons, in 1843*, vol. 1 of *Hunterian Lectures*, 2 vols. (London: Longman, Brown, Green and Longmans, 1843–6). For a discussion of Edward Bulwer Lytton and George Eliot's engagement with analogy and their situation within Victorian comparative historiography, see Michael Carignan, "Analogical Reasoning in Victorian Historical Epistemology," *JHI* 64, 3 (July 2003): 445–64.

⁵¹Adrian Desmond and James Moore, *Darwin* (London: Michael Joseph, 1991), p. 229.

⁵²Olivia Judson, "An Original Confession," *New York Times*, 8 July 2008, Opinion Pages.