European Romantic Review

ISSN: 1050-9585 (Print) 1740-4657 (Online) Journal homepage: http://www.tandfonline.com/loi/gerr20

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To cite this article: Devin Griffiths (2018) The Distribution of Romantic Life in Erasmus Darwin's Later Works, European Romantic Review, 29:3, 309-319, DOI: 10.1080/10509585.2018.1465703

To link to this article: https://doi.org/10.1080/10509585.2018.1465703

Published online: 11 Jun 2018.

EUROPEAN ROMANTIC REVIEW
2018, VOL. 29, NO. 3, 309–319
https://doi.org/10.1080/10509585.2018.1465703

Routledge
Taylor & Francis Group

The Distribution of Romantic Life in Erasmus Darwin's Later Works

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ABSTRACT

This essay explores what Romantic theories of life offer to the environmental humanities and the problem of agency. It explores the turn in Erasmus Darwin's later works toward a distributed model of organic agency and against the commitment to epigenesis featured in *The Botanic Garden* (1789–91) and *Zoonomia* (1794). Taking up Darwin's discussion of elective affinity in *Phytologia* (1800), and its influence on Johann Wolfgang von Goethe's 1809 novel, *Die Verwandshaften*, I explore the implication of Darwin's analysis of the ontology of life for current debates over the distribution of agency and responsibility in the Anthropocene, with particular reference to Donna Haraway's "sympoeisis," Jane Bennett's material ecologies, and Bruno Latour's secular Gaia. Finally, the article explores how this distribution of organic agency conditions the poetics of *The Temple of Nature* (1803), and revises the cosmogony of Darwin's earlier poetry.

> Organic Life began beneath the waves.
>
> First HEAT, from chemic dissolution springs,
> And gives to matter its eccentric wings; …
> The ponderous atoms from the light divides,
> Approaching parts with quick embrace combines,
> Swells into spheres and lengthens into lines.
> Last, as fine goads with the gluten-threads excite,
> Cords grapple cords, and webs with webs unite.
>
> Erasmus Darwin, *The Temple of Nature* (lines 235–44)

Erasmus Darwin *is* Romantic life; his speculative and scientific writing about living systems had a profound influence on Romanticism and its central figures: Wordsworth, Coleridge, Shelley, and especially Goethe (King-Hele). Robert Richards has done as much as anyone to advance our understanding of Romantic philosophies of life and how they shaped later scientific thought. So it is curious that, in Richards's masterful longer study *The Romantic Conception of Life*, Darwin features only tangentially. I say curious, because Goethe, a central figure in Richards's study, was powerfully, profoundly influenced by his continued readings of Darwin's natural philosophy. Not only was his

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Metamorphoses der Pflantzen (1790) inspired by the formal conceit of Darwin's "Loves of the Plants," its central claim for the leaf as the basis of the *Ürpflantze* seems to have been drawn from both Darwin's *Botanic Garden* and *Zoonomia*.

At the end of the day, however, such connections matter less as markers of influence than as a way to underline their shared interest in vitalism and phenomena like elective affinity, and to ask what this tells us about Romantic models of distributed agency. Current environmental humanism, writing under the shadow of the Anthropocene, has begun an intensive study of new models of material agency, in the hope that new ways of thinking will help to understand and address the massive and massively distributed sources of global warming and environmental degradation. These include new ways to grasp the interaction between human and nonhuman assemblages (Haraway, *When Species Meet*; Haraway, *Staying with the Trouble*; Kohn; Tsing), a new politics of the environment (Bennett; Nixon; Heise), and new forms of solidarity (Spivak; Chakrabarty; Latour, *Facing Gaia*). If we are all responsible, and we are all in this together, the question is: how do we understand the distribution of that responsibility, the polity that "we" designates, and our collective ability to change course?

To put this differently, we are in search of a more ecological model of human and nonhuman agency, including a material vitalism that weighs the agency of nonhuman agents. The political theorist Jane Bennett, a central proponent of this new vitalism, argues for its significance as a new, more ecological model of assemblage. As she puts it,

> assemblage *is* an ecology in the sense that it is an interconnected series of parts, but it is not a fixed order of parts, for the order is always being reworked in accordance with a certain "freedom of choice" exercised by its actants. (original emphasis, 97)

This paper explores how Erasmus Darwin modeled just such a theory of assemblages operating at various material, vital, and poetic scales by studying the ontology of matter as a basis for reproduction and vitality. To see this, we have to pay more attention to his later works, *The Temple of Nature* (1800) and *Phytologia* (1803) which substantially revise the developmental accounts of his more famous works, *The Botanic Garden* (1789–91) and *Zoonomia* (1794). Darwin's increasingly distributed model of living systems eroded the Aristotelian framework he initially deployed in thinking about the nature of generation and vital interaction. These writings, particularly Darwin's speculations on the nature of reproduction, furnish a glimpse of what a *distributed ecology* might look like, a way of reimagining the *flexibility*, or "freedom of choice" produced by living systems. If we want to understand Romantic life, we have to study Erasmus Darwin.

At the same time, we need to take to heart Martin Priestman's judgment that most criticism fails to provide a "sustained account" of the importance of Darwin's poetics (5). We cannot ignore Darwin's verse *as* verse, isolating the scientific and speculative contributions from a verse style that is often characterized as outmoded and, at worst, stolid and uninventive. The following essay gives a closely-textured reading of the lines of Darwin's *Temple of Nature* given in the epigraph above, and I want to frame this, at the outset, as an attempt to grapple with the agency of Darwin's versification, the process of his form. If Darwin evolved toward a more distributed model of the agency of organic life, how did his poetics not simply reflect that shift, but help him to get there? Was prosody vital to that effort? If so, how did it act?

Part I: the vital impasse

My paper derives from a longstanding debate over the relation between Romantic theories of organicism and vitalism, beginning with discussions by figures like A. O. Lovejoy and René Wellek, and carried through the recent accounts of Denise Gigante, Sharon Ruston, Catherine Packham, and Robert Mitchell.[1] Packham, in particular, has analyzed how Darwin's "vitalist poetics" mark the culmination of a longer eighteenth-century debate over the relation between materialism, vitalism, and poetry (158). Though much recent criticism insists on their important distinctions, I see vitalism and organicism as determinatively aligned from the Romantic period on. They are consistently intertwined by key theorists, from Kant, to Claude Bernard, to Hans Driesch and Henri Bergson.[2] This makes sense if we understand organicism and vitalism, respectively, as the *integrity of structure* and *integrity of process*. They demand each other, as answers to the interlinked questions: where does organic form come from? And what does vitalism seek to produce and maintain?

My interest in these debates is a product of recent work in which I study Erasmus Darwin's formulation of evolution as an interscalar system that finds a common process of cosmic, stellar, and biological development at work throughout nature.[3] In Darwin's account, this widely shared process of development is driven by a central principle of seminal vitalism. Drawing on contemporary studies of embryology, botanical generation, and physiology, Darwin proposed a shared model for the reproduction and growth of all life. He consistently argued that all reproduction operates by means of an active male principle, and he extended it as a model for contemporary theories of nebular evolution and the formation of the earth.

My approach to Darwin here may seem idiosyncratic because, in broad strokes (and as I argue elsewhere), the theory of reproduction presented in his earlier works—*The Botanic Garden* and *Zoonomia*—is programmatic and deeply androcentric.[4] Arguing that a sensitive filament constituted the basis of the male contribution to reproduction, Darwin posited that this filament decisively selects, absorbs, and accretes nutritional matter furnished by the womb, egg, or floral body, metabolically determining the ultimate development and structure of the mature organism.[5] Theorizing that this living filament, which seeds new life, originates in the nervous system of the male parent, Darwin argued that its specific configuration in higher organisms was partly determined by the mental state of the male partner at the moment of conception, even going so far as to argue that it was this imaginative state (whether focused on the other partner, the self, or absent persons) that determined the sex of the child (1: 514–19). In this way, Darwin's reproductive theory (laid out fully in *Zoonomia*, but referenced in his discussion of both plant and animal fertilization in *The Botanic Garden*) recast procreation as an act of sexualized Romantic creation: an imaginative imposition of masculine form on feminine substance.

Yet in his later works, this notion of masculine form is radically undermined, as Darwin attempts to locate it within a wider framework for thinking about the ontology of nature. As he gave more careful consideration to the implications of embryogenesis and speciation, his effort to tease out the material implications of reproduction generated a far more distributed model of causality and agency than his epigenetic model allowed. Even in *Zoonomia*, there are hints of this new direction. For one, Darwin's theory of evolution, drawn from Linneaus, required that distinct species could produce successful

hybrids, not just sterile "mules" (1: 499, 1: 514). Such full hybridization implied that the female parent must have significant influence over the structure of the offspring (1: 513). This implied, as Darwin admitted, that the feminine component was not passive, but must consist of "ultimate particles" which could determine the structural development of the offspring. As he explained in *Zoonomia*,

> these ultimate particles of animal matter prepared by the glands of the mother may be supposed to resemble the similar ultimate particles, which were prepared for her own nourishment; that is, to the *ultimate particles of which her own organization consists*. (1: 513, my emphasis)

In the earliest stages of development of the embryo, these feminine "particles" help determinatively shape the ultimate form of that creature.

It is important to emphasize that this admission of spontaneous organic development contradicts Darwin's explicit rejection of spontaneous generation. After canvassing quickly the belief, advanced by Buffon and Joseph Needham, that reproduction consists of the assembly of "certain organic particles … supposed to exist in the spermatic fluids of both sexes, and … derived thither from every part of the body," Darwin produces several arguments for rejecting Buffon's theory out of hand (1: 491).[6] Darwin's theory of the sensitive filament, and the ministering agency of the nervous system in general, helped to solve the problem of structural determination by positing that the formal principle was centralized. Yet, as we have seen, that centralization was far from total. At the end of the day, it is hard to see what difference there is between what Darwin described as Buffon's "organic particles" and the "ultimate particles" of which, in Darwin's view, "organization consists."

Far from passive matter, the uterus, egg, or floral body contributes important structural information to offspring. Hence, the androcentric impulse of Darwin's theory of generation supervenes incompletely on the more even, interactive contribution of both male and female elements to the formation of young. *Zoonomia* implies a basic ontology of life that masculine form cannot overwrite, an ontology that admits the spontaneous volition of organic matter (whether derived from the female or male) to associate, interact, and assemble into more complex units.

This tension between spermatic form and a more general and vital principle of assembly plays out at multiple points in *Zoonomia*, but it takes a central place in later works like his *Phytologia* and *The Temple of Nature*. In fact, the problem of distributed vital agency is the precise context for Darwin's important discussion of "elective affinity"—the theory that chemical reactions are mediated by the mutual attraction or "affinity" of reagents. In *Phytologia*, Darwin returns to the problem of generation, placing sexual reproduction on a continuum with other modes of generation, including budding and parthenogenesis (93). This continuum is illuminated, he argues, by an understanding of the principles by which different kinds of matter are attracted to each other and bond in chemical reactions. "Some chemical combinations," Darwin explains, "may arise from the single attraction of one body, and the aptitude to be attracted of another"—which corresponds, essentially, to an understanding of the male element as active and the female as passive (213). Other chemical reactions, he continues, "may be owing to the reciprocal attractions of the two bodies, as in what is termed chemical double affinity" (213). Though such reactions occur between "unorganized or inanimate matter," Darwin argues that double affinity

may nevertheless "facilitate our conception of the adjunctions or concretions observable in organized or animated bodies" (213).

What are the implications of Darwin's analogy between double affinity and reproduction? As already noted, the fact that the female parent contributes structural information to the offspring suggests that she makes an active contribution; as Darwin puts it, "both the combining and combined particles are endued with vitality" (114). He concludes, "whether vegetable or animal, both the fibrils with formative appetencies, and the molecules with formative propensities, *reciprocally stimulate and embrace each other, and instantly coalesce*, and may thus popularly be compared to the double affinities of chemistry" (114, my emphasis).

This "double affinity" gave Darwin a way to explain how the male and female parent might contribute equally to the formation of their young. It also prompted a radical new conception of the distributed agency of matter, one that could tie together the behavior of chemical, biological, and sexual agents. In place of the seminal vitalism of Darwin's earlier works, affinity offered a new theory of general attraction that operated across the various scales of nature. As Darwin put it, as part of his discussion of sexual union,

> The attraction of all matter to the centres of the planets, or of the sun, is termed gravitation; that of particular bodies to each other is generally called chemical affinity; to which the attractions belonging to electricity and magnetism appear to be allied. (114)

Though not previously noted, it is highly likely that Darwin's discussion of double elective affinity in *Phytologia* was a key source for Goethe's 1809 novel, *Die Wahlverwandshaften* (*Elective Affinities*). Though Goethe does not mention *Phytologia* in his papers, Darwin's study was immediately translated into German as *Phytonomie oder philosophische und physische Grundsätze des Acker- und Gartenbaues*, and given Goethe's long interest in both botany and Darwin's other works, it is hard to imagine he would have overlooked Darwin's most important study of plant life. Goethe's novel famously uses elective affinity to explain the reshuffling of two sets of relationships, as the members of a married couple, Eduard and Charlotte, fall in love with new lovers, Ottilie and the Captain. Jeremy Adler has given the most extensive attention to Goethe's scientific sources, and notes Goethe was studying single chemical affinity as early as 1796 (268). Yet Adler finds Goethe's focus on double affinity harder to account for, and, especially, the novel's argument that "'affinity' might be broadened further still to include not just natural but human relations" (269). Moreover, Adler notes that this generalization is marked by Goethe's use of *Anziehungskraft*—"a standard eighteenth-century term for 'attraction' or 'attractive force'" (272). Ultimately, the constellation of interests in Goethe's *Elective Affinities* retraces Darwin's use of chemical affinity as a general theory of attraction that applied to sexual life. It also helps to explain one of the most inexplicable features of Goethe's novel—the fact that the child of Eduard and Charlotte looks instead like Ottilie and the Captain. This is evidently the result of imaginative distraction: when Eduard and Charlotte conceived the child, we are told they had their absent lovers in mind. Eduard underlines this point when he complains that the union, though strictly legal, was psychic adultery. As I previously noted, Darwin had argued in *Zoonomia* that the sex and physical appearance of the child were determined by the imagination of the male partner. Goethe updates this theory of imaginative formation in light of double elective affinity, giving each partner's imagination an equally formative influence on the child.

In a famous essay, Walter Benjamin argued that Goethe's novel illustrates the immanence of mythic truth within mundane experience,[7] and it is tempting to suggest that this *aufhebung* derives, in a longer view, from Darwin's argument that the transition from single to double affinity demonstrates the elevation of a one-sided, animal desire into higher and shared union, the difference between, as he puts it, the "passions of hunger and love" (*Phytologia* 127). But ultimately, Darwin and Goethe's mutual interest in elective affinity is more intriguing than the tendentious question of their mutual influence, or the continued territorial disputes between British and German Romanticism. Amanda Jo Goldstein has recently explored the importance of epigenesis to Romantic materialism as a way to interpret the "configuration" of body and world within his vitalism, the way that subject and environment shape or "figure" each other in time (57). Yet a longer view of Darwin's career shows his increasing sensitivity to the limitations of epigenetic thinking, and his various efforts to overcome its insularity. Epigenesis names the sequential development of the individual body in coordination with its material world—its *autopoiesis*. Double affinity, by contrast, offered a Romantic model for what Donna Haraway has recently termed *sympoiesis*—a "making with" that explains how living bodies constitute each other, both immediately and through the wider distributions of their environments (*Staying with the Trouble* 5, 33).[8] In assembling these passages, I am trying to focus our attention on Darwin's own increasing attraction to an ontology of vital life that was far more distributed than his androcentric commitments to epigenetics allowed. To put it differently, in such passages, Darwin refashions and flattens the formal ontology of epigenesis, extending formal agency to all constituents, and so formulates a theory of distributed natural agency. In such a vision, organic form emerges from a collaborative and networked engagement of organic particles, rather than a determinative imposition of form.

Read this way, Darwin's vision resonates with recent ecocritical efforts to register the vital distributions of nature. Jane Bennett imagines a world in which "The source of effects is … an ontologically diverse assemblage of energies and bodies, of simple and complex bodies, of the physical and the physiological. … Everything is, in a sense, alive" (117). And, in a recognizably Darwinian formulation, Haraway proposes that "Perhaps as sensual molecular curiosity and definitely as insatiable as hunger, irresistible attraction toward enfolding each other is the vital motor of living and dying on earth" (*Staying with the Trouble* 58). As reworked in light of elective and double affinity, Darwin suggests that the agency of living systems is distributed at all levels of physical, temporal, and ontological scale. These later discussions of material agency are, in Bennett's sense, profoundly ecological: "an interconnected series of parts" that is not fixed, but instead "reworked in accordance with a certain 'freedom of choice' exercised by its actants" (97). In such moments, Darwin brushes into a rich model for the agency of ecologies.

The problem of the Anthropocene, put simply, is that freedom of choice leads to disaster, insofar as everyone with the capacity tends to maximize their energetic footprint, at the expense of the larger world and of the majority of other beings who inhabit it. As Bruno Latour has recently put it, "How can we simultaneously be part of such a long history, have such an important influence, and yet be so late in realizing what has happened and so utterly impotent in our attempts to fix it?" ("Agency at the Time of the Anthropocene" 1). In the tragedy of the commons, distributed freedom leads, with terrible irony, to determinism.

Part II: distributed versification

In the remainder of this essay, I want to consider how this distribution works through Darwin's verse. Bennett's search for a model of more distributed agency seeks another way to understand freedom by loosening its strict attachment to the human agent. One counter-intuitive way to do this, Bennett proposes, is through strategic anthropomorphism: ascribing human-like motivations to nonhuman things (99). Such a strategy tracks closely Catherine Packham's account of personification in Darwin's poetics. As Packham puts it, "For Darwin, personification … is valued not because it presents what is not in existence, but because it allows a meditation on what existence could be conjectured to be" (157–58).

Let us run this account through those lines from *The Temple of Nature*, published posthumously a few years after *Phytologia*:

> First Heat, from chemic dissolution springs,
> And gives to matter its eccentric wings;
> […]
> The ponderous atoms from the light divides,
> Approaching parts with quick embrace combines,
> Swells into spheres and lengthens into lines.
> Last, as fine goads with the gluten-threads excite,
> Cords grapple cords, and webs with webs unite. (1: 234–44)

If we adopt the perspective of Bennett and Packham, the personification of "Heat" allows the reader to grasp, via human experience, the agentic behavior of natural forces. And yet, given the action of Heat's solitary, sovereign, and seemingly ineluctable syntax, I am not sure how this helps get at the kind of assemblage Bennett is looking for: one that emphasizes flexibility, freedom of choice, and a different way of seeing agency and its distribution. It is hard to see how those atoms retain any "freedom of choice" as they are "divided" by heat. I think this is a more general problem of Bennett's account, especially insofar as it tries to map models of living agency onto non-living things. Here we find also the formal dimensions of the problem of agency, the struggle to express distributed agency in a language, like English, whose syntax produces strong distinctions between subject and object, between action and reception.

One possible solution is given in anthropologist Paul Kockelman's recent analysis of distributed agency. Kockelman argues that all actions are inherently distributed across the various agentive and material actors required to bring about an event. A crucial dimension of agency, Kockelman points out, is flexibility or freedom of choice. When it comes, for instance, to questions of guilt or innocence, we do not usually ascribe agency to an actor unless they evidently had a choice. And we usually judge such agency in terms of the breadth of the actor's ability to do different things, their capacity to enlist other agents in that purpose. But understood as a distributed model agency is, as he puts it, an "agentive precipitate"—an effect of the complex interaction between multiple actors (27). Kockelman's key example is an ecosystem, in which various kinds of prey and predators interact. Each individual creature can be conceived as an actor. But groups of actors —for instance, all the herbivores in an ecosystem—have a kind of collective agency, too, which is distinct from their individual contributions. So too, he argues, might we find a collective agency composed of both the predator and its prey, with respect to their

impact on the larger ecosystem, insofar as their interaction shapes the environment in ways for which neither is exclusively responsible. Such agentive precipitates overlap in complex ways, and, I would note, are undergirded by uneven distributions of power, uneven flows of energy and materials. The important point is that flexibility evaluates not so much freedom of choice, in this account, but the complexity and richness of possible outcomes. The more actors you have, the more possible paths they might, collectively, take.

We might also recognize global warming as a precipitate of various actions, atmospheric elements, and energetic systems, and a central problematic for distributed agency and the interaction between vastly different levels of scale. Kockelman's description of agency can help, by filling in and fleshing out Bennett's model of assemblage, showing why collective or distributed agencies are different not only in degree but in kind. Having more and more diverse agents demands a model of agency that moves beyond anthropomorphism.

Here is where I think that passage from *The Temple of Nature* gets interesting. The syntax makes it clear that Heat gives wings to matter, divides atoms, combines parts, swells and lengthens their components. But, focusing on the final statement, how do we distinguish the subject and object of what "grapples" and "unites"? The pluralization and then twinning of subject and object (cords/cords, webs/webs) hashes the unitary agency of normative English sentence structure, generating a reflexive sense in which all of these actions are distributed, reflexive, and mutually contingent. Moreover, that adverbial phrase, "as fine goads," further divides the predication, producing a predicate that is shared across two events (as one thing happens, so does another). Neither action drives the other; rather they precipitate in a moment of seemingly mutual action and possible influence.

Finally, I want to call attention to the fact that these lines substantively rewrite perhaps the most famous passage from Darwin's *Botanic Garden*, in which he presents a similarly speculative cosmology:

> "Let there be light!" proclaim'd the Almighty Lord,
> Astonished Chaos heard the potent word;
> Through all his realms the kindling Ether runs,
> And the mass starts into a million suns;
> Earths round each sun with quick explosions burst,
> And second planets issue from the first;
> Bend, as they journey with projectile force,
> In bright ellipses their reluctant course;
> Orbs wheel in orbs, round centres centres roll,
> And form, self-balanced, one revolving whole. (*Collected Writings* 1, 1: 103–13)

In response to God's command, "Let there be Light," the cosmos whirls into action. Stars burst into flame, eject planets, which then eject their moons, and all settles into an order in which, Darwin concludes, "Orbs wheel in orbs, round centres centres roll, / And form, self-balanced, one revolving whole" (1: 111–12). In that earlier account, the planets settle into a "self-balanced" system governed by the ministrations of Newtonian law. Planets do not elect to obey the laws of gravity any more than atoms might choose to dissolve under applied heat.

In my previous writing on that passage, I have explored how it recapitulates Darwin's seminal vitalism at cosmic scale ("The Intuitions of Analogy in Erasmus Darwin's Poetics" 656–61; *The Age of Analogy* 63–64). But in substantively revising these lines in *The Temple of Nature* and translating his cosmogony from a Newtonian to an organic system, in which "cords grapple cords, and webs with webs unite," Darwin uses the syntactic doubling of intervolved iamb to write the agentive distribution of elective affinity into the texture of organic interrelation. Such distributed versification generates a vital interaction at odds with unilateral agency. A strict pentameter requires the demotion of the stress in "grapple" to generate the initial inversion that would normalize this line. Yet grapple resists, offering the hint of a sixth beat that slows and stresses the line. If, for instance, we were to try other possible predicates—unite, embrace, gather—virtually any would place less stress on the initial feet. Grapple implies a strong, reciprocated, muscular interaction, a tense engagement that refuses the overmastery of one by another, much as it refuses the overmastery of the iambic pentameter. Such a prosody produces, to my ear, an experience of poetic vitality that insists upon the liveliness of language and the distributed powers of living systems.

The distributed syntax here both makes questions of agency harder to answer and enforces a sense that agency is a fuzzy thing—a smearing of action and responsibility across multiple possible agonists. In such moments, prose and poet precipitate as a collective agent that confuses central features of our account of authorship and human action. This emphasizes Kockelman's point: "flexibility" in such cases accrues not in the option to choose between different possible actions, or different dispositions of verse, but rather in the openness and unpredictability—of timing, effect, and path—that is produced when you have a complicated stew of semantic, syntactic, and accentual actors. To put it differently, such poetic structures indicate that agency has always been weird, and that it is only the powerful stabilizing forms we have evolved—iambic verse, normative subject/predicate relations—that have sometimes made these complexities easier to overlook.

Theories of Romantic life have risen to prominence in a range of fields today because they offer the promise of rethinking the nature of living systems and planetary ecologies. They also offer alternatives to the presumption, whether by way of theology, Gaia, or a more organic ecology, that the earth is self-healing. My point is that, in such moments, Darwin's sexual logic devolves into something more exciting, through verses that distribute agency and control, the distinction between formal impulse and matter, into a much wider, more sociable, and more distributed network of interaction, relation, and assembly.

Notes

1. Lovejoy considered vitalism and its connection to Romanticism and organicism in a string of early articles. See "The Meaning of Vitalism"; "The Import of Vitalism"; "The Meaning of Driesch and the Meaning of Vitalism." This interest in vitalism was driven by a running debate with the biologist H. S. Jennings (see Russell). See also Ruston, Gigante, Packham, amd Mitchell.
2. For a discussion of these later vitalists, see Mitchell.
3. See Griffiths, *The Age of Analogy*.

4. I give a more extended analysis of Darwin's investment in epigenesis, and how it contributed to a "Darwinian imagination" shared with his grandson, in a forthcoming article, "The Fertile Darwins."
5. Darwin, *Zoonomia* 1: 480–94. All further references are given parenthetically by volume and page number.
6. First, he argues that this is "analogous to no known animal laws." And second, it does not explain the need for a male partner in fertilization; if the organic particles are derived from all of the parts of the body and are able to spontaneously self-assemble, Darwin argues, "there is no reason why the mother should not produce a female embryon without the assistance of the male" (1: 491–92). Finally, such a theory of matter seems to imply that, insofar as organisms grow and sustain themselves by feeding on others, that in associating with these other organic particles, those organisms should take on some of the structural features that those particles encode—perhaps transforming into them. Under such a theory, "mankind would soon resemble by their theory the animals, which they feed upon" (1: 465).
7. See Leacock.
8. Haraway credits M. Beth Dempster with coining the term "sympoiesis" (Haraway, *Staying with the Trouble* 33).

References

Adler, Jeremy. "Goethe's Use of Chemical Theory in His *Elective Affinities*." *Romanticism and the Sciences*. Ed. Andrew Cunningham and Nicholas Jardine. Cambridge: Cambridge UP, 1990. 263–79. Print.

Bennett, Jane. *Vibrant Matter: A Political Ecology of Things*. Durham: Duke UP, 2010. Print.

Chakrabarty, Dipesh. "The Climate of History: Four Theses." *Critical Inquiry* 35.2 (2009): 197–222. *University of Chicago Press Journals*. Web. 10 Mar. 2015.

Darwin, Erasmus. *The Collected Writings of Erasmus Darwin*. Ed. Martin Priestman. London: Thoemmes Continuum, 2004. Print.

——. *Phytologia, or, the Philosophy of Agriculture and Gardening with the Theory of Draining Morasses*. J. Johnson, 1800. Print.

——. *The Temple of Nature, or the Origin of Society*. J. Johnson, 1803. Print.

——. *Zoonomia; or, the Laws of Organic Life*. Vol. 1. J. Johnson, 1794. Print.

Gigante, Denise. *Life: Organic Form and Romanticism*. New Haven: Yale UP, 2009. Print.

Goldstein, Amanda Jo. *Sweet Science: Romantic Materialism and the New Logics of Life*. Chicago: U of Chicago P, 2017. Print.

Griffiths, Devin. *The Age of Analogy: Science and Literature Between the Darwins*. Baltimore: Johns Hopkins UP, 2016. Print.

——. "The Fertile Darwins: Epigenesis, Organicism, and the Problem of Inheritance." *RaVoN* 67 (2018), forthcoming. Web.

——. "The Intuitions of Analogy in Erasmus Darwin's Poetics." *SEL: Studies in English Literature 1500-1900* 51.3 (2011): 645–65. *ProjectMuse*. Web. 6 May 2016.

Haraway, Donna. *Staying with the Trouble: Making Kin in the Chthulucene*. Durham: Duke UP, 2016. Print.

——. *When Species Meet*. Minneapolis: U of Minnesota P, 2008. Print.

Heise, Ursula K. *Imagining Extinction: The Cultural Meanings of Endangered Species*. Chicago: U of Chicago P, 2016. Print.

King-Hele, Desmond. *Erasmus Darwin and the Romantic Poets*. Bedford: St. Martin's, 1986. Print.

Kockelman, Paul. "Semiotic Agency." *Distributed Agency*. Ed. N. J. Enfield and Paul Kockelman. Oxford: Oxford UP, 2017. 25–38. Print.

Kohn, Eduardo. *How Forests Think: Toward an Anthropology Beyond the Human*. Berkeley: U of California P, 2013.

Latour, Bruno. "Agency at the Time of the Anthropocene." *New Literary History* 45.1 (2014): 1–18. *ProjectMuse*. Web. 13 Jun. 2017.

——. *Facing Gaia: Eight Lectures on the New Climatic Regime*. Cambridge: Polity, 2017. Print.
Leacock, N. K. "Character, Silence, and the Novel: Walter Benjamin on Goethe's *Elective Affinities*." *Narrative* 10.3 (2002): 277–306. *JSTOR*. Web. 17 Jul. 2017.
Lovejoy, Arthur O. *Bergson and Romantic Evolutionism*. Berkeley: U of California P, 1913. Print.
——. "The Import of Vitalism." *Science* 34.864 (1911): 75–80. *JSTOR*. Web. 10 Jul. 2017.
——. "The Meaning of Driesch and the Meaning of Vitalism." *Science* 36.933 (1912): 672–75. *JSTOR*. Web. 10 Jul. 2017.
——. "The Meaning of Vitalism." *Science* 33.851 (1911): 610–14. *JSTOR*. Web. 10 Jul. 2017.
Mitchell, Robert. *Experimental Life: Vitalism in Romantic Science and Literature*. Baltimore: Johns Hopkins UP, 2014. Print.
Nixon, Rob. *Slow Violence and the Environmentalism of the Poor*. Cambridge: Harvard UP, 2011. Print.
Packham, Catherine. *Eighteenth-Century Vitalism: Bodies, Culture, Politics*. Basingstoke: Palgrave Macmillan, 2012. Print.
Priestman, Martin. *The Poetry of Erasmus Darwin: Enlightened Spaces, Romantic Times*. Aldershot: Ashgate, 2013. Print.
Richards, Robert J. *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe*. Chicago: U of Chicago P, 2002. Print.
Russell, D. "Toward a Pragmatist Epistemology: Arthur O. Lovejoy's and H. S. Jennings's Biophilosophical Responses to Neovitalism, 1909-1914." *Journal of the History of Biology* 48.1 (2015): 37–66. *EBSCOhost*. Web. 7 Jul. 2017.
Ruston, Sharon. *Shelley and Vitality*. Basingstoke: Palgrave Macmillan, 2005. Print.
Spivak, Gayatri Chakravorty. *Death of a Discipline*. New York: Columbia UP, 2003. Print.
Tsing, Anna Lowenhaupt. *The Mushroom at the End of the World: On the Possibility of Life in Capitalist Ruins*. Princeton: Princeton UP, 2017. Print.
Wellek, René. "The Concept of 'Romanticism' in Literary History II. The Unity of European Romanticism." *Comparative Literature* 1.2 (1949): 147–72. *JSTOR*. Web. 10 Jul. 2017.