The Monster in the Rainbow: Keats and the Science of Life

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At Benjamin Haydon’s “Immortal Dinner” party of 28 December 1817, Keats agreed with Charles Lamb that Newton “had destroyed all the poetry of the rainbow, by reducing it to the prismatic colors” (Haydon 231).1 At about the same time, the physiologist John Abernethy (1764–1831), whom Keats knew from his medical training at Guy’s Hospital in London, was claiming that materialist practitioners of the “science of life” were destroying all the poetry of the living organism by reducing it to the sum of its functions. Just as the physical sciences had eliminated the life of the rainbow, in other words, radical physiologists, such as Abernethy’s rival William Lawrence (1783–1867), were threatening to dissolve the mystery of life itself. Scientific discourse between 1780 and 1830 was preoccupied with the idea of a “living principle” that distinguished living matter from nonliving. The focal point for the dispute between Abernethy and Lawrence over this possibility of a supervenient vital principle was the work of the British physiologist John Hunter (1728–93). Although Hunter was not the first to renounce the mechanical application of Newtonian principles to the living organism, he lent the weight of extensive empirical experimentation to the idea that life was something superadded to—or in excess of—physical organization.2 Against the materialism represented by Lawrence, vitalists in the wake of Hunter sought to define the science of life beyond the mechanistic sphere of Newtonian science that had dominated the physiology of the first half of the eighteenth century.3 The paradox, which Keats brilliantly brings to light in Lamia (the site of his famous attack on the Newtonian tendency to “[u]nweave a rainbow” [Complete Poems 342–59; 2.237]), is that the same philosophy that would reduce life to the sum of its bodily functions helped to generate a countertheory of life as excess. The theory of a
self-propagating vital power, which could extend beyond the physical borders of the organism, found creative expression in the various guises of Romantic monstrosity: a radically new aesthetic that emerged from the natural philosophy of the late eighteenth and early nineteenth centuries.

The aesthetic definition of monstrosity changed significantly during this period, from an Enlightenment concept of defect or deformity to a Romantic notion of monstrosity as too much life. Hunter, whose notion of a living principle was at the source of the controversy between Abernethy and Lawrence, posited an even more speculative “principle of monstrosity” (Essays 240), which held that rather than something gone awry during formation, monstrosity was the result of the formative capacity. Hunter’s principle of monstrosity was nothing other than the principle of life propagating itself to excess from within. This concept of a self-propagating vital power, developed in physiological discourse of the late eighteenth century, had its equivalent in the natural philosophy of early German Romanticism, where it was discussed by Johann Friedrich Blumenbach in 1780 as a “formative force” (Bildungsrieb), or nisus formativus. It was subsequently imported into Romantic aesthetics by way of Kant’s third critique, where the Hunterian-Blumenbachian notion of what Kant calls a “self-propagating formative power” informs his aesthetic definition of monstrosity as that which exceeds representation (2: 22). Kant blends natural philosophy with aesthetics to articulate the emergent concept of Romantic monstrosity. Such monstrosity does not remain on the level of theory but becomes the motivation for a new kind of monster in the literature of the Romantic period, one whose life force is too big for the feeble frame of the ostensible hero.

In the early-nineteenth-century debate over the controversial principle of life, Lawrence asserted against Abernethy that “[a]n immaterial and spiritual being could not have been discovered amid the blood and filth of the dissecting-room” (Lectures 18). Yet this is the space that Romantic writers used as their mental workshop of filthy creation. As Mary Shelley records in her 1831 introduction to Frankenstein, a single evening’s conversation at Villa Diodati in June 1816 over the so-called principle of life prompted two of the period’s most famous monsters: Frankenstein’s creature and the Byronic vampire. Coleridge, who wrote his Theory of Life (Shorter Works 485–557) in response to Lawrence in the final months of 1816, portrays the climactic scene of The Rime of the Ancyent Marinere as an encounter with monsters of the deep. And Keats answers Newton with his “rainbow-sided” monster Lamia (1.54). Whether we consider Shelley’s creature of perverted physiology, the Byronic vampire, Coleridge’s “water-snakes” (Rime, line 265), or Keats’s vivified rainbow, the contemporary scientific concern that life could propagate itself was the condition of possibility for Romantic monstrosity.

In what follows, I sketch the theoretical background for the kind of monstrosity Keats brings to life in Lamia and then suggest how such monstrosity answers the Romantic, and particularly Keatsian, concern with what it means to be born—or to die—into life. Keats’s fragmentary epic Hyperion (Complete Poems 248–69), composed in the final months of 1818, notoriously breaks off at the moment when the ascendant poet-hero, the golden boy Apollo, is about to “[d]ie into life” (3.130). Lamia and The Fall of Hyperion (Complete Poems 361–73), written contemporaneously from July through September 1819, respond to that abyss of the unknown, the unwritten mystery of “life” at the end of Hyperion. But whereas The Fall of Hyperion portrays the heavy physicality of bodies barely able to sustain life, Lamia portrays an excessive vitality that is finally too much for the feeble frame of the ostensible hero, Lycius. When Lamia vanishes with a “frightful scream” at the end of the poem, “Lycius’ arms were empty of delight, / As were his limbs of life, from that same night” (2.306–08). Viewed in this light, Lamia is no mere narrative swerve from Keats’s epic ambi-
tions; rather, it is an overexuberant response to the problem of life posed at the end of the first *Hyperion* and worked through, to opposite effect, in the second. Lamia represents the consummate Romantic monster, a vision of life conceived beyond the material fact of organization.

When Keats conceived his rainbow-sided monster in the summer of 1819, the debate between Abernethy and Lawrence over the principle of life had reached its peak. In a series of public lectures at the Royal College of Surgeons between 1814 and 1819, Abernethy proposed, and his onetime student Lawrence denied, that what Hunter had called *materia vitae diffusa* was nothing other than an invisible vital fluid, which was the source, or the “principle,” of life (Abernethy 32). When Abernethy claimed in his opening lecture, *Enquiry into the Probability and Rationality of Mr. Hunter’s Theory of Life* (1814), that “a subtil substance of a quickly and powerfully mobile nature, seems to pervade every thing, and appears to be the life of the world; and therefore it is probable that a similar substance pervades organized bodies, and produces similar effects in them” (51). In March 1816, Lawrence responded with *An Introduction to Comparative Anatomy and Physiology*, denying the presence of a supervenient vital fluid and insisting that life was simply a matter of organization, or “the assemblage of all the functions” (120). Unlike more strictly mechanistic models of human physiology—which saw life as “an assemblage of pipes, canals, levers, pulleys, and other mechanism,” as Lawrence put it (speaking of the school of Hermann Boerhaave)—Lawrence’s brand of materialism drew a distinction between life as an assemblage of functions and life as an assemblage of parts (*Lectures* 67). According to Lawrence, the latter would be the study of anatomy, rather than physiology, since it could not account for certain vital phenomena present only in living bodies. Unlike his more radical French counterparts, Lawrence recognized that after the mid-century discovery of sensibility and irritability by Albrecht von Haller, it was no longer possible to embrace uncritically a mechanistic Newtonian physiology. His definition of life as an “assemblage of all the functions” was thus a materialist, not a mechanistic, theory of life. The distinction is significant, for the new vitalist monstrosity that sprang forth against it would not have been possible in the mechanistic world of Newton.

In a series of papers published throughout the 1770s, Hunter defined the methods and techniques of modern physiology, grounding them on the central assumption that “[w]hatever Life is, it most certainly does not depend upon the structure or organization” (*Essays* 114). Instead, Hunter believed that life was the result of a supervenient, and moreover formative, power. As Abernethy put it, “Hunter was the first who deduced the opinion, as a legitimate consequence of legitimate facts, that life actually constructed the very means by which it carried on its various processes” (*Hunterian Oration* 42). This Hunterian notion of a self-propagating vital power, which could assert itself beyond the physical border of the organism, effectively enabled the transformation of an Enlightenment concept of monstrosity as an ill assemblage of parts into a vitalist concept of monstrosity as an extension of the living principle.

Hunter’s study of monsters in the three divisions of mineral, vegetable, and animal matter contains the logic for understanding this swerve from an established notion of monstrosity as defect or deformity to a Romantic view of monstrosity as a troubling overflow of the living principle. Hunter’s observations on monsters (*Essays* 239–51), published with his posthumous papers in 1861, set out from the prior understanding of monstrosity as malformation: “Nature being pretty constant in the kind and number of the different parts peculiar to each species of animal, and also in the situation, formation, and construction of such parts, we call *everything that deviates*...
from that uniformity a 'monster'; whether [it occur in] crystallization, vegetation, or animalization" (239; my emphasis). Monstrosity was predicated on a deviation from uniformity, just as beauty had been predicated throughout the eighteenth century on "Uniformity amidst variety" (Hutcheson 11). In his 1814 lectures on aesthetics, Coleridge writes, "The beautiful [. . .] is that in which the many, still seen as many, becomes one" (Shorter Works 371). He calls the result "multeity in Unity," and two years later in his Theory of Life he defines life similarly (but with a difference) as "the power which discloses itself from within as a principle of unity in the many," or "the principle of unity in multeity" (510). Just as beauty had been conceived as a static harmony of parts, life becomes conceived as a principle of harmony among parts. And monstrosity emerges as a principle opposed to their harmonious convergence in form.

Whereas the Enlightenment conceived monstrosity as a static, ill assemblage of parts—in other words, according to a mechanistic Newtonian physiology—Hunter paves the way for a Romantic rethinking of monstrosity as an extension of the living principle. He observes that "every animal is formed from a portion of animal matter endowed with life and actions, being [. . .] so arranged in itself as only to require new matter for it to expand itself according to the principle inherent in itself." Rather than a deviation from uniformity, monstrosity now came to represent more of—indeed, too much of—the same. Hunter's principle of monstrosity was nothing other than the power of the animal to continue propagating itself or of its "first arrangements to go on expanding the animal according to the first principles arising out of them" (Essays 239–40). This is not to say that Hunter completely dismisses the former concept of monstrosity as an irregular assemblage of parts. But he observes that "[a] deficiency and a mal-conformation are much more easily conceived than the formation of an additional part" (244). And it is to the latter, unthinkable kind of monstrosity that he devotes most of his attention.

To illustrate, Hunter considers first monsters of the mineral category. In the case of a crystal, he argues, a defect occurring immediately before or after formation begins can cause the mineral to propagate itself incorrectly. Having set off on the wrong foot, that is, the mineral continues on the road of monstrous generation through a repetition of its aberrational self-production, "the first setting out being wrong, and [the formation] going on in the same [wrong line]." One can see how Hunter's principle of monstrosity is well served when mineral formation, whereby the crystal turns itself into a monster by producing more of itself, is applied to vegetable and animal life, whose self-production is more heterogeneous. Indeed, he proposes that vegetables also consist "only of two parts, the old and the new; the one only a repetition of the other." Vegetable monsters result no longer from a botched arrangement of parts but from an unrestrained and misdirected power of increase. The vegetable need merely extend itself by repetition to qualify as a monster, for by this process "the vegetable works up itself." The Hunterian vegetable is a frothing, uncontainable self-construct, forever in danger of producing new monsters. In fact, vegetables contain the greatest number of monstrosities "because a vegetable can, and is always producing new parts." Thus, "[i]f a natural branch decayed, or was destroyed, two or three shall arise in its place, all of which are so many monsters" (241–43). In place of the one decayed part, the vegetable threatens a monstrous multiplicity, becoming the parent stock of "so many monsters." The fear is not that the missing part will reproduce itself but that it will reproduce itself to excess, that the living principle in the plant will take advantage of the momentary gap in its substance and break through with a formative vengeance.

If vegetables, like crystals, consist of only two parts—the old and the new, the former repeating itself into the latter—animals are indisputably organized beings. Yet, just as a missing branch opens the possibility of any number of
monstrous reproductions, certain animal parts when removed can “form monsters in these parts.” As an example, Hunter mentions “a lizard, which, having lost its tail, has the power of generating a new one [. . .] in such we often find a double tail, arising from the broken part” (245). Here, as in vegetable matter, Hunter’s principle of monstrosity asserts itself as the power of regeneration. In the Romantic debate over the principle of life, Lawrence declared that “[t]he Power of reproduction—of restoring or renewing parts, that have been mutilated or entirely lost, is one of the most striking charac-
ters of organized bodies” (Introduction 14). Cole-
ridge uses the term reproduction similarly in his Theory of Life to indicate the “growth and iden-
tity of the whole, amid the change or flux of all the parts” (Shorter Works 526). And for Blum-
menbach (a major influence on Kant and a means by which he absorbed Hunter’s vitalist physiol-
ogy), reproduction means “the replacing of mu-
tilated parts” (Institutions 355). Reproduction, in the world of post-Newtonian physiology, is largely self-production, and “what qualities are to chemistry, productiveness is to the science of Life” (Coleridge, Shorter Works 519). Not only does Hunter anticipate Romantic Naturphiloso-
phie by representing vegetable and animal life as parallel processes in a single realm, but his no-
tion of a self-propagating living principle under-
writes the Romantic aesthetics of monstrosity.

Viewing early forms of animal life as anal-
ogous to, if not continuous with, vegetable life allows Hunter to theorize even animal mon-
strosity as a principle whereby the creature makes more of itself. He observes that most ani-
mal monstrosities occur before birth, when the creature resembles vegetable life more closely than it does its species of animal life after birth, and seeks to “inquire in what respect is an ani-
mal, some time before birth, similar to a veg-
etable, or to the parts of animals which have the power of regeneration after birth.” His answer is that “the principle of life [before birth] comes much nearer to vegetation, and most probably

the further back we go, this similitude is the stronger” (243). If the earliest forms of animal life, like vegetable life, consist of only two parts, then the animal’s principle of monstrosity can also be defined as a kind of self-repetition. Just as vegetable monstrosities arise from ag-
gregations, extensions, and a multiplication of parts, animal monstrosities occur when the liv-
ing principle fails to stay within the formal bounds of the organism. Monstrosity, as Hunter
describes it, in animals and vegetables—in all that contain the living principle—is the result of too much life. This is a revised, vitalist concept of monstrosity, according to which monsters are no longer mechanical malformations. After the decline of mechanistic physiology in the late eighteenth century, they become products of the animal’s uncontrollable vitality.

This theory of monstrosity as an excess of the living principle influenced scientists of the 1820s, whose deliberate creation of monsters from chick embryos had odd parallels with Ro-
mantic fiction. The French zoologist Etienne Geoffroy Saint-Hilaire, building on the work of Georges Cuvier and Jean Baptiste de Lamarck, founded a school of philosophical anatomy on the concept of “unity of composition.” The con-
cept allowed Geoffroy and his leading disciple, Etienne Serres, like Hunter, to define monstrosity as something gone awry during “recapitulation,” or self-repetition (Desmond 52–53). The conser-
vative Cuvier rightly feared that these experi-
ments with chick monstrosities would ultimately subordinate human beings to an autonomous law of nature. Indeed, the ground of modern evolutionary theory had already been prepared by Erasmus Darwin, who speaks in Zoonomia (1794) of “changes produced probably by the exuberance and nourishment supplied to the fetus, as in monstrous births with additional limbs; many of these enormities are propagated, and continued as a variety at least, if not as a new species of animal” (501). The physiologist William Carpenter would similarly explain ex-
ceptions to natural law, such as “monsters,” in
his Principles of General and Comparative Physiology (1839) as part of an experimental self-extension by self-propagating matter (Winter 36). For practitioners of the post-Hunterian science of life, monstrosity was not malformed but overexuberant living matter.

Such monstrous profusion was the necessary result of a universe conceived against the mechanistic model. Whereas in Newton’s cosmos each part worked in harmony with the rest toward the functioning of a greater whole, Kant argued in “The Critique of Teleological Judgement,” the second half of The Critique of Judgement (1790), that “this is not enough [. . .]. On the contrary the part must be an organ producing the other parts—each, consequently, reciprocally producing the others.” Following a renewed vitalist natural philosophy, Kant believed that “an organized being possesses inherent formative power, and such, moreover, as it can impart to material devoid of it—material which it organizes. This, therefore, is a self-propagating formative power, which cannot be explained by the capacity of movement alone, that is to say, by mechanism” (2: 21–22). Against the static Newtonian world-clock, whose parts were synchronized according to a mechanistic plan, Kant’s “formative power” exceeds organization.7 Spilling out of the ontological container of the organism, it extends itself to external matter, which it shapes to its own purposes.

In “The Critique of Aesthetic Judgement,” Kant claims, “An object is monstrous where by its size it defeats the end that forms its concept” (1: 100). As mentioned above, Blumenbach’s notion of a formative force presupposes that all organisms tend toward a form, which characterizes them as members of species. Similarly, in Kant’s aesthetic ontology, things in nature exhibit purposiveness; they orient themselves toward a telos that defines them as organized beings.8 Like Hunter’s formative force, pushing out as “so many monsters” through momentary gaps in the organism, the aesthetic magnitude that nullifies its own purpose extends outward to obliter ate the telos of form. David Farrell Krell remarks that Kant’s third critique is “the place where nature’s profusion, and even its sublimely dire forces, come to the fore: Kant refers in passing to one of the ‘most wondrous properties of organized creatures,’ namely, their proclivity to give birth to monsters and malformations” (13). This vitalist concept of a living principle that can assert itself in a monstrous profusion underwrites the Romantic aesthetics of monstrosity. It remains to be shown how this vital force takes creative shape in Lamia.

When Keats lamented the Newtonian propensity to “[u]nweave a rainbow” in the summer of 1819, during the tail end of the Abernethy-Lawrence debate, his real target may not have been the mechanistic philosophy of the physical sciences so much as its application to the science of life. For to deny the poetry of the “awful rainbow” (Lamia 2.231) would be to deny Lamia the living principle that in the end constitutes her monstrosity.9 Her first appearance in book 1 is as a “rainbow-sided,” serpentine seductress (1.54). She enters a dialogue with the god Hermes, who is searching for a nymph whom he adores and whom Lamia has made invisible. Lamia promises that if he will agree to change her into human form she will make the nymph visible to him. Lamia is in love with the Corinthian youth Lycius, whom she marries after her metamorphosis. The main tension in the poem is Lamia’s resistance to her public wedding, for she foresees her destruction under the analytic gaze of Lycius’s tutor, Apollonius. Keats’s original phrase for “Unweave a rainbow” was “Destroy a rainbow” (Poetry Manuscripts 215), and when Lamia first appears in the poem,

She was a gordian shape of dazzling hue,
Vermilion-spotted, golden, green, and blue;
Striped like a zebra, freckled like a pard,
Eyed like a peacock, all crimson bar’ d [. . .].

(1.47–50)
Keats portrays his rainbow as a she, yet instead of a cleanly divided spectrum, rigidly defined by "rule and line" (2.235), she appears as an explosion of color that can only occur in language. As the rigid stripes and bars of color are disrupted with spots, freckles, and eyes, Lamia becomes difficult, if not impossible, to contain in aesthetic representation. Garrett Stewart describes her as a "living mixed metaphor" (10), and David Perkins, labeling these lines a "grotesquerie," points out the "incongruity of the menagerie" (267). Lamia is monstrous insofar as she exceeds the telos of aesthetic form. But as a rainbow imbued with vital power, she is a monstrous object of not Newtonian physics but rather the science of life.

Two weeks after Haydon's immortal dinner party, where Keats and Lamb toasted "Newton's health, and confusion to mathematics" (Haydon 231), Hazlitt remarked that scientific investigation tended to "clip the wings of poetry," which had already received "a sensible shock from the progress of experimental philosophy" (9). In Lamia Keats accuses (experimental or natural) philosophy of something similar:

There was an awful rainbow once in heaven:
We know her woof, her texture; she is given
In the dull catalogue of common things.
Philosophy will clip an Angel's wings,
Conquer all mysteries by rule and line,
Empty the haunted air, and gnomed mine—
Unweave a rainbow [...]. (2.231–37)

This is the same tendency Wordsworth refers to as "murder[ing] to dissect" in "The Tables Turned," and as the elder poet's metaphor of vivisection indicates, it is not Newton's analytic procedures but their application to life that is cause for concern in this period.

Keats observes of Lamia that "there is that sort of fire in it which must take hold of people in some way—give them either pleasant or unpleasant sensation" ("To George and Georgiana Keats," 27 Sept. 1819, letter 199 of Letters [189]), and several forms of fire—"electric fire," "animal fire," "fire-air"—had currency at the time as signifiers for the principle of life. Hunter proposed an analogy between life and fire in his essay "On Life and the Living Principle" (Essays 113–21): "I would consider Life as a Fire, or something similar, which might for distinction's sake be called Animal Fire" (113). Stuart Sperry has spoken of "the fiery pangs of Lamia's etherealization" (303), and one might see the displaced shards of color (the spots, freckles, and eyes that disrupt the clean catalog of Keats's living rainbow) as organic residue of that combustion. For Donald Goellnicht, the "sort of fire" Lamia contains is akin to the "electric fire" or nervous energy with which human beings experience sensation (153). In fact, Keats's description of the monster sparkles with electric life. She is "dazzling," "crimson," "full of silver moons," and burning bright—a "brilliance feminine" (1.47–52, 92). Slightly later in book 1, she "flash'd phosphor and sharp sparks" (1.152). This electric fire animating Lamia would have resonated at a time when electricity was figuratively, if not literally, the spark of life.

The theory that Lawrence referred to deviously in his debate with Abernethy as the "electro-chemical hypothesis of life" held that an electric life force, or a power analogous to electricity, sparked and sustained living matter (Lectures 22). In the late 1780s, Luigi Galvani had popularized the notion of "animal electricity" as an innate vital force or property, distinct from "natural" electricity (59–88), just as Franz Anton Mesmer had introduced the idea of animal magnetism (as distinct from inorganic magnetism) in the late 1770s. Galvani's work spurred a wave of experimentation with galvanic electricity (as this organic power came to be called) throughout the 1790s, and Humphry Davy's turn-of-the-century lectures on electrochemistry fueled the public fascination with it as well as with related phenomena such as "electric fluid" and "electromotion." Davy believed then that continued experimentation might lead to the discovery of a chemical life force similar to, but greater than, heat or electricity. Although Abernethy did not believe (as other vitalists did) that
electricity constituted life, he adhered to what he considered “Mr. Hunter’s opinion that irritability is the effect of some subtle, mobile, invisible substance, superadded to the evident structure of the muscles, or other forms of vegetable and animal matter, as magnetism is to iron, and as electricity is to various substances with which it may be connected” (Enquiry 88–89). This contemporary preoccupation with the idea of an electric life force has received plenty of critical attention, though mostly with respect to *Frankenstein*. Through Mary Shelley, we are familiar with the numerous experiments with galvanic electricity performed on vegetables, animals, human beings, and (as Shelley writes in her introduction to *Frankenstein*) even vermicelli. But Keats’s brightly colored, antimechanistic creature, flashing phosphor and sharp sparks, was also at the crossroads of this debate.

Lamia’s transformation into a human being is a scene of creation strangely analogous to the one in *Frankenstein*, and her electric birth anticipates film versions of *Frankenstein* better than does Shelley’s novel, where the creature comes to life behind closed doors. Unlike Shelley, Keats renders visible the details of electric animation:

> Her eyes in torture fix’d, and anguish drear, Hot, glaz’d, and wide, with lid-lashes all sear, Flash’d phosphor and sharp sparks, without one cooling tear. The colours all inflam’d throughout her train, She writh’d about, convuls’d with scarlet pain: A deep volcanian yellow took the place Of all her milder-mooned body’s grace; And, as the lava ravishes the mead, Spoilt all her silver mail, and golden brede; Made gloom of all her frecklings, streaks and bars, Eclips’d her crescents, and lick’d up her stars: So that, in moments few, she was undrest Of all her sapphires, greens, and amethyst, And rubious argent: of all these bereft, Nothing but pain and ugliness were left. (1.150–64)

Lamia’s short-circuiting colors, her “sharp sparks” and “scarlet pain,” all suggest a galvanic experiment gone awry. As in the cinematic *Frankenstein*’s fiat by thunderbolt, the electro-chemical experiment described above defeats its purpose by giving too much life. Both scenes of creation were intended to produce objects of beauty, and both erupt in monstrosity.

Like Hunter’s principle of monstrosity conceived as the principle of life taken to a radical extreme, Lamia is too much to be contained in a “woman’s shape, and [. . .] woman’s form” (1.118–20). As her sudden explosion into life overwhelms her “dazzling” exterior, she defeats her own purpose and hence her status as beautiful: “Nothing but pain and ugliness were left.” But what are we to make of this ugliness at the core of Keats’s living rainbow? Slavoj Žižek suggests, “In the case of beauty, the outside of a thing—its surface—encloses, overcoats, its interior, whereas in the case of ugliness, this proportionality is perturbed by the excess of the interior stuff that threatens to overwhelm and engulf the subject” (22–23). Lamia is ugly insofar as she is a vital force with the capacity to perturb her proportionality by extending past the limits of form. The excess of her electric life singes her a “deep volcanian yellow.”

Keats refers directly to the contemporary obsession with the possibility of an electric life force in his notes from an anatomy course with Astly Cooper and Henry Cline, Jr. He mentions the effects of “animal electricity” in those strangely charged organisms *Gymnoti electrici*, or electric eels:

> The opinion of late years entertained concerning the Cause of nervous energy was started by Mr J. Hunter. He examined the Body of a Gymnotus Electricus he found it provided with abundance of Nerves sufficient to account for its electric properties. From this he inferred that the Nerves were conductor of electric fluid. Galvani found that a<=> action of y Nerves was produced by applying Metal thereto. The present opinion therefore is that a fluid, like that of the electric is secreted in y brain which is thence communicated along the Nerves. (Note Book 58)
Attempting to penetrate the mystery of life, Hunter cut into the bowels of the electrically charged eel and discovered its vital powers. In his account of this experiment in the Philosophical Transactions of the Royal Society of 11 May 1775, he remarks that the Gymnotus electricus "may be considered, both anatomically and physiologically, as divided into two parts; viz. the common animal part; and a part which is superadded, viz. the peculiar organ" (395).

This "peculiar organ" is the particular object of his study, for it has "peculiar powers" that extend beyond "the common animal part" of the organism. Hunter does not claim to have discovered "animal electricity" but credits the physician John Walsh (1725–95), who performed some of the first experiments with electrical therapy in England and who provided Hunter with an electric eel for dissection.14 Yet Hunter brings to light the "peculiar property" of the eel, the ability to extend its powers throughout—and beyond—its physical organization (much like the monstrous "formative force" informing Kantian aesthetics). And this power of the Gymnotus electricus enacts literally Hunter’s principle of monstrosity.

In 1820 Blumenbach’s student the physiologist Alexander von Humboldt also published the results of his experiments with these Lamia-like creatures, concluding that “Gymnoti are neither charged conductors, nor batteries, not electromotive apparatuses. [. . .] The electric action of the fish depends entirely on its will” (245). Like Keats’s Lamia, of whom we are told that “where she will’d, her spirit went” (1.205), the Gymnotus electricus, according to Humboldt, was “capable of directing the actions of its organs to an external object” (245). As Hermione de Almeida remarks, “Dressed in Lamia’s skin of many colors, these brilliant electric snakes [. . .] used their superior vital power to influence and possess from a distance bodies of lesser vital power” (72). However, this power could not be abstracted from the living organism and put to work as a mechanical force since it was inextri-

cably bound up with the animal’s vitality. Davy concludes in an early lecture on electrochemistry that in the “gymnotus electricus the electrical instrument is composed wholly of living matter [. . .] and, in the case of the galvanic action of the nerves and muscles of frogs, and warm blood animals, the effect is apparently connected with some remains of vitality” (224–25). Like the formative force of Romantic monstrosity, which achieves identity in Keats’s poem beyond the individual subjectivity of Lamia, the "electric force" (Humboldt’s phrase [244]) of the Gymnotus electricus could extend past itself, organizing external matter to its own end.

Coleridge shared Keats’s interest in the Romantic theme of dying into life—along with its antithesis, “The Night-mare LIFE-IN-DEATH,” to which he alludes in The Rime of the Ancyent Marinere (193). That poem also shares a fascination with the monstrous creatures that embodied the analogy between electricity and life. Its climactic scene contains an encounter with electric sea snakes on the order of Gymnoti electrici:

Beyond the shadow of the ship
I watch’d the water-snakes:
They mov’d in tracks of shining white;
And when they rear’d, the elfish light
Fell off in hoary flakes.

Within the shadow of the ship
I watch’d their rich attire:
Blue, glossy green, and velvet black
They coil’d and swam; and every track
Was a flash of golden fire. (264–73)

As the mariner discerns a monstrous profusion of life in the waters surrounding him, the sea seems alive with electric vitality. Scholars have registered the image’s connection to the contemporary scientific culture of galvanism, electromagnetism, and oceanic electrophosphorescence.15 The diversity of interpretation about what kind of “fire” Coleridge intends makes sense given his insistence that the three forces of animal electricity, galvanism, and magnetism were expressions of the same vital power.16 On 12 January 1818,
Coleridge warned Abernethy that “as long as he attempted to work with one Force only (Electricity, for instance) instead of three, all the results would be but approximations to the Truth” and leave him open to the attacks of “Lawrence, and the Materialists” (“To C. A. Tulk” 809). If Coleridge’s sea is alive with an indefinable vitality, which extends past the individual organisms in “tracks of shining white,” “elfish light,” “hoary flakes,” and a “flash of golden fire,” Lamia reflects the “phosphor and sharp sparks” of a similar electric life.

As we know from a letter of 15 April 1819 (written just before the composition of Lamia), Keats encountered Coleridge on a walk and heard his thoughts on a wide range of topics, from “Metaphysics” to “Monsters” (Keats, “To George and Georgiana Keats,” letter 159 of Letters [89]). Like Keats, Coleridge was familiar with mythological lamias from a number of sources, including Andrew Tooke’s standard eighteenth-century schoolbook, The Pantheon (1753). And when in Theory of Life Coleridge defends Abernethy’s idea of a supervenient life force, he refers to Lawrence’s mechanistic division of all matter into “things with life and things without life” as “the twin sisters in the fable of the Lamiae, with but one eye between them both, which each borrowed from the other as either happened to want it” (Shorter Works 489). Unlike John Lempriere in his Classical Dictionary, which is usually cited as a source text for Keats and which presents lamias as devouring women, Tooke describes them in Coleridge’s terms:

There were other Gorgons besides, born of the same Parents, who were called Lamiae, or Empusae: They had only one Eye, and one Tooth, common to them all: They kept this Tooth and Eye at home in a little Vessel, and which each borrowed from the other as either happened to want it” (Shorter Works 489). Unlike John Lemprière in his Classical Dictionary, which is usually cited as a source text for Keats and which presents lamias as devouring women, Tooke describes them in Coleridge’s terms:

Coleridge evokes lamias as figures of false individuation, based on this version of them as abstracted from their individual animal economy, able to put on or take off various parts of their anatomy at will. Detached from the particular assemblage of eyes and teeth, these “Monsters of Hell” (Tooke’s category) are more than physical organization (270). Although we can never know for sure whether lamias fell under the scrutiny of the two poets during their walk, we know that just as Coleridge summons them up against Lawrence’s materialist physiology in Theory of Life, Keats positions his Lamia against a mechanistic science that would presume to “[u]nweave a rainbow.” In both cases, the threatened reduction of life to physical organization sparked a countervision of life as excess.

As Lamia suggests, to exceed the mechanistic spectrum of colors from red to violet is to erupt in pain and ugliness. Just as other Romantic-era monsters, such as Frankenstein’s creature and the Byronic vampire, prove too big for their narrative frames and emerge as cultural icons or myths, Lamia will not be contained within the allegorical web of the poem. Although the narrative seems to invite allegorical interpretations, none have proved completely satisfactory, and what has caused the most confusion of all is the seemingly unnecessary opening frame in which Lamia interacts with the god Hermes and his love object, a soon-to-be-ravished nymph. Read not as a narrative digression but as a sequel to the abruptly terminated Hyperion, Keats’s monstrous vision of life as excess in Lamia provides an alternative vision of what happens to the ravished nymph left out of the end of Hyperion.

The only existing holograph of the Hyperion fragment contains an analogy—omitted from the published poem of 1820—comparing Apollo to fly in their Faces, and strangle them, and tear them to Pieces barbarously. (272)
Keats was enraged that his publishers, John Taylor and James Hessey, should add an “Advertisement” to the volume, without his knowledge, that asserted, “If any apology be thought necessary for the appearance of the unfinished poem of HYPERION, the publishers beg to state that they alone are responsible, as it was printed at their particular request, and contrary to the wish of the author” (Lamia). It was also likely contrary to the wish of the author that the printed version of Apollo’s metamorphosis (3.124–30) eliminated the third through the fifth lines below from Keats’s manuscript:

And soon wild commotions shook him, and made flush
All the immortal family of his limbs
Into a hue more roseate than sweet pain
Gives to a ravish’d Nymph when her warm tears
Gush luscious with no sob. Or more severe;
More like the struggle at the gate of death,
Or liker still to one who should take leave
Of pale immortal death and with a pang
As hot as death is chill, with fierce convulse
Die into life. (Manuscript Poems 55)²⁰

The first edition condenses (and changes) the second to sixth lines above as follows: “All the immortal fairness of his limbs; / Most like the struggle at the gate of death” (3.125–26; my emphasis). In calling attention to the elision, I do not wish to suggest a direct transference, namely that the “ravish’d Nymph” who disappears from Hyperion reappears as the nymph who “cow-er’d, nor could restrain / Her fearful sobs” as she gives herself up to Hermes in Lamia (1.137–38) or that she becomes Lamia, who, “[r]avish’d [. . .] lifted her Circean head” to Hermes shortly before her metamorphosis (1.115). Rather, I propose that in response to Hyperion’s dangling question of what it means to “[d]ie into life,” Keats imagined two scenarios. On the one hand, if, as so many readers have supposed, Apollo dies into the poet-speaker of The Fall of Hyperion, he dies into a material world seemingly stripped of all vitality. While the deposed Titans are “nerveless, listless, dead” (1.323), the speaker struggles “hard to escape / The numb-ness”: “Slow, heavy, deadly was my pace: the cold / Grew stifling, suffocating, at the heart” (1.127–31). The Fall of Hyperion hardly augurs life beyond the material—and barely grants the speaker that. Keats knew himself to be writing against death, and the despair of the poem is in part a metaphysical despair of life’s ever being anything more than a mechanism of heavy limbs. On the other hand, to imagine more than this—to imagine life as an autonomous power with the capacity to exceed its material dimensions—is to imagine something monstrous.

Unlike the uncanny, ghostly figures inhabiting Gothic fiction, the monsters who spring forth from the Romantic imaginary are literally bursting with life. Just as Lamia breaks out of the mechanical bars of the rainbow, Frankenstein’s creature spills out between the fissures in his skin as another figure of excessive vitality. Even the Romantic vampire is gorged with too much life. John Polidori writes in his introduction to The Vampyre (1819) that “these human blood-suckers fattened—and their veins become distended to such a state of repletion, as to cause the blood to flow from all the passages of their bodies, and even from the very pores of their skins” (xx). Frankenstein refers to his monster as “my own vampire, my own spirit let loose from the grave” (Shelley 105), and Lamia too has been perceived as vampiric (e.g., Stevenson; Twitchell). Keats tells us in a footnote to the poem that his story of the philosopher Apollo- ninus, who annihilates Lamia with his skeptical analytic gaze, was derived from Philostratus’s De vita Apollonii as quoted in Burton’s Anatomy of Melancholy (Keats, Complete Poems 359), but certain details in the poem that Burton leaves out are present in Edward Berwick’s 1809 translation, The Life of Apollonius of Tyana, in which “the Empusae, who pass under the name of Lamiae and Larvae [. . .] feed on young and beautiful bodies, for the sake of the
pure blood in them” (qtd. in Daruwala 90n). To be bursting with blood was to be bursting with life, since as everyone in the Keats-Shelley circle well knew, the debate over the principle of life in the early nineteenth century was in part a debate over the nature of blood.22

When Abernethy interpreted Hunter’s theory of life to mean that “life was something of an invisible and active nature superadded to organization” (Enquiry 94), some subtle, mobile fluid pervading the body, communicating itself to matter, and animating it to life, Lawrence responded that “this Hunterian theory of life [...] is no where to be found in the published writings of Mr. HUNTER; and does not ever resemble the speculations on the same subject, which occur in the posthumous work on the Blood, Inflammation, & c. part. I, chap. I sec. 5 on the living Principle of the Blood” (Lectures 78n). Under dispute here is the fifth section of A Treatise on the Blood, Inflammation, and Gun-Shot Wounds (1794), in which Hunter sums up thirty years of research to declare that “blood is endowed with life” (77). The materia vitae postulated by Hunter and hotly contested by Abernethy and Lawrence was supposed to reside in the blood. Of course, the vitalist idea that life resides in the blood has an extensive history. Despite his mechanistic bias, even William Harvey, who discovered the circulation of the blood, considered it a “treasury of life,” “impregnated with spirits,” and “indeed the foundation of life, the source of all action” (47).23 In Keats’s poem, when Lamia denies that she has “Any more subtle fluid in her veins / Than throbbing blood” (1.307–08), she effectively denies the source of her monstrousity, an “invisible and very subtle agent [...] superadded to the obvious structure of the body, enabl[ing] it to exhibit vital phenomena” (Lawrence, Lectures 78). She disclaims, in other words, the supervenient “subtle fluid” equated with life.

Because Lamia will not be contained by the formal telos of the beautiful—or its teleological expression in the form of organized life—she appears monstrous in her own magnitude. Nevertheless, she exhibits the seductive appeal of monstrousity as a Romantic version (or perversion) of sublimity. Lycius’s first encounter with her is described as follows: “And soon his eyes had drunk her beauty up, / Leaving no drop in the bewildering cup, / And still the cup was full” (1.151–53). As Lamia overruns “the bewildering cup” of her beautiful form in an abundance that Lycius can never fully consume, she becomes a devouring presence who inverts the rules of aesthetic contemplation. She tells her lover Lycius (as if in warning) that she desires a place “Where I may all my many senses please, / And by mysterious sleights a hundred thirsts appease” (1.284–85). Instead of the five senses by which we register sensation, Lamia boasts an unbounded “many.” In the place of a single thirst, she has “a hundred,” which she must try to appease by “mysterious sleights,” since by all standard means they are unappeasable. She spills over the brim of “the bewildering cup” in more ways than one, and the feast she offers her guests is likewise conceived as an extravagant excess. Keats describes the banquet hall “[t]eeming with odours,” “[t]he fretted splendour of each nook and niche,” and every square inch of wall space erupting with uncontainable vitality as “there burst / Forth creeping imagery” (2.133–40). One suspects that this is indeed “the symbolic extroversion of her innate qualities in the banquet décor” (Stewart 31). Asserting herself as an uncontrollable overabundance, Lamia is more than human—or more than material organization alone would allow.

If Lamia represents a vital—if monstrous—response to the looming question of what it means to “[d]ie into life,” Lycius comes to embody the other extreme. In the final line of the poem, after Lamia’s sudden disappearance (under the stern gaze of Apollonius), he is reduced to an “it,” a “heavy body” (2.311). As Keats would have known, experimental natural philosophy grew out of Newton’s experiments showing that heavy bodies falling to earth follow the same
laws of gravitation as heavenly bodies in orbit. Lycius’s “heavy body” would fit all too well into Newton’s schema, which had no place for an intangible, unquantifiable life force. From this perspective, Lycius becomes the poem’s material remainder, a heavy body that would sink naturally into the shady vale of The Fall of Hyperion alongside all the other heavy bodies of the fallen gods. In a materialist world, deprived of all hope of redemption, one’s pace is necessarily “[s]low, heavy, deadly.” Yet I submit that the final tragedy of Keats’s unfinished epic is not the reduction of the human to a mechanistic collection of limbs, a heavy body deprived of its living principle like Newton’s rainbow deprived of its poetry. Rather, it is the possibility that to die into anything more than this is to become too much—to become monstrous in the eyes of a calculating world.

NOTES

I am grateful to the Keats-Shelley Association of America for a Carl H. Pforzheimer, Jr. grant to research this project, early versions of which were presented at the MLA Annual Convention in 2000 and the North American Society for the Study of Romanticism Conference in 2001.

1 Newton’s major works, Philosophiae naturalis principia mathematica (1687) and Opticks; or, A Treatise of the Reflexions, Refractions, Inflexions, and Colours of Light (1704), established the principles and methods of quantitative natural philosophy. Schofield and Thackray demonstrate the numerous scientific schools of thought emanating from Newton that were operative throughout the eighteenth century.

2 The notion of a supervenient vital power that could animate matter was nothing new; in response to seventeenth-century iatrochemical and iatromechanical models of human physiology (themselves responses to animistic and scholastic models), theorists from George Ernst Stahl (1660–1734) to Paul Joseph Barthez (1734–1806) proposed various causae vitae, including “forces,” “powers,” “properties,” and “principles.” Brown, de Almeida (87–110), Göde–von Aesch (183–203), Goodfield-Toulmin, Hall (2: 5–278), and Schofield (191–231) provide helpful accounts of the rise of vitalism.

3 From 1740 the practice of physiology began to swerve from Newtonian mechanistic techniques toward a new vitalism whose central concern was the nature of the living principle. When this transition began, the standard authorities in British physiology were the iatromechanists (Giovanni Alfonso Borelli, Lorenzo Bellini, Giorgio Baglivi, Archibald Pitcairn) and the iatrochemists (Jean Baptiste van Helmont, Franciscus Sylvius, Thomas Willis). By the second half of the century, Albrecht von Haller (1707–77) had identified certain vital phenomena, namely sensibility and irritability, that could not be accounted for by the laws of physics and chemistry, enabling the science of life to emerge from under the shadow of Newton.

4 For a related argument, which I encountered after completing this essay, see Hagner, who focuses on the epigenetic redefinition of monstrosity by Caspar Friedrich Wolff and its application by Samuel Thomas Soemmerring.

5 Blumenbach introduced the idea of a formative force, by which living creatures take a certain form, maintain it, and reproduce it in case of destruction, in his 1780 essay “Über den Bildungstrieb (Nisus Formativus) und seinen Einfluß auf die Generation und Reproduktion” (“On the Formative Force and Its Influence on Generation and Reproduction”); my trans.). The essay was later expanded into Über den Bildungstrieb und das Zeugungsgeschäfte (1781), which was translated into Latin in 1785 and issued in English in 1792 as An Essay on Generation. On the fertility of the concept of the formative force for German Romanticism, see Gode–von Aesch (198).

6 Hunter’s materia vitae was an invisible hypothetical substance, unlike the visible vital matter that microscopists (e.g., C. F. Wolff, Otto Fredrik Müller, Abraham Trembley) were investigating and that became, under the designation “protoplasm,” the materia vitae of the nineteenth century.

7 As Walter D. Wetzel points out, “The word mechanisch became [. . .] in general the polemic adjective in the battle against the old [Newtonian] and for the new organic physics” (46).

8 While for Kant the power of self-formation was sufficient to distinguish living from nonliving matter, Blumenbach came to believe that it was one of three vital (as opposed to “dead”—i.e., physical, chemical, or mechanical) powers, namely “[o]rganic formation and increase; motion in the parts when formed; sensation from the motion of certain similar parts” (Institutions 18). On Blumenbach’s influence on Kant, see Lenoir.

9 As the mechanistic Newtonian worldview was on the decline and vitalist theories were on the rise, Christopher Smart also attempted to put some poetry back into Newton’s rainbow, in fragment B (648–59) of Jubilate Agno (1758–63). Epstein and Greenberg, Jones, and Nicolson discuss the effect of Newton’s Opticks on eighteenth-century poetry.

10 His A Discourse, Introductory to a Course of Lectures on Chemistry (1802), probably the text Mary Shelley read on 28 October 1816 while working on Frankenstein, describes galvanic electricity as “a new influence [. . .] which had enabled man to produce from combinations of dead matter effects which were formerly occasioned only by animal organs” (qtd. in Crouch 37). On the contemporary public culture of electrochemistry, see Golinski (188–235).
Lawrence countered that "there is no resemblance, no analogy between electricity and life: the two orders of phenomena are completely distinct; they are incommensurable. Electricity illustrates life no more than life illustrates electricity" (Introduction 170–71). However, just as Hunter had denied a direct equation of life and fire ("I do not mean real and actual fire; but something that is similar, and is effected and brought about much in the same manner" [Essays 1: 113]), Abernethy denied a direct equation of electricity and life: "It is not meant to be affirmed that electricity is life. There are strong analogies between electricity and magnetism, and yet I do not know that any one has been hardy enough to assert their absolute identity" (Enquiry 51). Despite his disclaimer, Abernethy has been misunderstood as maintaining this equation.

An accomplished and rapidly growing literature on Shelley and science commences with Crouch, Mellor (89–114), and Vashinder.

On this concept of the ugly in Frankenstein, see Giganare. Adorno considers ugliness (a gap in eighteenth-century aesthetics) as a political phenomenon (45–61); and, as Hanafi has shown, from the early modern period interpretation of monstrosity has been "nothing less than an alternative political science" (3). Cf. Baldick on this aspect of monstrosity in Frankenstein.

Such experiments began at mid-century; in 1748 the British physician Henry Baker made a case for the medicinal use of electricity as practiced elsewhere in Europe (270).

See Rzepka for a concise critical history (pars. 20–22).

Here Coleridge is influenced by German Naturphilosophie, in which "electricity, galvanism, and magnetism inevitably came to be depicted as the manifestations of life in all of nature. [...] Schelling then projected these three phenomena into the realm of living organisms where they reappeared as reproductivity, irritability, and sensibility" (Wetzel 47).

This division, originally made by Galileo, was the founding gesture of the modern mechanism-vitalism debate. Unlike Galileo, for whom only inanimate motion could become the subject of science, Descartes considered animals machines with a library of reflexes (with the exception of human beings, whose will exerted itself through the pineal gland). Descartes’s student Julien de la Mettrie later added with this exception in L’homme machine (1748). As bookends to the mechanism-vitalism debate, see Jaynes on Descartes’s discovery of the reflex and Mayr on the present-day argument against vitalism (51–53).

Lempière’s lamias were "monsters of Africa, who had the face and breast of a woman, and the rest of their body like that of a serpent. They allured strangers to come to them, that they might devour them" (31).

Rollins records that in one copy of the volume, Keats scratched out the advertisement, writing above it, "This is none of my doing—I w[as] ill at the time" (Keats, Letters 277n). Jack Stillinger, in the introduction to the Keats holograph, interprets this to mean that "Keats did not want Hyperion included in the volume" (xi). I read the publishers’ claim that the volume was printed "at their particular request" to mean that Keats gave his consent but was embarrassed by the announcement that an apology might be thought necessary. Ironically, Hyperion was the best-received poem in the volume throughout the nineteenth century.

Keats also considered the following deleted line after 3.125: "Roseate and pained as any a ravish’d nymph" (Manuscript Poems 55). In the blank half-page following the end of the Hyperion fragment, Keats’s friend John Woodhouse penciled his own suggestion for a revision to follow this line: "Into a hue more roseate <as> than a Nymph’s / By a warm kiss surprized" (Manuscript Poems 182), toning down the degree of sexual ravishment. Stillinger does not mention the missing analogy to the "ravish’d Nymph" in his notes to Keats’s Complete Poems.

Not only the advertisement but also Keats’s complaint to Taylor of other unauthorized changes to the volume (e.g., "To John Taylor," June 1820, letter 263 of Letters [294–95]) and his reference to the book manuscript as "my or rather Taylor’s manuscript" ("To Fanny Brawne," Apr. 1820, letter 257 of Letters [286]) suggest that the elision was made by the publishers. Stillinger notes that Woodhouse insisted the surviving holograph was not a revised or second draft but "the original & only copy [. . .] composed & written down at once as it now stands"; Leigh Hunt considered it "the original manuscript," and Stillinger suggests that "probably we should accept Woodhouse’s and Hunt’s terms" (xi). I am inclined to find further evidence for Taylor and Hessey’s intervention in the change from “family” to “fairness” (3.125); Keats’s phrase “family of his limbs” is one that Mary Shelley, for example, also used.

In Bram Stoker’s fin de siècle rewriting of the Romantic vampire myth in Dracula (1897), the madman Renfield asserts, "The doctor here will bear me out that on one occasion I tried to kill him for the purpose of strengthening my vital powers by the assimilation with my own body of his life through the medium of his blood" (301).

Hall (1: 241–49) and Temkin (153–64) offer useful accounts of Harvey’s theory of blood.

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