McGill University

# At the Heart of Romanticism:
# Blood Circulation in the Works of William Blake, Percy Bysshe Shelley, John Keats, and Mary Shelley

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**English Abstract**

Tracing the intersection between literature, haematology, and circulation in William Blake's *The Four Zoas* and *Jerusalem*, Percy Bysshe Shelley's "Alastor" and "The Sensitive Plant," John Keats's "This Living Hand," and Mary Shelley's *The Last Man*, I aim to diverge from previous explorations of blood imagery in literature, which have mainly considered this biological substance from religious, political, gothic, gendered, and familial angles. Blood often reflects a single individual or group's body, family, and history. Instead, I analyze how blood moves within and without the body, as well as across both space and time in the works of these Romantic writers in order to conceptualize an ecological form of blood that can be viewed as a connective force or medium and that ensures communication between human and nonhuman bodies.

**French Abstract**

Analysant l'intersection entre la littérature, l'hématologie et la circulation dans *The Four Zoas* et *Jerusalem* de William Blake, "Alastor" et "The Sensitive Plant" de Percy Bysshe Shelley, "This Living Hand" de John Keats et *The Last Man* de Mary Shelley, je diverge des explorations antérieures de l'imagerie sanguine dans la littérature, qui ont principalement considéré cette substance biologique sous des angles religieux, politiques, gothiques, genrés et familiaux. Le sang représente souvent le corps, la famille et l'histoire d'un individu ou d'un groupe. Dans ces études, je recherche comment le sang se déplace à l'intérieur et à l'extérieur du corps, ainsi qu'à travers l'espace et le temps dans les œuvres de ces écrivains romantiques afin de conceptualiser une forme écologique de sang qui peut être considérée comme une force ou un médium conjonctif et qui assure communication entre les corps humains et les corps non-humains.

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## Introduction

Now let us imagine, if you please, a tiny worm living in the blood, capable of distinguishing by sight the particles of the blood—lymph, etc. —and of intelligently observing how each particle, on colliding with another, either rebounds or communicates some degree of its motion, and so forth. That worm would be living in the blood as we are living in our part of the universe, and it would regard each individual particle of the blood as a whole, not a part, and it could have no idea as to how all the parts are controlled by the overall nature of the blood and compelled to mutual adaptation as the overall nature of the blood requires, so as to agree with one another in a definite way. [...]

But since there are many other causes which do in a definite way modify the laws of the nature of the blood and are reciprocally modified by the blood, it follows that there occur in the blood other motions and other changes, resulting not solely from the reciprocal relation of its particles but from the relation between the motion of the blood on the one hand and external causes on the other. From this perspective the blood is accounted as a part, not as a whole.

—Baruch Spinoza, Letter 21, *Complete Works* 848

### Literary Lines; Lines of Blood

Spinoza, in a letter to Willem van Blyenberg in January 1666, detailed the relationship between parts and wholes in the universe through an analogy in which a worm, floating in blood, represents the perspective of a human being. Blood connects to and reflects external causes, just as bodies in nature are driven and determined by bodies from without. Spinoza presents a bodily

metaphor: a worm living in blood would see the particles as its whole universe, rather than as parts of a larger world. From Spinoza's perspective, humans are those worms that often are unable to realize the impact of larger forces upon our moving bodies. Although Spinoza writes that the universe, unlike blood, presents infinite qualities for many potential combinations between bodies, the Romantic writers, I argue, drew on the biological—and potentially ecological—substance of blood and infused it with creative potential. These writers illuminated the ways in which the blood of different bodies flows beyond their frame and interacts with nonhuman organisms, elements, and atmospheres at large.[1]

In the field of medical history, Fay Bound Alberti's *Matters of the Heart* details the faculties of the heart and the persistence of this symbol across different cultures and periods even after the rise of neurology (3, 15). Alberti specifies that in the nineteenth century, the organ of feeling was deemed the brain (38), since the heart became viewed as displaying more reactive gestures rather than active ones (142). In the twentieth century, Alberti notes the interchangeability of different hearts with the development of scientific procedures, whereas the brain seemed more representative of the individual person (155-156). Yet, not only does the heart continue to persist in culture, but it also rings with a personal note as well (15). The duality of heart and blood, which oscillates between the individual and society, between the interiors of the body and the external world, is a concern that I delve into in the chapters of my thesis. Furthermore, Alberti examines the heart's scientific history on the one hand, and its cultural associations on the other, and she takes an interdisciplinary approach that I also advance in my own argument.

Situated between self and world, the cardiological system of different organisms is linked to—beyond the health or illness of the body—emotional reactions, which are an intimate part of

the body in the act of religious sacrifice or martyrdom, the indication of war and violence, the vital principle that sustains life, inheritance and family lineage, aristocratic birth, and multiple phrases that use blood as a metaphor for different actions (*OED* "blood, n."). On the one hand, the personal definition of blood changed throughout history, especially in relation to a certain group, culture, or lineage. David Warren Sabean and Simon Teuscher, in their introduction to the anthology *Blood and Kinship*, assert that even though blood represents family and kinship, kinship in European history is not a stable entity (1, 2). In their perspective, the idea that blood represented the "substance shared by descendants had a rather short and very discontinuous life in European history" (14). Indeed, the concept was not prevalent in the Middle Ages and instead formed in the early modern period, "with the rise of agnatically structured lines and lineages, then lost its relevance" due to the horizontalization of kinship in the eighteenth century (14). Blood moved into the public sphere and designated ties within a specific nation and race instead (14), which, I would argue, nonetheless remains a limited definition of blood that restricts itself to a certain culture.[2]

On the other hand, blood was and remains a highly social construct that defies certain boundaries and borders, whether bodily or geographic, in the literal instance of blood transfusions and the more emotional bonds that arise from coming into contact with others. Catherine Waldby and Robert Mitchell's *Tissue Economies* presents the connections that blood banks foster and the social distribution of biological material through these institutions among others. In the context of these medical processes, Waldby and Mitchell argue that "one body can share its vitality with another through the redistribution of tissues, from donor to recipient, through biotechnical intervention" (2). They go further to suggest that blood is imbued with "ideas and feelings about nation, citizenship and community, and the place of the body" (2).

With a nod to Michel Foucault, they note that blood began to be equated "with race and race with national citizenship" in the nineteenth century (3). According to Foucault, the ties between blood and nobility shifted in the nineteenth century to bring in concerns about different races and cultures (223), which is what I mentioned above with reference to *Blood and Kinship*. Waldby and Mitchell assert that the concept of blood, as "a gift of health to an unknown other with whom one has nothing in common other than the shared space of the nation," is tinged with Benedict Anderson's theory of imagined communities (4). However, they note that blood banks are not without their negative side, since certain people have become associated with "contaminated blood" (6). There is also an underlying economic tone to the entire process of blood giving and blood banks: "Makers of health policy in the United Kingdom have favored, for the most part, a gift model for managing human tissues" (8). According to Richard Titmuss's *The Gift Relationship*, there are different dimensions to gift giving. Waldby and Mitchell refer to Titmuss's text and claim that gifts may not be entirely altruistic if they reflect hierarchies or personal power, yet the gift of blood is a special case in Titmuss's view because, apart from being voluntary and often non-reciprocal, "it is impersonal, transmitted from one stranger to another, and so lacks the element of personal aggrandizement and indebtedness" (15). In a short yet poignant line, the two argue that "Blood is both an intimate part of a person and a circulable substance that can be given to another under conditions of mutual anonymity" (15). Titmuss himself also specifies that the donation is rarely whole blood and often parts of blood go to different recipients, which creates a network of branching, social ties (22). Blood fractures in different directions, thereby splitting into a web of connections and threading people together.

Extending Waldby and Mitchell's and Titmuss's investigations in another direction, I argue that the sociality and relationality of blood ties are prominent concerns in the works of

several Romantic writers, such as William Blake's *The Four Zoas* and *Jerusalem*, Percy Bysshe Shelley's "Alastor" and "The Sensitive Plant," John Keats's "This Living Hand," and Mary Shelley's *The Last Man*. Specifically, blood not only represents the bond between members of a family, a group, or culture, but goes beyond that to signify potential relations and connections between different bodies and species, which include nonhuman organisms, such as animals and plants, and atmospheric phenomena, such as winds, rain, and light. Therefore, blood does not simply sit on the line between literature and science, but also rises into the dynamics of ecology, such that we are able to read these texts with what I term a "bio-ecological" lens. Blood circulates and changes with each new interaction that it registers, as it passes the boundaries of the individual body and leaves traces of itself on others, and they on us.

**Previous Literary Criticism: A Tripartite Portrait**

Blood is a central figure of the imagination and it is pertinent to multiple eras, literatures, and theoretical frameworks. In terms of the medieval and early modern period, the essays within Bonnie Lander Johnson and Eleanor Decamp's anthology titled *Blood Matters* trace the significance of this bodily image from 1400 to 1700. Johnson and Decamp emphasize the fact that this is a diverse, interdisciplinary collection that spans multiple periods and fields: "this book is offered as the first wide-ranging, interdisciplinary study of blood in Western Europe ca. 1400–1700, bringing together historians, literary scholars, and drama specialists" (2). Moving into the nineteenth century, Ann Louise Kibbie's *Transfusion* looks to the period where blood transfusion was beginning to be systematized as a viable and safe medical remedy, during which "literary texts that depict transfusion share with the contemporary medical discourse an interest in imagining a bodily economy that extends beyond the boundaries of the individual person,

creating both promising and profoundly threatening exchanges" (2). Indeed, Kibbie gestures toward Waldby and Mitchell's book to further support her point (5). This revival of interest in blood transfusions began with James Blundell in the beginning of the century, and promoted a liminal discourse where there is the "complicated coexistence of the archaic and the modern, the semi-magical and the rational, the spiritual and the scientific, the mystical and the mechanistic" (3, 9). However, unlike modern economies of blood exchange which tend to be anonymous, Kibbie asserts that in the nineteenth century, "transfusion embodies ... preexisting affective, familial, or social bonds between donor and recipient" yet nonetheless "has the potential to create an entirely new form of stranger intimacy" (11). She looks into texts that "explore the satirical, sensational, and gothic potentials of such new, fluid ties between strangers" (11). In terms of the Victorian period, Jules Law's *The Social Life of Fluids* presents different substances or fluids as unpredictable channels (2). The novels of Victorian England, he contends, recognize "fluids as objects of social technology, ... as objects proper to discipline and manipulation in the name of civic and collective interests" (2). In short, "fantasies about controlling fluids became inextricably bound up with fantasies of their infinite fungibility" (2). One of his chapters centres on Dracula as he claims that blood still had occult resonances at this time and "[contained] within it the secret of character, ethnicity, and temperament" (5). On the other hand, Aspasia Stephanou's *Bloodlines* focuses specifically on the figure of the vampire and the ways in which this figure also challenges existing boundaries (2-3). Stephanou examines how "blood is represented through the discourses of science, continental, feminist and postmodern philosophy and in vampire novels, films and vampire communities" (4). Victorian literature appears to be of a piece with studies on cardiology. Kirstie Blair provides another view with her focus on Victorian poetry in *Victorian Poetry and the Culture of the Heart*. For Blair, "The heart is both

material and spiritual, public and private, active and passive; the most intimate part of an individual yet the most detached, in the sense that its actions cannot necessarily be controlled. Poetry provides the clearest instance of these negotiations" (4). She distances herself from representations of the heart in Romantic literature, which she suggests are often positive, and instead takes up the pathological, diseased, and alienated heart that recurs in Victorian poetry (7). Her study branches out to consider medicine, religion, and gender (10). Blair is right to assert that the heart has been a concern for Romanticists, especially with the recent rise in interdisciplinary studies that bridge the arts and sciences.

**Romanticism, the Anatomical Body, and the Environment**

Before delving into a few specific examples where blood comes to the fore in discourse on Romantic poetry and prose, I begin with a broad overview of recent Romantic criticism that touches on both bodily and ecological issues, figures, and patterns. Blood runs throughout the poetry and prose of Romantic authors as a recurring motif that brings to light the immersion of the body's circulatory system in the creation of different forms of art. Therefore, blood aligns with Jane Bennett's concept of "actants," which are nonhuman entities that intermingle with human beings in active ways, exuding vitality through their movements and influence (94).

Critics have mapped Romantic literature's exploration of active nature in relation to many different terms, figures, and themes. Their monographs fall into two main categories which are not mutually exclusive: the biological body and the ecological environment. Amanda Jo Goldstein's *Sweet Science* asserts that "Romantic 'sweet Science' [is] a strategic redeployment of Lucretius's poetic materialism, unfolding the unrecognized presence and unfamiliar implications of that classical poetic physics within famously Romantic concerns" (2). Goldstein

refers specifically to Lucretius's *De rerum natura* as her text of departure. Indeed, she argues that "Lucretian materialism—a materialism that granted substance to tropes and tropic activity to nonverbal things—afforded Romantic claim upon the real at an early nineteenth- century moment when disciplinary consolidation was rendering that claim incredible" (7). Furthermore, "Romantic neo-Lucretianism poses a challenge to the ongoing presumption … that 'matter' and 'the body' are what suffer, resist, or elude—rather than produce, demand, elaborate, or perpetuate—signification and the imposition of discursive, cognitive, social, and political form" (7). In her book, writers such as Blake, Goethe, and Shelley come into conversation with Erasmus Darwin, Herder, and Lamarck. Denise Gigante turns to biological sciences and discusses the topic of epigenesis in her book titled *Life*. According to Gigante, writers of the Romantic period were grappling with the intricacies of vitality and living form, as well as the concept of power (3-4). She looks into the works of Christopher Smart, William Blake, Percy Bysshe Shelley, and John Keats "that seem to defeat their own formal and allegorical structures" (6). Her purpose is to "provide a methodology for reading these seemingly 'formless' forms as manifestations of an epigenesist poetics" (6). Indeed, epigenesis is a biological process that is both conservative and allows for change (29).

Continuing with this bodily theme, Richard C. Sha explores the intersection between literature and science in his aptly titled book *Imagination and Science*. He claims that "both Romantic artists and scientists seized upon the imagination to connect more fully with experience of objects, not to leave them behind" (3). He deems this a "turn to phenomenality [or] the feltness of experience" (3). The object itself was "imagined as having some relationality to the subject as well as other objects" (3). For Sha, "Romantic matter explodes with difference," and therefore there can be no opposition that separates materiality and figuration (10). This form

of imagination was curiously disciplined, rational, but also feeling (11). He brings figures such as Humphry Davy, Joseph Priestley, Goethe, and others into contact with literary works of Blake, Shelley, Coleridge, and Mary Shelley. Another scholar who has a similar focus is Alan Richardson. His book *British Romanticism and the Science of the Mind* touches upon neurology and Romantic literature, whereas his more recent book *The Neural Sublime* combines research in neuroscience with different perspectives on the sublime. Richardson asserts that "the 'cognitive' is historical, naming processes and capacities unfolding (at the species level) in evolutionary time and (at the individual level) in developmental time, always (in both cases) in relation to specific physical and social environments, that are … caught up in a ceaseless process of historical change" (*Neural* 3). In Richardson's view, Romantic literature brings to light various topics that interweave mind and body, such as the organic mind, the unconscious powers of the mind, "kinship between human and animal minds," the centrality of instinct, and so forth (*Neural* 11). In one chapter, he contends that Romantic poets such as Keats and Shelley may put forward a form of sublime which is itself corporeal rather than transcendental (*Neural* 25). He takes up works by Wordsworth, Keats, Shelley, Coleridge, and Austen.

In another vein, other researchers of eighteenth-century literature have focused on the connection between literature and different elements of the environment, such as air, water, sun, and earth. Beginning with Jayne E. Lewis's *Air's Appearance*, Lewis analyzes the works of Joseph Priestley—who was an eighteenth-century specialist on different components of air—and how they are brought to bear upon the literature of writers such as Alexander Pope and Ann Radcliffe. She chiasmically shows how Priestley's journals are literary in their own right as well. Moving to the topic of weather, Mary A. Favret's *War at a Distance* considers how distant effects of war are subtly registered in daily and mundane events of the home and of native

countries. With an emphasis on colonial issues, Siobhan Carroll examines authors such as Mary Shelley, Samuel T. Coleridge, and Sophia Lee in order to argue that both air and water are spaces which are "atopic" in the sense that they refuse, unlike land, to be easily colonized and taken over. Ted Underwood takes issues of the sun, energy, and economy into account in his monograph *The Work of the Sun*. On the subject of plants and organisms, Alan Bewell's *Natures in Translation* considers the ways in which natures—in its plurality—moved around and diversified, bringing along new problems, with the rise of colonialism and imperialism during the eighteenth century. Finally, in terms of geology, Noah Heringman looks at the rock record and other geological motifs in order to illuminate their connection to Romantic literature.

Moving in another direction, my project bridges the biological and ecological spheres of Romantic literature by focusing on the cardiovascular system. I argue that both the heart and its circulation of blood register external nature—such as other bodies, atmospheres, and weathers—in the works of Blake, the Shelleys, and Keats. Blood flows through the writing of these Romantic authors in a communicative way such that this substance brings together identity and artistry with material and natural bodies; therefore, the circulation of blood moves beyond a single body's history to register and respond to other organisms, energies, and elements.

**Romanticism and Blood Imagery**

Within the monographs of the aforementioned scholars, there are certain chapters or analytical passages that bring up the topic of blood, cardiology, or haematology, but few have used the heart as the central symbol of their book. John Beer and Ian Haywood are exceptions. Beer's *Wordsworth and the Human Heart* is a key example. In a brief but illuminating line, Beer asserts that "The heart can engage itself to others – and this statement, like others have

examined, is not *simply* metaphor: the actual movements of physical heart and physical bloodstream can be intimately involved in such engagement, giving urgency to love (or for that matter jealousy)" (16, emphasis in original). For Beer, the heart does not solely represent the man, but rather "his relationships with other animated beings" (16). Ian Haywood veers in another direction with his book *Bloody Romanticism*, which investigates British Romanticism and its relation to "violent events" such as slavery, revolution, rebellion, and riots (2). He aims to "bring these different areas of conflict together and to study their shared and interactive discursive practices" (2). Specifically, he analyzes "spectacular violence" and its entanglement with themes of sensibility and the sublime (3); in short, readers of this period were confronted with "bloody vignettes" that delivered them to a "world of violence" (4). Kevis Goodman also briefly touches upon the relationship between blood and literature in *Pathologies of Motion*. She analyzes the pathological science of the eighteenth century but draws away from topics such as Herman Boerhaave's mechanical body and cardiology, which she states are more limiting according to thinkers like William Cullen (40-41, 45). Instead, she focuses instead on the nerves and on neurology at large. Beyond that, she looks into the tension between balance and disorder in diseases such as nostalgia, which was then defined as homesickness. Goodman shows how pathology is itself an art and philosophical practice not unlike its literary counterpart (9).

**The Overall Argument and the Three Chapters**

With such a plethora of critical analyses—crossing genre, form, and period—in mind, I narrow my argument to the works of Blake, Percy Bysshe Shelley and Mary Shelley, and Keats in order to trace the ways in which blood lines form the basis of social relationships between different bodies and between humans and nonhumans, such that blood becomes a way of

imagining new connections that offer horizontal patterns rather than vertical, human-centred hierarchies. Taking Goodman's claim in another direction, I hope to illustrate that blood, even from the perspective of a mechanist like Boerhaave, can take on flexible qualities in these Romantic texts.

The theoretical framework of my project connects Jane Bennett's concept of vital, nonhuman actants (94), with certain aspects of Deleuze and Guattari's theory of rhizomes, especially concerning the centrality of lines crossing between different fields rather than one, continuous lineage (21). Folding these theories together with Maurice Merleau-Ponty's "flesh", an elemental force which implies "the synergy [existing] between different organisms" and the connection between the sentient and sensed (142), I build on the work of Drew Leder, who extends this fleshly concept to blood and asserts that blood belongs to both the world and the self (214). I hope to intertwine the medical humanities with ecocritical views, such as that of Lawrence Buell. One of Buell's criteria for environmental texts is "some sense of the environment as a process rather than as a constant or a given is at least implicit in the text" (8). Although Buell focuses mostly on Thoreau, his view is applicable to other texts as well, especially British Romantic ones. Buell himself gestures toward Romantic ecocritic and scholar Jonathan Bate several times in his introduction. I hope to show that blood circulation is a process that enfolds, though not seamlessly so, both the individual body and the larger environment into the same fabric. My argument echoes what Donna Haraway proposes as the concept of "sympoiesis" or what she deems "making-with" other people and networks (5).

I build on the work of these critics by extending blood circulation outside the body in order to meditate on the meaning of blood across species in Romantic poetry and prose of the long eighteenth century. The "blood-lines" that I come across in these Romantic texts have

affinity with what Anahid Nersessian, with a gesture to Blake's lines of art, calls the bounding line: "I propose … that the Romantics think about utopia in the same way as they think about art, as a means of capturing and thereby emancipating an infinite human potential within a finite space … in the same sense as mathematicians speak of bounded infinity and Blake speaks of his bounding line" (19). These lines are much like the lines of Antamon, who is a minor character that Goldstein analyzes in her chapter on Blake. She claims that Antamon demonstrates the diversity of hands that draw together Blake's literary world: "The line originates both within the Spectre's body and within Antamon's pen, belonging to observer and observed as a negotiable boundary that determines the shape of each. Here both livable form and its science are, between fact and construct, outcomes of bilateral figuration that is anything but 'mere'" (65-66).

For my thesis, I bring together natural philosophers and Romantic writers. The thoughts and theories of certain scientists, beginning in the seventeenth century and stretching into the nineteenth, find parallels in various literary works. Focusing on individuals such as Boerhaave, Albrecht von Haller, John Hunter, Stephen Hales, and Erasmus Darwin, I show how many ideas concerning blood and natural circulation come together to show the interconnectedness of all organisms, even if some thinkers may appear initially as rigid mechanists. The thesis will be divided into three chapters. The first focuses on Blake's two, long epics and connects them to the chemistry of the long eighteenth century in order to suggest that Blake may be imagining a way in which human bodies can learn to understand—through the concept of flexible bloodlines—nonhuman organisms. Central to this chapter will be Boerhaave, a chemist and teacher who wrote extensively on the different functions of chemistry, especially how this science can allow for surprising combinations of existing elements. The second chapter looks toward Shelley's two poems, and ends with Keats. The key idea here is the ways in which bodily circulation such as

blood interacts and overlaps with other forms of environmental circulation such as cycles of water, air, and sap. Hales, among other natural philosophers, is crucial because he used similar techniques to discover the rate of the fluids in both animal and plant bodies. Finally, the last chapter turns to prose to illustrate the fact that this concept of refashioning bloodlines was also present in Romantic novels, specifically a later novel of Mary Shelley. When the protagonist and narrator Verney loses his family to the plague and realizes that he may be the last survivor on this earth, his idea of bloodlines changes as his earlier cruelty toward animals transforms into humble attempts to reach out to them, and even heal them in one instance. The story ends strikingly with a scene of Verney venturing away with a stray dog that decides to follow him, so much so that their steps are shared (Shelley 468). Shelley encourages readers to consider the ways in which new relationships and bonds may form when pre-existing social structures have collapsed.

Taken together, I hope we can begin to consider blood in an impersonal way, such that it represents relationality and connection to other people, and to other species. Beyond that, I aim to illuminate the striking revelations that can be made when reading and analyzing Romantic literature alongside the scientific research of its time.

# Notes

1. For a more detailed account of the intersection between literature and Spinoza, see Marjorie Levinson's *Thinking through Poetry*.

2. The image of blood figures in multiple critical works that discuss issues of both race and nation. These include but are not limited to the following: Jean E. Feerick's *Strangers in Blood: Relocating Race in the Renaissance* (2010); Subramanian Shankar's *Flesh and Fish Blood: Postcolonialism, Translation, and the Vernacular* (2012); Sheila Marie Contreras's *Blood Lines: Myth, Indigenism, and Chicana/o Literature* (2008); Ratteree and Hill's *The Great Vanishing Act: Blood Quantum and the Future of Native Nations* (2017); Véronique Maisier's *Violence in the Caribbean Literature : Stories of Stone and Blood* (2015).

## Chapter One

The Metamorphosis of Blood: William Blake's Chemical, Circulatory Poetics

### Introduction

Folding the period of six thousand years into the flutter of a pulse within the body, William Blake writes in *Milton*: "For in this Period the Poets Work is Done: and all the Great / Events of Time start forth & are concievd in such a Period / Within a Moment: a Pulsation of the Artery" (Plate 29: Lines 1-3; E 127). With the alliterative notes of "period," "poets," and "pulsation," Blake illuminates the fact that the poet's work and the events of the world are registered in the minute details and musical movements of an organism's body, thereby emphasizing the inherent interconnectedness of body, art, and nature. Shortly after, his speaker shifts from pulsating arteries to another shape of blood, specifically the globules:

> For every Space larger than a red Globule of Mans blood.
>
> Is visionary: and is created by the Hammer of Los
>
> And every Space smaller than a Globule of Mans blood. opens
>
> Into Eternity of which this vegetable Earth is but a shadow[.] (Plate 29: Lines 19-22; E 127)

Once again, the body and world are joined together, as the globule of blood becomes a point of reference that situates the reader and guides them in their comprehension of spaces, either vast or minuscule, of eternity. The parallelism of "every Space" loops back to the blood as an essential part of experiencing elevated and spiritual states brought forward by art, by the hammer of Los. Indeed, the two lines of poetic blood form a frame that emphasizes the creative act. Already, Blake illustrates the flexibility of the concept of blood as a substance that is not simply isolated in the body or limited to the field of natural philosophy. In fact, the association between

pulsation and artery reveals his knowledge of cardiovascular research that stretches back into the seventeenth century. As an example, Herman Boerhaave—a Dutch chemist and teacher—emphasized in the second volume of *Academical Lectures* that "pulsation[s]" and "throbbing motions" are specific to the arteries rather than other vessels in the body (13). When Blake writes the word "pulsation," he almost always adds the term "artery" within the same phrase (E 126, 127), which highlights his precision in rendering the body even as he transforms the concept of blood in new directions. Blood, and other images of the cardiovascular system such as the heart and bosom, are recurring motifs in Blake's visionary world. In fact, the word "blood" and iterations of this term appear over one hundred times across Blake's poetry and prose (Erdman, *Concordance* 233-38). Constantly active and evolving, Blake's imagery of blood takes on multiple shapes both internally in the body and externally along the landscape, as arteries, globules, orbs, streams, and clouds. Depictions of this nutrient-dense fluid extend into the visual counterparts of Blake's poetry, which suggests that he may have been fascinated with the ways in which blood is conceptualized through different media. On the title page of *Jerusalem*, a red hue tints the background and runs through the bodies of the floating hybrid organisms (Copy E, *Blake Archive*). Furthermore, across many of the illustrated plates, Blake saturates the pages with russet-coloured lines, which bring to mind the image of bloody veins and vessels with their small branches and fluctuations. Not only does blood run within and without the body as an interconnective and ecological construct in Blake's work, but Blake illustrates that the redemption of the world heavily relies on the reconceptualization of blood ties and how blood functions in both bodies and the environment. By aligning the lines of artists with bloodlines, Blake foregrounds the communicative and creative function of blood that transcends a single individual, family, or species. In short, blood circulates and connects Blake's characters with

each other and their environments in a way that mirrors the older concept of circulation from physicians such as William Harvey. According to Walter Pagel, circulation did not simply entail the movement of fluids through a system for Harvey, but rather signaled a process of blood regeneration not unlike the heating and cooling stages involved in chemical distillation (23, 25). Through Blake's many forms of blood—both violent and redemptive—he suggests that blood is constantly changing and shaping new relationships as it flows in this ecological way.

Adjacent to the scientific circles of the eighteenth and nineteenth centuries, Blake created and provided engravings for several texts, including a small portrait of Albrecht von Haller for Thomas Henry's *Memoirs of Albert de Haller* (1783). Few scholars have illuminated the fact that Henry describes Haller as the student of Boerhaave, whose works were widely disseminated and translated during the eighteenth century (16). Despite being a mechanist, Boerhaave put forward ideas about chemistry, blood, and furnaces that are arguably central to Blake's work. As Boerhaave outlined in *Elements of Chemistry* (1735), he was against the view that chemistry, through the application of fire and other methods, could simply separate compounds into their original elements. Instead, he believed that chemistry had the power to change and create, and he asserted that "it is evident that the simplicity of the actions of the chemical Art, is no hindrance to their producing an infinite number of different effects" (45). Whether elements were merging together or breaking apart, the results could lead to "surpri[s]ing varieties" (45). He reiterated this point several times for emphasis: "We must not, however, pretend to affirm, that those very parts, into which a Body may have been separated, did really exist in the Body, in the same manner as they appear to us after their separation: [...] since the same powers that disunite these Corpuscles, may produce in them likewise a very great alteration" (46). Indeed, these chemical surprises are akin to the disorienting and unpredictable experience of reading Blake's poetry,

and, more importantly, to the way in which blood is a marker of metamorphosis and change in his oeuvre. On the concept of blood, Boerhaave offered his view that blood gave way to all other fluids in the body as a simultaneously connective yet heterogeneous substance and, beyond that, the particles moved in different ways and at different speeds (*A New Method* 167; *Academical Lectures II*, 168). According to John C. Powers, "[Boerhaave] remarked to his students on the heterogeneous nature of the components of blood produced by chemical distillation, suggesting that one might doubt that these components were present unaltered in the original serum" (113). With these connections between Blake and Boerhaave in mind, I argue that Blake draws on theories from Boerhaave, in addition to other experimenters such as Erasmus Darwin and John Hunter, to formulate a flexible concept of bloodlines before extending this substance beyond its association to the individual body, the biological family or species, and the aristocracy in order to forge a creative figure that acts as a joining factor between bodies. Specifically, I read scenes of what I deem "cardiological discourse" in *The Four Zoas* and *Jerusalem: The Emanation of the Giant Albion*, both of which map the regeneration of a fallen world while being steeped in bodily and anatomical imagery. Beyond that, I suggest that the work of forming these new blood ties unfolds amidst the backdrop of the furnace—an instrument of both artisans and scientists in the long eighteenth century (Morris 6; Hendriksen and Verwaal 392)—such that blood becomes a fluid that is created through collaboration between different individuals and fields. Indeed, Boerhaave included a guide for making five different types of chemical furnaces in *Elements of Chemistry* (508-528). Blake's poetics exudes a chemical undertone, since eighteenth-century chemistry itself, according to Jan Golinski, often crossed boundaries to bring in other sciences such as "heat, pneumatics, and electricity" (7). This new form of blood—with an interdisciplinary drive—crosses boundaries that often separate classes, species, and humans from

each other. Blood becomes an entity that flows through different bodies and environmental spaces, such that it transforms from a biological, individual, religious, revolutionary, and gothic symbol into one that foregrounds ecology as well. Above all, blood is created from and influenced by multiple hands, disciplines, and atmospheres.

**Blake and the Scientific Circle**

Since his work is dense with cardiological images and details, Blake was no stranger to the research on blood that captured the minds of multiple experimenters during the long eighteenth century. In fact, many critics have explored his intimate connection to different scientific branches of his milieu. Through his connection to publisher Joseph Johnson, his participation in the Royal Academy, and his engravings for scientific documents, Blake's immersion in the various physiological discoveries and questions of the long eighteenth century has already been elucidated by scholars such as Denise Gigante, Amanda Jo Goldstein, Stefani Engelstein, and Richard Sha.

For Gigante, Blake's *Jerusalem* draws on the epigenetic theories of his time and expands these ideas to an epic scale in order to emphasize the regeneration of Albion from minute particulars (*Life* 108, 106). Gigante brings to light the different interpretations of vital forces which organize matter, such as that of John Hunter who asserted that blood had life-sustaining powers (*Life* 110). Turning to embryology, Gigante contends that Blake replaces Harvey's pulsating blood and Haller's preformed heart by focusing instead on Wolff's concept of spinal growth (*Life* 145-147). In effect, she claims that Blake's orbs of blood ultimately turn into vital, fiery forces (*Life* 150). While I agree with Gigante's assertion that Blake shifts away from blood onto other anatomical parts and energies, I propose that Blake nonetheless views blood as

flexible material and demonstrates that the cardiovascular system can bring about deep connections between different beings. Taking the connection between Blake and epigenesis in another direction, Goldstein invokes concepts from Erasmus Darwin and Lamarck in order to suggest that Blake's forms of life depart from the organicist ideal, as creatures collaborate within discursive, epistemic, political, and historical contexts (36). Goldstein views Blake's work as a reflection of a different iteration of epigenesis which unfolds on a smaller and more restrictive scale, specifically in terms of "mundane natural-historical time" (43). Therefore, Goldstein suggests that organisms in Blake are situated in between contingency and autonomy, as they both register influences from the environment and change in response to that environment (60). Goldstein briefly touches on blood when discussing Urizen's formation in relation to Harvey's work on embryogenesis using hens' eggs (41). Engelstein brings embryology to the fore by comparing, for instance, scenes in *The [First] Book of Urizen* to images in obstetrical atlases and William Hunter's research while asserting that Blake constructs "a radically different human body ... through a process of regeneration" (79, 72). In Sha's analysis, he claims that Blake's poetic phrases parallel the discoveries of William Cruikshank, who asserted that nerve regeneration stems from the conversion of blood into nerves (130).

Branching away from the astute investigations on literary embryology, epigenesis, and neurology, I instead focus on moments of blood-stained communication in Blake's two texts, with brief references to his other poems, in order to propose a new way of theorizing blood beyond the individual body or history in order to analyze its role in society and the environment. My argument aligns with Steven Goldsmith's in *Blake's Agitation*, in which he proposes that pulsations, whether large or small, extend past the human onto other forms of consciousness (236). Apart from the cardiological figures that appear when characters interact with both

positive and negative instances, Blake's concept of blood flows outward to connect with other forms of circulation, such as that of water or sap, in order to emphasize the overlap between the exteriors and interiors of the body. Ultimately, Blake urges readers to rethink the concept of blood ties such that these become similar to his artistic, "bounding line": "the more distinct, sharp, and wirey the bounding line, the more perfect the work of art" (*Descriptive Catalogue* 63-64; E 550); in constant movement, these bodily, poetic, and visual lines disintegrate and renew in a way that both mirrors and transcends the chemical research of the long eighteenth century.

**Blood Branching into Bosom**

Red, intimate, and vital, blood was central to the imaginations of multiple experimenters throughout the long eighteenth century, including but not limited to William Harvey, Herman Boerhaave, Albrecht von Haller, and John Hunter. Apart from discovering the processes of blood circulation that reformed the previous Galenic system, Harvey declared in *Anatomical Disquisition* (1628) that "the various parts [of the body] are nourished, cherished, quickened by the warmer, more perfect, vaporous, spirituous, and [...] alimentive blood" and afterwards the blood returns to the heart and is "[infused with] natural heat—powerful, fervid, a kind of treasury of life, and is impregnated with spirits" (46-47). His paratactic stream of adjectives come together to cast blood as a substance that changes, heals, and protects whichever part of the body that it comes into contact with. In particular, Harvey specifies that the artery "transmits the digested, perfect, peculiarly nutritive fluid" (47), in a way that resonates with Blake's arteries which pulsate in response to the work of the poet and the events of the world.[1] Boerhaave, too, viewed the movement of the cardiovascular system as essential to life: "so long as the Heart continues its Motion, so long does Life remain" (*Academical Lectures I* 94). The subtle use of

parallelism—"so long"—further emphasizes the fact that blood circulation lengthens and extends one's life. In addition, Boerhaave claimed that blood is "seemingly uniform" yet "is compounded of various and distinct Particles" resulting in differences in "the Course and Velocity in the Vessels" (*Academical Lectures II* 165). Following Boerhaave, his student Haller was fascinated that a heart possesses a specific motion and that it continues to move even when removed from the body (55). Much like Boerhaave, Haller detailed the specific components of blood: "it evidently contains a variety of particles, differing in bulk, weight, figure, and tenacity; some watery, others inflammable" (66). Finally, John Hunter was an experimenter and surgeon who was contemporaneous to Blake. In his *Treatise on the Blood, Inflammation, and Gun-shot Wounds* (1794), Hunter proposed that "Blood is not only alive itself, but is the support of life in every part of the body" and "must have motion" in order to sustain the life of the body (85). Despite the ways in which Blake diverged from more mechanical accounts of the body, such as Boerhaave's metaphor of the heart as a primary machine that supports the hydraulic system (*Academical Lectures I* 94, 80*)*, he shared with many of the aforementioned figures the belief that blood was a multifaceted symbol that conveyed motion, change, creativity, and life. He enfolded blood into his poetry, thereby creating an experimental space to test out and expand the possibilities of this vital fluid. Blake's experiment fits into what Robert Mitchell deems, with a nod to Rheinberger, the importance of generating new questions and ideas through experimentation (*Experimental* 22). As an active substance that Blake constantly invokes when painting—both in literary and visual terms—scenes of interaction and communication, Blake's figure of blood moves along multiple scales with a propensity for destruction and regeneration. In a radical way, blood is alternately the globular Enitharmon (*J,* E 162), blood-stained clouds (*J,* E 204), bloody rivers (*FZ*, E 308), the Divine Vision (*J,* E 214), and the bosoms into which man

can enter as universes of delight (*J,* E 246). At once homogeneous and heterogeneous, blood represents Blake's vision of shared consciousness without forsaking the "minute particulars, every one in their own identity" (Plate 38: Line 23; E 185).

Not only are John Hunter's ideas concerning the body, disease, and medicine present in Blake's works, but his presence as a character is felt in one of Blake's early works titled *An Island in the Moon* (1784). From the perspective of S. Foster Damon, "[the character] Jack Tearguts is the famous surgeon Dr. John Hunter, whose name Blake wrote, then crossed out" (199). Evidenced by the name "Tearguts," Hunter is satirized as a cruel and heartless practitioner in this text. However, any antagonism that Blake may have harboured for Hunter did not prevent him from borrowing scientific terminology and weaving it into his poetic lines. As an example, Carmen S. Kreiter notes that James Basire, the engraver who apprenticed Blake, worked for both John and William Hunter (113), such that John Hunter's dissection of embryos and work on evolution must have influenced the developmental sequence of Urizen and the anatomical depiction of Enitharmon (114, 112). Furthermore, Kreiter argues that Blake's deployment of the word "conglobing" reveals that the poet was aware of the surgical context, specifically operations that involved the heart, in which such terms would be used (114). In a similar way, Gigante asserts that Blake brings forward John Hunter's idea that blood promotes life (*Life* 110). Revisiting Hunter's *Treatise* from a different angle, I suggest that Blake also incorporated other aspects of Hunter's research on blood into his writing of *Jerusalem*. One crucial point is Hunter's claim that "we can hardly procure blood in the same state twice from one person" (13). Even in a single individual's body, blood always indexes the larger context, situation, and condition that this organism is experiencing. Such is true for Enitharmon, who divides from her counterpart Los twice in *Jerusalem*, yet the sequence, though repeated, is different in its invocation of blood

globules in each instance. Toward the beginning of *Jerusalem*, Enitharmon "divided away / In gnawing pain from Los's bosom in the deadly Night; First as a red Globe of blood trembling beneath his bosom" (Plate 17: Lines 49-51; E 162) before this "Trembling Globe shot forth Self-living & Los howld over it: Feeding it with his groans & tears day & night without ceasing:" (Line 55). Gruesome, painful, and grotesque, this scene bursts with discomforting and visceral imagery such as the "gnawing pain," the continuous "trembling," and the howls, groans, and tears. Although the division is addressed in the first line, the reader views the bloody interaction between Los and Enitharmon at each moment, as she transforms from a globe of blood attached to him into one that detaches completely from him yet still stimulates his emotional response, the feeding that joins them together. The continuous, shaking echo of "trembling" shows that the blood never ceases to move and this is not a final division. However, Enitharmon's second departure from Los is arguably more hopeful, as she "like a faint rainbow waved before him" before turning "Into a Globe of blood beneath his bosom trembling in darkness" (Plate 86: Lines 50 and 52; E 245). Again, Los "fed it, with tears & bitter groans / Hiding his Spectre in invisibility from the timorous Shade / Till it became a separated cloud of beauty grace & love" (Lines 53-55). Blake's speaker employs both simile and metaphor to link Enitharmon—still a globe of blood—to atmospheric phenomena such as the rainbow and cloud, as the minute depths of the body intertwine with the surrounding air. With fewer instances of punctuation and more fluid enjambment, these lines bring forward a positive tone which reveals that their separation nonetheless inspires "beauty grace & love." It is as if with each bloody encounter, Blake's characters are one step closer to experiencing feelings of fellowship, empathy, and understanding. In both scenes of bloody division, blood goes beyond a single individual's system and reflects Hunter's assertion that blood incorporates foreign materials from outside the body

into its flow and fabric (15). In both, Enitharmon is metaphorized as a "globe" of blood. This particle is situated between the globule and the world, at once self and other, and brings the individual's blood closer to the environment of which one is always a part.

One word that often recurs in tandem with Blake's imagery of blood is the term "bosom." Aside from Biblical and religious connotations that inspire readings of intimacy, forgiveness, and protection, both "blood" and "bosom" connote forms of communication with and connection to other bodies and emotions, according to the *Oxford English Dictionary* ("blood, n." and "bosom, n."). Indeed, the term "bosom" is alliteratively and anatomically in tune with "blood." Blake extends the creative potential and energy of the blood to the bosom which, apart from suggesting the chest or womb, conveys a surface that brings to mind the act of embracing and can be used to describe humans, nonhumans, and environments ("bosom, n."). This iteration of bosom resonates with Merleau-Ponty's flesh or "the synergy that exists among different organisms" (142). Indeed, Merleau-Ponty, using chemical terminology, defines flesh as an "element" or that which is "midway between the spatio-temporal individual and the idea" (139). For Blake, blood circulation is not isolated in the individual body, but affects the surface and textures as well as social interactions in both positive and negative directions. The bosom is reworked as a porous space of communication that may either divide individuals or catalyze the formation of deep relationships. A fast-paced sequence in *The Four Zoas* illustrates this point on "bosom" interchange:

> [Urthona] dropd his hammer. dividing from his aking bosom fled
> A portion of his life shrieking upon the wind [Enitharmon] fled
> And Tharmas took her in pitying Then Enion in jealous fear

Murderd her & hid her in her bosom embalming her for fear[.] (Page 22: Lines 20-23; E 312)

In a few short lines, the reader grasps the circulation of characters and emotions that runs through several bosoms and recalls the movement of blood from scenes in *Jerusalem*. As Enitharmon flees from Urthona's bosom, he feels the ache similar to the pain of Los in the previous example. The similar trochaic rhythm of "aking" and "shrieking" intertwines his pain with her voice, both of which are connected to the space of the bosom. Much like a sanctuary, Tharmas offers Enitharmon his bosom before Enion tears her away. The double repetition of "fled" and "fear," alongside their alliterative tone, brings forward the feeling of the heartbeat that quickens in response to these alternately kind and horrific interactions. Similar to the previous instance of Enitharmon's departure from Los, here there is an oscillation between fear and hope, between destruction and redemption.

However, regeneration does ultimately depend on the bosom and the circulation of blood that it images forth. When Los offers to share his fibres with Enitharmon in *Jerusalem*, he states that "When in Eternity Man converses with Man they enter / Into each others Bosom (which are Universes of delight) / In mutual interchange" (Plate 88: Lines 3-5; E 246). He reveals that conversation—a reciprocal exchange—changes the body of each speaker, enables a form of porous interaction, and creates deep blood ties between individuals beyond the normal limits of biological inheritance. With the alliteration of "man" and "mutual," there is a sense that people are flowing toward each other and affecting each other much like shared pulses or heartbeats that remain in sync. The parentheses, which align the bosom with expansive universes of delight, illustrates that although the bosom appears limited to the interiors of an individual's body like the two crescent marks, the body and blood gesture outward to reflect the larger environmental

surrounds. In time, new bloodlines will branch out toward both human and nonhuman others. Elsewhere, Blake writes that "the Divine- / Humanity, who is the Only General and Universal Form / To which all Lineaments tend toward love and sympathy" (Plate 38: Line 19-21; E 185). These lineaments could very well include bloodlines, as the definition of "lineaments" involves both lines for sketches and the body ("lineament, n."). To return to the writings of Boerhaave, he stated that "the Particles of the Blood are continually attracting each other [...] which is an Affection not common to all Fluids, but only particular to the Blood, and some others" (*Academical Lectures I* 89-90). Although Boerhaave likely used the term "affection" to designate the physical forces in the blood, the secondary connotation of care and fondness shines through. Through their regenerative cycles, these particles of blood are ensuring greater harmony between different individuals. The potential for intimate connections through circulation goes beyond the characters and extends to nonhuman, environmental forms:

> [...] Rivers Mountains Cities Villages,
> All are Human & when you enter into their Bosoms you walk
> In Heavens & Earths; as in your own Bosom you bear your Heaven
> And Earth, & all you behold, tho it appears Without it is Within
> In your Imagination of which this World of Mortality is but a Shadow. (Plate 71: Lines 15-19; E 225)

From nonhuman aspects of nature to manmade spaces, there are no caesurae to separate these entities as everything becomes connected through the bosom. With the parallelism, there is a link between entering into the bosoms of these environments and knowing one's own bosom, as the self overlaps with world and what is "Without ... is Within." Expanding the bosom into a cosmological vision of heavens and earths rings true to Harvey's analogy between the circulatory

system and the larger celestial cycles in space, as he deemed the heart "the sun of the microcosm, even as the sun in turn might well be designated the heart of the world" (47). All of these interactions coalesce in the imagination which illustrates the fact that these new bloodlines are not only bio-ecological and social, but are fundamentally poetic and artistic in nature. Through the metaphor of the world as the shadow of the imagination, Blake reminds readers that the world, with its materials and bodies, can never be severed entirely from the creations of the mind and imagination, as shadows remain attached to their more physical counterparts.

**Blood Within, Blood Without**

Blake follows in the footsteps of experiments from William Harvey to Erasmus Darwin, since the flow of blood was often seen as connected to larger circulatory systems, such that the cardiovascular system within the body mirrored the general movement of fluids around the earth and across space. With a nod to Aristotle, Harvey wrote that the motion of blood is "circular, in the same way that Aristotle says that air and rain emulate the circular motion of superior bodies" (46). There is a thread that links together body, earth, and sky. In particular, Harvey believed that blood reflected the water cycle with phases of evaporation, condensation, and rainfall (46), which, as Pagel has pointed out, resemble the processes of heating and cooling that epitomize chemical and alchemical distillation (23). These concepts made their way to Erasmus Darwin and he conveyed them in *The Botanic Garden*, a text that contained several plates which Blake had engraved (Bentley Jr. 546-47). Darwin compares blood circulation to the flow of water in *Economy of Vegetation*, as "from the heart the sanguine stream distils" and sends the blood to all parts of the body before the "vagrant globules swim / From each fair feature, and proportion'd limb, / Join'd in one trunk with deeper tint return" (Canto III, Lines 47, 53-55).Vagrant globules,

swimming freely through enjambment, reunite with the caesura that joins them together into one trunk or vessel, which in turn exudes a deeper hue due to the combination of different particles. For Blake, this orderliness transforms into the erratic intermingling of bodily blood with larger circulatory systems in *The [First] Book of Urizen*. Here, "vast clouds of blood roll'd / Round the dim rocks of Urizen" (Plate 3: Lines 41-42; E 71) before "The roaring fires ran o'er the heav'ns / In whirlwinds & cataracts of blood" (Plate 5: Lines 12-13; E 73) and "thousands of rivers in veins / Of blood pour down the mountains" (Plate 5: Lines 30-31; E 73). Saturating and tainting both water and air, the imagery of blood spins and falls with frenzied diction such as "roll'd," "round," "whirlwinds," and "pour." Lost is the predictable, hydraulic system that sends the blood from heart to veins and back again. Instead, Blake emphasizes that circulation—taking place within the body and around the environment—is unpredictable and multidirectional, unlike Harvey's view of blood circulation as moving in a single direction with "valves" that will "readily open in the right direction [but] entirely prevent all such contrary motion" (64).

Beyond that, this concept of porous blood not only becomes imbued in atmosphere, but is also reflected in the growth of plants. Many experimenters such as Harvey, Haller, Hunter, and Darwin employed terminology—such as "blood," "twigs," "branches," "vessels," and "trunks"—that bridged the gap between animal blood and the fluids found in different plants and trees.[2] Blake's polypus—a recurring figure of destructive and unrestrained energy—is a pertinent example of overlapping bodies and natures. Many scholars have linked the polypus to theories of spontaneous generation in the eighteenth century. According to Engelstein, Blake's polypus gestures toward Abraham Trembley's research on the regenerative, moving hydra—neither fully animal nor plant—that could begin to reproduce anywhere along its body and thus typified a creative force that undergirded conceptualizations of epigenesis (91-92). Engelstein notes that

both Urizen and the polypus represent the dangers of ossification and nonorganized proliferation, as these two extremes are cast in a negative light in Blake's vision (100, 101). In a more recuperative reading, Gigante asserts one could also interpret this figure as an index of hope for transformation and a sign of revolutionary change through its connection to Orc in *Milton* (*Life* 129). However, there is a third way of construing this hybrid creature by referring to Boerhaave's *Aphorisms*, in which he warned readers that, if the blood vessels became too stiff, a polypus would grow and harden until it chokes the individual's circulation (14). Indeed, the Oxford English Dictionary asserts that the polypus was one of the factors involved in cardiovascular disease ("polypus, n."). Reflecting this older definition of polypus, Blake's creature constricts the circulatory system, such as when a mighty polypus emerges from Hand's bosom after he absorbs Albion's twelve sons (E 163); the creature becomes a marker of hindered communication as the bosom, or heart, transforms into a locus of violence. Furthermore, Blake's polypus is metaphorized as a tree that the Daughters of Albion terrorize: "Becoming / A mighty Polypus nam'd Albions Tree: they tie the Veins / And Nerves into two knots: & the Seed into a double knot:" (Plate 65: Lines 47-49; E 219). It is as if the flow of blood, which inspires communication and renewal, is interrupted with the repetitive action of tying and knotting. In the following lines, everything shrinks, from the sun to the heavens and trees (E 219). Because this creature blocks the cardiovascular system, it in turn inhibits environmental growth at large, as blood is needed for communication in Blake's world.

At other times, Blake's alignment between body and plant illustrates the extension of bodily terms to nature and the environment in more generative ways. Turning again to Darwin, he emphasized the way in which blood runs through the systems of different plants: "in bright veins the silvery sap ascends, / And refluent red blood in milky eddies bends" (Canto IV, 419-

420). Just as veins and vessels are visible along the human body, Darwin paints a vivid portrait of lines along the plant with his use of colourful diction: bright, silver, and red. Indeed, Darwin continued this analogy in his notes, specifically in a section titled "Vegetable Circulation." For instance, he claimed that plants have "Arterial systems to convey the fluid [...] to the various glands of the vegetable for the purposes of its growth, nutrition, and various secretions" (98). Furthermore, when describing the fig-leaves and picris used in his experiment, he explained that "their blood is white" (99). In *The [First] Book of Urizen*, Enitharmon's birth constitutes a scene where the boundaries between the blood of animals and the sap in plant is blurred:

> The globe of life blood trembled
> Branching out into roots;
> Fib'rous, writhing upon the winds;
> Fibres of blood, milk and tears[.] (Plate 18: Lines 1-4; E 78).

With each moment—trembling, branching, and writhing—the globe of blood blends together animal and plant physiology as it grows roots, fibres, blood, milk, and tears. Here, milk may not only refer to the nutritive fluid produced by animals to nurse their young, but also the "milky juice" which is a phrase that Darwin uses to describe sap circulation in the two aforementioned plants (99). To test the circulation within their leaves, Darwin soaked the plants in red material. After he cut their stalks the next day, he found that "an internal circle of red points had appeared, which were the ends of absorbent vessels coloured red with the decoction, while an external ring of arteries was seen to bleed out hastily a milky juice, and at once evinced both the absorbent and arterial system" (99).[3] Darwin's experiment brings to mind Blake's illustrated title page for *Jerusalem*, where the figures are hybrids with red-toned vessels running through their bodies (Copy E, *Blake Archive*) as well as the final illustrated plate to *Milton* where two plant-like

humans display red lines branching upward (Copy D, *Blake Archive*). For both Blake and Darwin, blood does not solely reside within the walls of the human or animal body.

Whether in the form of blood-stained clouds, rivers, air, or earth, blood transcends the body and is projected onto the atmospheres and landscapes in Blake's texts. Many instances of externalized blood imply danger, destruction, and apocalypse while signaling the presence of wounded bodies. Lamenting the fall of Albion, the initial speaker of *Jerusalem* exclaims in despair: "Albions mountains run with blood, the cries of war & of tumult / Resound into the unbounded night, every Human perfection / Of mountain & river & city, are small & wither'd & darken'd" (Plate 5: Lines 6-8; E 147). Chaos permeates the scene. As blood runs down the mountains, there are cries that echo in the air, and every environment shrivels and shrinks. Here, the flow of blood is a sign of blood loss in particular. A similar sequence unfolds in the short poem "London," where blood intersects with the cries of the soldier: "And the hapless Soldiers sigh / Runs in blood down Palace walls" (Lines 11-12; E 27). Blood runs and escapes from the body in ways that reveal the suffering and sighs of the soldier. According to E. P. Thompson, "the blood of the soldier is for real, as well as apocalyptic" (*Witness* 186). Blood not only runs down mountains and palaces, but occupies a more atmospheric register as well. In a similar light, the speaker of *Jerusalem* expresses: "the bitter pangs of love forsaken / Across Europe; across Africa; in howlings & deadly War / A sheet & veil & curtain of blood is let down from Heaven" (Plate 68: Lines 20-21; E 221). With each additional noun—"sheet," "veil," and "curtain"—the shower of blood thickens and coagulates, such that it becomes almost suffocating. Situated in a tripartite frame of meanings, these environmental iterations of blood often bring to mind war, sacrifice, and religious omens. In particular, with the political upheaval unfolding around the end of the eighteenth century, the metaphor of blood was dominant in the social imagination of this

period. As Saree Makdisi has shown, writers who considered the political consequences of the French Revolution—dense with riots and violence—often turned to the word "bloody" to describe the events at hand (49, 50).

However, I put forward the possibility that Blake's blood-stained landscapes are also connected to observations and research, beginning at the end of eighteenth century, of the phenomena of blood rain. According to the *Oxford English Dictionary*, blood rain originates from particles such as dust and algae that float in the atmosphere ("blood rain, n."). Blood—here used as a metaphor—illuminates the tendency to connect larger, environmental phenomena to the red interiors of the body. Darwin's work is helpful for contextualization, as he describes Dr. Sterling's observations in a footnote to *Loves of the Plants*, which specifies that Sterling, from his position in Detroit, viewed a blood-red sun and dust dropping from the sky in 1762, and he assumed that these environmental wonders originated from either an earthquake or volcanic eruption (p. 167).[4] These phenomena persisted in the early nineteenth century, as Italian researcher Giuseppe Maria Giovene saw red rain and fog in Italy during March 1803; he believed that it was due to the circulation of sand from Africa rather than from various volcanoes (299, 300). C. G. Ehrenberg's research goes one step further, as he asserted that there were multiple microorganisms, both freshwater and continental, in samples of blood rain (27). Therefore, blood rain involves the presence of other organisms and particles that circulate within the atmosphere and various bodies, in a way that reflects Jane Bennett's concept of nonhuman "actants" that place pressure on human bodies through their vitality (94). There are two readings at play concerning Blake's scenes of violent blood loss. These instances are not solely symbols of pride, violence, and restrictive systems but are also markers of interconnection between

humans, nonhumans, and global environments which are indexed through the appearance of bloody environmental forms.

Walking around Golgonooza, the city of art, Los observes that "For every thing exists & not one sigh nor smile nor tear, / One hair nor particle of dust, not one can pass away" (Plate 13-14: Lines 66 and 1; E 158). Exhalations, expressions, tears, bodily fragments, and dust particles persist in the cycle of life and are renewed in this city. Dust is a key figure here and elsewhere, for soon the living creatures, who labour at the plow, cry out: "Let the Indefinite be explored. and let every Man be judged / By his own Works, Let all Indefinites be thrown into Demonstrations / To be pounded to dust & melted in the Furnaces of Affliction" (Plate 55: Lines 58-60; E 205). Everything that withers and turns into dust has the potential to flourish into a new identity in the furnaces. Taken together, Blake's environmental depictions of blood emphasize the fact that the blood outside, just like the blood within, consists of multiple dust-like particles that flow, interact, and jostle with one another, such that different individuals and spaces are ultimately intermeshed in a web or rhizome of unexpected relationships. Moments of blood raining down from the sky make visible the interconnections between humans, nonhumans, and environments that are so often ignored due to the seemingly homogeneous appearance of air or water. Gathered together, the sand, dust, and microorganisms emphasize a social way of being that is communicated through the metaphor of blood which reflects the connection between the exteriors and interiors of the body. Blake's literary and visual experiments on blood cannot unfold without one crucial instrument: the furnace.

**Surrounded by Fire and Furnace**

As an interdisciplinary instrument, furnaces were prevalent in the spaces of artists, artisans, and scientists throughout history, as they housed fires that inspired creative work, experimentation, and exploration. According to Hendriksen and Verwaal, during the early modern period, furnaces "could be part of artisanal workshops or alchemical laboratories, or both at the same time" (392). These two researchers recreated Boerhaave's little furnace, which he used for chemical experiments, and asserted that "chemical instruments were rarely remarkably beautiful, often made from reusable materials, and built for temporary use" (387). Not only was the furnace able to test everyday materials, but Boerhaave also "introduced his furnace to his students when he started giving private lectures in chemistry from 1702 onwards" such that they could "experiment for themselves" (391, 392). Furnaces appear time and time again in Blake's texts, often to signal the movement and work of the characters as they attempt to redeem the world using art. Although these furnaces are grand and expansive spaces in contrast to Boerhaave's smaller furnace, Blake nonetheless depicts the furnace as a site of collaboration that emphasizes the creative potential of each body. Los, with "the red Globe of fire in [his] hand, / [...] walks from Furnace to Furnace directing the Labourers" (Plate 85: Lines 19-20; E 244) while singing a song for Jerusalem. The globe of fire brings to mind the globe of blood, such that the body intersects with art, chemistry, and change. Soon after, Los himself begins to work: "He siezes his Hammer every hour, flames surround him as / He beats" (Plate 86: Lines 34-35; E 245). The fire from his hand now envelops him completely as he becomes absorbed in the work of forging new bodies, bloodlines, and worlds. Northrop Frye makes an astute summary of Los's creative endeavours: "the hammer is the heart-beat, the bellows the lungs, and the furnace is the metabolism of the warm-blooded animal" (*Fearful Symmetry* 253). The presence of fire is crucial to this project of redemption and regeneration. On the topic of Boerhaave, John C. Powers

asserts that fires were seen as being essential to producing new effects and outcomes in chemistry (149). On the frontispiece of *Jerusalem*, Los enters a door with a circle of glowing light at his hand. For Denise Gigante, Los's disk of fire eventually transforms into "a three-dimensional globe of vital—indeed vitalist—power" (151), whereas Steven Goldsmith suggests that Los uses this fiery instrument to challenge the existing systems of law (44). I take the interpretation in another direction and suggest that this illustration aligns with the moment when "Los took his globe of fire to search the interiors of Albions / Bosom, in all the terrors of friendship" (Plate 45: Lines 3-4; E 194), in hopes of creating new bloodlines with the fiery powers of the furnace, a space that interweaves humans, nonhumans, and art, such that friendship will no longer produce feelings of terror. Indeed, Blake spatializes the bosom with gates, such as the "Inner gates of Enitharmons bosom" (Page 22: Line 2; E 313), in order to demonstrate that this locus allows for meetings between different forms of consciousness.

As the body becomes aligned with the furnace, Blake illustrates the ways in which existing relationships break down such that news ones may form. In doing so, he reveals that the body—as a constantly changing space—is constructed and reconstructed, built and rebuilt, at each moment. Here is a point where Blake and Boerhaave diverge: while Boerhaave saw the body as a hydraulic machine consisting of solid and fluid parts (*Academical Lectures I* 80, 85), Blake transforms the body into an architectural space, as Golgonooza, the city of art, is a collaborative effort that stems from an unpredictable system. Blake draws on Boerhaave's concept of the mechanical body, with its "Pillars, Props, Cross-Beams, Fences, Coverings, [...] Bellows; and others like Sieves, Strainers, Pipes" (81), and reshapes these parts by emphasizing the "Labour of merciful hands: the beams & rafters are forgiveness: / The mortar & cement of the work, tears of honesty" (Plate 12: Lines 32-33; E 155). Each part of this city is imbued with

care and emotion, specifically the feelings of the workers themselves. Using an ellipsis, Blake eclipses the verb in the second line to further close distance between an artist's creation and their bodily response. To position this city within the body, Blake writes that "Los builded Golgonooza, / Outside of the Gates of the Human Heart," (Plate 53: Lines 15-16; E 203), which suggests that this is a city without clear boundaries that stretches outward to affect the larger circulation system. Furthermore, Blake's use of "gates" is crucial, as Harvey compared the valves within blood vessels to "floodgates" and "gate-keepers" because they kept the blood flowing in one direction (*Anatomical Disquisition* 64, 79). Even when the mourners weep in *Jerusalem* as the heart closes its gates (E 197), elsewhere Blake reveals that these gates can open again: "Albion fled thro' the Gate of Los, and he stood in the Gate" (Plate 35: Line 11; E 181). These gates serve as points of contact between the different characters without enforcing unidirectional or fixed patterns of movements and relations. This flexibility extends to other parts of the body as well. When London laments that he is separated from his "nervous form" as "[his] vegetating blood in veiny pipes, / Rolls dreadful thro' the Furnaces of Los" (Plate 34: Lines 35-37; E 180), there is an implication that these pipes are not fixed in their movement, but will instead roll through the furnaces and give way to new connections within the blood. Indeed, at another moment, "the vessels of [Los's] blood / Dart forth upon the wind in pipes writhing about in the Abyss" (Page 111: Lines 26-27; E 383). The shift from rolling to erratic writhing illustrates that the pipes in Blake's vision are continuously refashioned in the furnaces and rendered more flexible.

Returning to the interaction between Los and Enitharmon amidst the furnaces, here Los attempts to repair their separation toward the end of *Jerusalem*:

[...] my wild fibres shoot in veins

> Of blood thro all my nervous limbs. soon overgrown in roots
> I shall be closed from thy sight. sieze therefore in thy hand
> The small fibres as they shoot around me draw out in pity
> And let them run on the winds of thy bosom: I will fix them
> With pulsations. (Plate 87: Lines 5-10; E 246)

The erratic movement of blood through these enjambed lines culminates in Los's proposal to Enitharmon, as he extends his bloodlines to her hand, the organ that can register and feel the beats and pulsations of another person's circulation. In turn, their bosoms would reunite as the circulation of blood crosses between their bodies to remedy their previous division (E 245). When she rejects his words, Los sighs "like the Bellows of his Furnaces[,]" and gestures to his hammer while exclaiming to Enitharmon that "When in Eternity Man converses with Man they enter / Into each others Bosom (which are Universes of delight) / In mutual interchange" (Plate 88, Lines 1, 3-5; E 246). Los refers to the bellows and the hammer, tools which work in tandem with the furnace, in order to reassure the audience that there will be more compassion and understanding between bodies in eternity. In short, he knows that the furnace will help them repair and forge new blood ties in the end. Indeed, in one of the final scenes, "Albion spoke & threw himself into the Furnaces of affliction" before the fires burst and all the characters arise in "Albions Bosom" (Plate 96: Line 35 and 42; E 256). In his chemical experiment of blood within the furnaces of the poet, Blake illustrates that bodily circulation gives way to renewal not only within one body's history, but between different bodies. To further emphasize the interconnections of all beings, *Jerusalem* concludes with the speaker's declaration that "All Human Forms identified even Tree Metal Earth & Stone" spend their time "reposing / And then Awaking into his Bosom in the Life of Immortality" (Plate 99: Lines 1, 3-4; E 258). Trees,

metals, earth, and stones—which are the basic materials of the chemical arts—come to the fore to show that circulation moves through various systems beyond the body. Amidst the backdrop of the furnaces, Blake reveals that separation and regeneration, much like reposing and awaking, are both necessary to the reanimation of the world. Everything comes together—blood, bosom, furnace, and all the creatures of the environment—in this final, expansive scene.

**Conclusion**

Bringing research on blood from the long eighteenth century into his literary space, Blake's chemical, communicative, and transformative concept of blood—which flows through bodies, landscapes, and the furnaces in its various shapes—is arguably the basis of both destructive and redemptive relationships between the characters and environments. Drawing blood away from one individual, history, or species, Blake's work epitomizes a way of imagining blood through an ecological lens that prompts cross-pollination between humans and nonhumans, while allowing readers to access this new concept through the relatively mundane figure of the furnace, a locus of warmth, creativity, and reformation. Above all, Blake not only bridges the gap between humans and their nonhuman counterparts, but also brings together different disciplines such as art and science through the figure of the furnace, which reflects the cultural porosity between various fields that only began to diverge in the nineteenth and twentieth centuries.[5] These interconnective bloodlines are also found in the works of both Percy Bysshe Shelley and John Keats, who, as I argue in the next chapter, turn to concepts of sap circulation and blood transfusion to mark the flow of blood across space and time in a way that emphasizes the centrality of readers and reading.

# Notes

1. For a more detailed account of how Harvey influenced multiple researchers that followed in his footsteps, see Robert G. Frank Jr.'s *Harvey and the Oxford Physiologists: Scientific Ideas and Social Interaction* (1980).

2. To provide just a few examples, Harvey used phrases such as "the trunks into the branches of the veins" and "from the branches toward the trunks and roots" (*Anatomical Disquisition* 63, 64), Haller explained that "From the trunks of all the arteries branches are sent forth, and from these again proceed lesser twigs by numerous division" (*First Lines* 16), Hunter noted the "branches" and "trunk" of the vessels in a patient in St. George's Hospital (*Treatise* 66), and Darwin not only describes the arterial system of plants with vessels, but also gestures toward an experiment performed by Stephen Hales, where the latter observed sap rising before "it ceased to bleed at all" ("Additional Notes" 98, 96).

3. In *The Botanic Garden*, Darwin provides a full description of sap circulation within a leaf: "There is then a complete circulation in the leaf, a pulmonary vein receiving the blood from the extremities of each artery on the upper side of the leaf, and joining again in the footstalk of the leaf. These veins produce so many arteries, or aortas, which disperse the new blood over the new bark, elongating its vessels, or producing its secretions" ("Additional Notes" 100).

4. For the full account from Dr. Sterling's letter, see "An Account of a Remarkable Darkness at Detroit" in the *Philosophical Transactions*, vol. 53 (1763).

5. Jan Golinski, who references the work of Steven Shapin, Simon Schaffer, and Bruno Latour, emphasizes that beginning from the seventeenth century, science was spread from laboratories into public spaces in specific, local ways, through demonstrations, correspondence, and academic journals (3, 4). The demonstrations tended to differ depending on the practitioner. For instance, Joseph Priestley conveyed his chemical theories through both demonstrations and written texts whereas Humphry Davy intended for his audience to watch and absorb his lectures in a more passive manner (8, 9). On the other hand, C. P. Snow notes that in the twentieth century, a gulf began to expand the distance between scientists and non-scientists or literary intellectuals, a gulf steeped in miscomprehension and lack of understanding (16, 4).

# Chapter Two

Blood Across Space, Species, and Time: Extensive Circulation and Transfusion in the Poetry of Percy Bysshe Shelley and John Keats

## Introduction

Attending to social blood ties in Blake's poetry and visual art is a way to perceive the vital relationships among humans, nonhumans and the environment: "reading blood" allows for a beneficial interweaving of different consciousnesses. Blake is not the only Romantic writer who brings blood to the foreground of his literary work, as Percy Bysshe Shelley and John Keats—both of whom were steeped in the scientific discussions of their time—also draw on the ways in which blood escapes the human body to form new ways of contact. While Shelley was inspired by figures such as Dr. Adam Walker, "a science enthusiast and inventor [who] gave a series of talks and demonstrations covering many scientific topics [at Syon House]" (Bieri 78), Keats "was apprenticed for five years to Thomas Hammond of Edmonton, the apothecary-surgeon" and received his certificate in 1816 before beginning "a comprehensive course of medical training" at Guy's Hospital (Goellnicht 16, 23). Literary scholars have often focused on the solipsism and singularity of Shelleyan figures such as the poet of "Alastor," the sensitive plant, and the lady of the garden, yet I argue that all three characters are markers of relationality, since they are intertwined in forms of circulation that exceed human boundaries and that enfold other humans and nonhumans into the channels of their blood. In particular, as I have already elucidated in the previous chapter, experimenters of the long eighteenth century believed that there was significant overlap between animal or human bodies and the structures of plants, a concept that dominated the minds of Harvey, Boerhaave, Darwin, Hunter, and especially Stephen Hales. Although Shelley's three characters appear singular at first glance, he subtly demonstrates, through the use

of circulatory images, that they are intimately connected to the environments that surround them. The wandering poet of "Alastor" cannot deny his own bodily responses to nature even as he moves and seeks more ideal forms of existence. In "The Sensitive Plant," when the lady perishes, her passing deeply affects the plant's own circulation until it too withers away, as if a vessel had ruptured in the circulatory system of which they are both a part. On the other hand, Keats moves in another direction with his social concept of blood, traversing not only space, but also time to reach the readers of different periods. Here, it remains vital that the living hand, and its speaker, requests a transfusion of blood from the reader, not only as a reflection of Keats's interdisciplinary knowledge, but as a commentary on the meaning behind blood transfusions that were common during the long eighteenth century. I draw on the work of Richard Lower and his transfusion of blood from a sheep to his patient Arthur Coga. Lower hoped that the pure qualities of the sheep will cure the latter. Bringing this scientific context together with the short poem, I argue that Keats views the reader as essential to the speaker's health and well-being, and the demanding tone of the speaker subtly evinces an elevation of the reader to the status of a healer. I will end by illustrating the way in which the "hand" can signify the poem itself, such that the speaker hopes the reader will revitalize and reinvigorate the poem in the future by reading it. For both Shelley and Keats, in addition to Blake and Mary Shelley, no individual can exist in a vacuum as their circulatory systems produce particles and art, while they in turn absorb the atmospheres of their environments. Blood becomes an index of relationships that extend past the self onto others, across different spaces and temporalities.

**Growing New Blood Lines**

Despite the fact that Shelley's "Alastor" has sparked the critical interest of multiple scholars, few have addressed the cardiological imagery that flickers throughout this poem, which is understandable since, compared to Blake's poems from the previous chapter, Shelley employs these terms more sparsely here.[1] One exception is Sharon Ruston's *Shelley and Vitality*, where she discusses the fact that both John Hunter and Adam Walker viewed blood as a substance that reflected the living principle and Ruston shows that this is brought to bear in Shelley's poetry, such as in the vampirism of Panthea or the fibres of the Earth in *Prometheus Unbound* (107, 114, 121). However, when "Alastor" has been the focus of analyses, critics often turn to emphasize the political and psychological aspects of Shelley's poem instead. For instance, Cian Duffy writes that the poet's political potential is wasted because he remains an unsocialized individual who engages in a self-regarding response to the natural sublime at the expense of social sympathy available through the Arabian maiden; after he dreams of the maiden, he wakes up to regard nature in egoistic and anthropomorphic terms (80, 81, 82). William Keach makes a similar point, as he asserts that the poet's mind "[invests] nature with its own reflexive activity" and the meeting with the maiden becomes a "self-enclosed psychical experience" (83, 82), devoid of any true social interaction. To push this analysis further, Maureen N. McLane notes that the poet's world is one "of pure consciousness, with room enough for one and one only" and "His fantasy-girl, who appears fast on the heels of the disappointed Arabian maid, is the guarantee of a non-reproductive eros, a sympathy always already mastered and orchestrated by and for the self" (191). Shifting away from critics who view the dream vision as a solipsistic retreat or erotic entanglement, I reread the central encounter with the "veilèd maid" (Shelley 150) as an engagement with outer influences that intermingle with the poet's own body and imagination. Despite the fact that the poet is dreaming, this vision is "a dream of hopes that

never yet / Had flushed his cheek" (149-150). The initial description already locates the dream in the poet's physical body, specifically in the redness of his cheek that suggests a rush of blood moving through his system. As the maiden moves from speaking to singing to embracing the poet, the moment is a deeply physical and creative instance that is registered in the interior parts of the poet's body and ultimately produces shared veins:

> ...her fair hands
> Were bare alone, sweeping from some strange harp
> Strange symphony, and in their branching veins
> The eloquent blood told an ineffable tale.
> The beating of her heart was heard to fill
> The pauses of her music[.] (165-170)

At first glance, the alliteration of "sweeping," "strange," and "symphony" produces a sense that her hands and voice are swirling and circulating together with the harp, such that her verse branches out in the form of blood vessels along her body and her instrument. With the appearance of this new blood that has branched out from her creation of art, the strangeness of the song transforms into one of eloquence where words remain secondary—"ineffable"—to bodily expressions. Different parts of her circulatory system participate in this song, as her heart beats alternatively with her music and provides harmony to the song by filling the pauses. Here, Shelley invokes cardiological research of his time in order to illustrate that blood has a communicative function with its ability to tell a tale and its central role in artistic experiences. Indeed, both the colour and pulsations of blood signal the health and condition of an individual's body; they tell a story to the physician who listens and observes. For instance, John Hunter asserted that "we find that these [red] globules are of different hues in the different systems of

vessels in the same animal" and he specified that while arterial blood is scarlet, venous blood is modena (50). Furthermore, if blood were exposed to air, its surface would become a "bright scarlet colour" whereas the hidden parts are "black" until they themselves are exposed to air (Boerhaave, *Elements* 292). As an example of blood's reflection of and connection to bodily health, John Keats, after coughing up blood and inspecting "a single drop of blood upon the sheet[,]" lamented to his friend Charles A. Brown: "I know the colour of that blood; it is arterial blood; I cannot be deceived in that colour; that drop of blood is my death-warrant" (Brown 64).[2] The same revelatory quality exists with pulses and pulsations. Haller indicated that one could read the pulse as slow, hard, fast, or quick (78). With these details in mind, it becomes clear that there is a social energy to the maiden's blood as she engages in this performance.

Yet, there is another way of reading the plural "their," one that involves the poet's blood and body, which was first alluded to when the narrator drew attention to his flushed cheek. If the phrase "their branching veins" includes the poet's circulatory system, then the song arises from both performer and observer and draws the two into an intimate relationship, which foreshadows their later moment of union. In short, the art creates new bloodlines along their bodies that branch outward and reflect Merleau-Ponty's concept of shared and dynamic flesh between bodies (142). Hunter detailed the growth of new blood vessels—what is now termed angiogenesis—in his *Treatise on Blood*.[3] Although researchers such as Hall and Folkman assert that Hunter was one of the first figures to use this word, Lenzi et al. claim that Hunter's texts reveal no such word but do describe the ways in which blood vessels are repaired (Hall 95; Folkman 1; Lenzi et al. 256). Specifically, Hunter noted that when the body is wounded, the blood takes certain steps to refresh and revitalize itself, "but in what way [the vessel] inosculates, whether by the two orifices when opposed having a mutual attraction, and instead of contracting

the two portions of the ruptured vessel elongating, so as to approach each other reciprocally and unite; or whether a new piece of vessel is formed in the intermediate coagulable lymph, is not easily determined" (193). The adjectives that reinforce a sense of mutual connection remind one of Blake's eternity, where individuals will step into each other's bosoms in mutual interchange (E 246). The first possibility that Hunter relates, which involves an image of two parts of a vessel joining together, is capitalized by its mutual attraction, reciprocity, and unity, in that both parts stretch to meet the other on equal terms. As Desmond King-Hele has shown, Shelley was also familiar with Erasmus Darwin's work, since his tutor James Lind was connected to the Darwin circle (187-188). Darwin, in *The Temple of Nature* (1803), traces the development of life on the earth by emphasizing that "In branching cones the living web expands" before clarifying in his note that these cones are active arteries and veins (Canto I, Line 259, page 23). Therefore, the "elongating" action that Hunter describes aligns with the "branching" movement that Shelley's poet experiences with the maiden, harp, and natural surroundings through the creation of art. According to the *Oxford English Dictionary*, "inosculation" does not solely apply to blood vessels: "The action of inosculating; the opening of two vessels of an animal body, or of a vegetable, into each other; anastomosis; junction by insertion; hence, applied to the similar junction of fibres, and generally to any branch-system" ("inosculation, n."). Indeed, this word describes the fascinating phenomenon of two trees joining together as well, as the word "branching veins" takes on a biological and ecological register.

Hunter's description of the meeting of two parts of a blood vessel, which produces a healed and connected line, is reflected in the sensual scene that is foreshadowed by the branching veins. Initially, the poet watches the maiden as the impatience in her heart drives her to reach toward him, "her outspread arms now bare" (177), after her song. Prior to their more overt union,

he realizes that “His strong heart sunk and sickened with excess / Of love” which only abates when he “spread his arms to meet / Her panting bosom” (181-182, 183-184). Indeed, the extension and elongation of their arms allow their bodies to branch together and remedy any separation that the two may feel.

Most critics converge on the point that after the dream vision vanishes, the poet can no longer feel close to his natural surrounds as he feverishly wanders and searches for his elusive ideal. While I agree with this interpretation, I would like to push one step further to suggest that although he sees nature as cruel and gruesome, his body is nonetheless intertwined with the larger atmospheric patterns of natural circulation, such as that of wind, water, and vegetation. To gesture toward Harvey, *Anatomical Disquisition* makes clear that blood circulation mirrors other circulatory movements that give way to life: “for the moist earth, warmed by the sun, evaporates; the vapours drawn upwards are condensed, and descending in the form of rain, moisten the earth again; and by this arrangement are generations of living things produced; and in like manner too are tempests and meteors engendered by the circular motion” (46). As the poet wanders, his body registers every step he takes. He becomes immersed in the water cycle when he situates himself in a boat, “And felt the boat speed o’er the tranquil sea / Like a torn cloud before the hurricane” (Shelley 314-315), and later “like foam / Down the steep cataract of a wintry river” (345-346). Through these similes, the boat merges with the motions of the sea, rivers, and clouds together such that they become reiterated in the poet’s body. The boat and the poet both become part of the whirling waters, as “A whirlwind swept [the boat] on, / With fierce gusts and precipitating force” (320-321). The active and restless images of winding, circulating, and spinning—“wave ruining on wave, and blast on blast” (327)—appear time and time again across the poem. When the boat moves into “the windings of the cavern” (370), it encounters a “whirlpool[,]” “Circling

immeasurably fast," then the boat spins, "With dizzy swiftness, round, and round, and round, / Ridge after ridge the straining boat arose" (379, 381, 388-389). Through a combination of alliteration and repetition, Shelley's narrator shapes a wild and watery journey that shakes boat, poet, and reader. Amidst the continuous spinning and winding, the boat descends before rising again, which reflects the phases of rain and evaporation. The poet's body is swept away by these larger water cycles. Even after the poet leaves the boat, he continues to follow the rivulet that "winds" around the dell (494) and exclaims: "Thou imagest my life" (505). Although he sees the stream as a metaphor for his own mysterious mind, there is an underlying suggestion that the poet is deeply connected to the river, which is itself connected to a larger circulatory system.

Facing forests and dells, the poet becomes imbued in yet another form of circulation, or rather entanglement or bonding that hearkens back to his dream with the veiled maiden. Despite the dark atmosphere of the setting, there is a tenderness that pervades, as "The oak, / Expanding its immense and knotty arms, / Embraces the light beech" (431-433) not unlike the way in which the poet and maiden branched together. Slowly, with each careful caesura, the trees extend their arms and join in an embrace. Weaving is the metaphor that the narrator invokes to paint this scene: "the woven leaves / Make net-work of the dark blue light of day" (445-446). Not only do the leaves weave together in an artistic manner, but they reflect the light and form a net-like pattern that strings together different elements. This, too, echoes back to the power of the maiden's voice: "Like woven sounds of streams and breezes, held / His inmost sense suspended in its web / Of many-coloured woof and shifting hues" (155-157). Now, the poet is part of a different web or net. Indeed, winding rivers metamorphose into woven vegetation. At one point, the poet's heart wavers:

...The Poet longed

To deck with [the flowers'] bright hues his withered hair,

But on his heart its solitude returned,

And he forbore. (412-415)

The longing, a bodily and emotional feeling, that the poet expresses is to rest on the ground and entangle the lines of his hair with the vines of the flowers. He denies the social interactions for which he craves, such that his heart seemingly beats alone, in solitude. In just a few lines, the longing is replaced with forbearance, the action of resisting, tolerating, or even losing ("forbear, v."). In a paradoxical way, the more the poet tries to isolate himself mentally, in search of the elusive shape, the more he becomes immersed in the erratic circulation.

After all, nature was the one that provided and nursed the infant poet with its choicest impulses, which have transformed into more reckless impulses but, toward the end of the poem, the word "pulse" appears for the first and only time as a fluttering force that continues to respond. Specifically, nature directed these impulses to his heart, the same organ that he neglects and resists in the passage above: "Every sight / And sound from the vast earth and ambient air, / Sent to his heart its choicest impulses" (68-70). The tiniest of influences—each sight and sound—flow into the body of the poet and affect his pulsations for the remainder of the poem. At times, he feels certain forces and motions driving him, such as "A strong impulse [that] urged / His steps to the seashore" or "A restless impulse [that] urged him to embark / And meet lone Death on the drear ocean's waste" (274-275, 304-305). These impulses are more self-oriented and extreme, "strong" and "restless" rather than "choicest." He loses his interconnected consciousness and is fixated on the journey toward death. Only near the end does he yield to more social or ecological "pulses," as they final scene unfolds its cardiological references and situates the reader in the poet's blood again: "the Poet's blood, / That ever beat in mystic

sympathy / With nature's ebb and flow, grew feebler still" (651-653). As the poet's blood is brought to the fore, the narrator reveals that his blood was always beating and registering the movements—the ebb and flow—of nature. Even in his final moments, the musicality of his blood yearns to communicate with nature and grows feeble slowly. Indeed, his entire body has come into contact with nature a few lines before:

> [...] He did place
> His pale lean hand upon the rugged trunk
> Of the old pine. Upon an ivied stone
> Reclined his languid head, his limbs did rest,
> Diffused and motionless[.] (632-636)

Each part of his body—hand, head, and limbs—brushes against the materials of nature to close the distance that he once attempted to keep between himself and his surroundings. Although he appears motionless from an external perspective, his blood continues to flow until the end as the stars flicker above "—till the minutest ray / Was quenched, the pulse yet lingered in his heart. / It paused—it fluttered" (658-659). The impulses of nature have transformed into the pulses of his heart that beat and linger, hoping to extend his life and to continue its sympathetic music with the movements of nature. Indeed, the dash after "paused" gives the impression that the beating pulse has ceased to move, yet the narrator then draws attention to its "fluttering" motion which resembles that of a bird or butterfly. The balanced parallelism of this line mimics the subtle systole and diastole of the poet's fading heart and body. Although Boerhaave believed that "so long as the Heart continues its Motion, so long does Life remain, but whenever that Organ ceases to move, Life itself also ceases to be" (*Academical Lectures II* 92), his pupil Haller expanded on this and claimed that "in dead or dying animals, when irritated by heat, cold, vapours, poisons,

[...] watery liquors, wax, or blood, or on receiving an electric spark, [the heart] immediately contracts itself, by putting all its fibres into a rapid motion" (*First Lines* 45). Haller viewed this persistent motion as a mechanical one that "is *peculiar to the heart itself*" (45, emphasis in original), yet Shelley demonstrates that the flutter of the poet's heart reaches outward, in a social manner, to diffuse any solipsistic intentions he once had and allows the music of the body to play against the sounds and sights of nature.

**Shared Veins and Vines between Human and Plant**

Both the poet of "Alastor" and "Alastor" the poem do not stand alone, since critics have drawn connections between "Alastor" and the more botanical poem titled "The Sensitive Plant." Earl Wasserman is a crucial example since he directly overlaps the two poems in his monograph *Shelley: A Critical Reading*. From Wasserman's perspective, the narrator and poet of "Alastor" have different functions, as the former is able to engage in a reciprocal relationship with nature, whereas the latter is a visionary who pursues ideals that are beyond this world (16). In turn, while the narrator resembles the multitude of interconnected flowers in "The Sensitive Plant," the poet is instead equivalent to the singular sensitive plant (17, 18). This argument finds echoes in Harold Bloom's work, where he claims that the flowers "are sustained in their world because they stand in relation to one another" yet the sensitive plant receives but cannot give: "it becomes an *object* of love" (158, emphasis in original). Wasserman then shifts his focus onto "The Sensitive Plant" and claims that the sensitive plant is a symbol for humans; it is unique like man and "a native of the world-garden and yet is alien to it" (157). He goes further to state that the conclusion, which seemingly erases the decay of the garden in part three and deems it eternal, was already hinted at throughout the poem and the third part represents a shift in the sensitive

plant's powers of perception rather than the true death of the garden (165, 168). In another vein, Timothy Webb, with a nod to the sensitive plant and its human counterparts, asserts that "the plant seems to represent the position of man in the natural world, to which he belongs but from which he is also separated through the possession of mental faculties" (238). Taken together, these critical perspectives conclude that the sensitive plant—an anomaly—is both interwoven into its surroundings yet distanced from the other plants. Moving in another direction, I argue that the plant's association with the ethereal lady reveals that they are both part of a shared system of circulation. Much like the poet of "Alastor," the apparent singularity of the sensitive plant dissolves when one analyzes Shelley's use of cardiological terms that appear subtly throughout the four parts of the poem.

During the long eighteenth century, many experimenters and natural philosophers began to collapse the distance between animals and vegetation by linking the two spheres and species together. Despite the differences in the theories and methods of these experimenters, a thread that persists throughout their writings is the potential parallel between animals and plants, especially in terms of circulation. As an example, Boerhaave proposed in *Elements of Chemistry* that certain plant "vessels may not be improperly compared to [the] absorbent veins in Animals" (36). According to Darwin, "The parts which we may expect to find in the anatom[y] of vegetables correspondent to those in the animal economy" include "A system of absorbent vessels[,]" "A pulmonary system[,]" "Arterial systems[,]" and other glands, organs, and muscles (*Botanic Garden* 98). Both leaves and petals depict their circulatory properties, such that the circulations of fluids "seem to be carried on in the vessels of plants precisely as in animal bodies" (100). Indeed, in *Phytologia* (1800), Darwin detailed this overlap in a section titled "The Aortal Arteries and Veins of Vegetables" and he specified that "the branching veins, which bring

the blood from the leaves of the plants, ... unite at the foot-stalk of each leaf [then] venous trunks ... disperse the blood downwards along the barks to the roots, and to every other part of the vegetable system" (57, 58). Hunter continued these investigations in terms of his work on freezing organisms, as he claimed that both blood and sap will resist freezing when they remain in their respective bodies or have just been extracted in contrast to their quick solidification when removed from the body for long periods of time (*Treatise* 80).

A fascinating organism that breathes, feels, and responds to its surroundings, the titular sensitive plant of Shelley's poem has emerged time and time again in the essays of various literary critics. These scholars emphasize the vitality that emanates from Shelley's depictions of vegetation and plant life. For Robert M. Maniquis, the *mimosa*—the plant on which Shelley's sensitive plant is based—possesses "the elements of a nervous system" such that there is an analogical relation between plant and animal life (129, 146). Maniquis goes further to assert that the lady, much like the plant with its isolated yet reactive existence, seems to both transcend the garden but also remains within it (147). In terms of the interaction between the plant and the lady, Melissa Bailes proposes that in this poem, "vegetable species, and especially the *Mimosa pudica*, sensitively interact with their environment and respond to the death of their female caretaker, ultimately becoming emblems of ephemeral beauty themselves by succumbing to seasonal changes" ("Linnaeus's" 224). Indeed, Bailes draws on Darwin's *Phytologia*, in which he espoused the view that plants possessed both sensibility and volition, a point that rings true in the consciousness of this sensitive plant (234, 240). Ruston's reading of the poem is extensive and astute, as she brings to light the influence of researchers such as William Smellie, James Smith, Erasmus Darwin, and Adam Walker—all of whom believed that plants had vital properties akin to those found in animals—on Shelley's verse (133-134). Walker's statement on

plant blood is especially pertinent: “a wounded tree, on a frosty day, when the sun shines, will bleed freely on the south side” (*System I*, 199). In a letter, Shelley comments on a flower that he discovered in Italy: “There are also curious fleshly flowers, & one that has blood & that the peasants say is alive” (Jones 361; qtd. in Ruston 134). The sensibility, according to Ruston, “offers Shelley a discourse in which to frame his political belief in equality: the poem’s plants and humans partake of the same life, to different degrees” (134). Although Ruston notes the mutual atmosphere of living beings (137), William Keach moves in another direction by characterizing the poem through its cycles of evaporation and condensation, with images that are never quite still, such as the lady who appears and disappears (152). Expanding on the work of Maniquis, Bailes, Ruston, and Keach, I would like to instead focus on the circulation of fluids and feelings within this poem, rather than on sentiency in a more general sense. Specifically, I turn to the work of Stephen Hales—a researcher of the early eighteenth century who was referenced in Darwin’s *The Botanic Garden* (96, 100)—who applied many of the techniques in studying animals to his analysis of sap circulation, force, and direction.

Despite Hales’s mechanical view of both plants and animals, many of his discoveries illuminate the connective undercurrents of Shelley’s poem. According to Susannah Gibson, Hales supported the idea that plants were “Newtonian” or “hydraulic systems that followed mechanical laws” (154). Gibson claims that the central argument of Hales’s *Vegetable Staticks*, in which he used mathematical principles to analyze plants, was that “plants were hydraulic machines entirely explicable in terms of internal fluid (sap) flow” (156; see also Bailes 227). Nonetheless, the connections that he made between plants and animals, as well as his comments on the flexibility of plant circulation, are helpful here. His experimental methods were consistent across various species, as he fixed tubes to plants in different directions and also tubes into the

arteries of a mare, in order to determine the force of sap and blood circulation respectively (*Vegetable* 116; *Haemastaticks* 1). Indeed, he wrote in the preface to *Vegetable Staticks* that he had conducted experiments on animals "to find out the real force of the blood in the Arteries" and wished to do the same with plants (iii). In the midst of trying "to stop the bleeding of an old stem of a Vine," Hales suddenly realized "that if a long glass Tube were fixed in the same manner, as [he] had done before to the Arteries of several living Animals, [he should] thereby obtain the real ascending force of the Sap in that Stem" (*Vegetable* iii). Yet, the most fascinating part of his research was his finding that fluids in plants could move in multiple directions, unlike blood which, according to Harvey, could only flow in one direction due to the valves (64). Using an apple tree, Hales discovered that "branches will strongly imbibe from the small end immersed in water to the great end as well as from the great end immersed in water to the small end" (*Vegetable* 89). As Hales's biographer A. E. Clark-Kennedy asserts, Hales determined through his experiments that there is "reversibility of the flow of sap, and lateral communication between the vessels, [both of which] made the existence of a definite circulation of the sap unlikely" (69). As Timothy Webb has shown, Shelley was well aware of the topic of sap circulation, since his notebook is inscribed with passages from Humphry Davy's *Elements of Agricultural Chemistry* which detail the flow of sap through the tubes of plants (236, 237). Shelley notes that sap ascends, becomes dense, before falling down again through the bark (*Bodleian MS. Shelley V* 356-357; Notebook 172). Davy himself compares sap circulation to the movement of blood in animals (244-245). In addition, Darwin referred to "Dr. Hales" several times in the note section of *The Botanic Garden* (96, 100). I argue that Shelley's "The Sensitive Plant" employs Hales's concept of flexible circulation, which is akin to Deleuze and Guattari's rhizomic unfoldings and multiplicity; although Deleuze and Guattari begin their work by asserting that trees signify

descent, tracing, and reproduction, which opposes the anti-genealogical gesture of the rhizome, they soon assert that trees too can produce rhizomic outgrowths (10, 12, 15). As Hales's experiments demonstrate, when trees are inverted or cut, the sap indeed flows in new and radical ways. With the backdrop of Hales's research, Shelley illustrates that the sensitive plant's moods circulate and reach the emotions of the lady, such that the lady's death entails the loss of blood from the plant as well; in short, they are of a piece. Furthermore, the conclusion, which casts the mutable organisms into an ideal world, reverses the decay of part three because this form of circulation, derived from Hales, is unfixed, multidirectional, and open to creativity and surprise.

After briefly introducing the sensitive plant, Shelley's narrator proceeds to unfurl a catalogue of different flower species—such as snowdrop, violet, wind-flowers, tulip, hyacinth, rose, lily, jessamine—that intertwine and influence one another through the atmosphere, scents, and music suffused throughout the garden:

> For each one was interpenetrated
> With the light and the odour its neighbour shed,
> Like young lovers whom youth and love make dear
> Wrapped and filled by their mutual atmosphere. (I, 66-69)

There is a deep sympathy and connection between the flowers as each one absorbs different sights and sounds from their neighbours. Because Shelley describes the flowers as "shedding" their light and odour, there is a suggestion that particles from their bodies are lost and circulate into the stems and petals of other flowers that not only experience these stimuli but integrate them into their own bodies. Verbs such as "wrapped" and filled" paint a warm setting in which these flowers rest in comfort and tranquility amidst the "mutual atmosphere" that reminds one of the poet and maiden's shared veins. However, when turning to the sensitive plant, the speaker

notes: “But none ever trembled and panted with bliss / In the garden, the field, or the wilderness, / [...] As the companionless Sensitive Plant” (I, 9-10, 12). Unlike Blake’s Enitharmon, who trembles as a globe of blood and branches out to affect her surroundings (E 78), the trembling and panting motions of the sensitive plant remain lost to the senses of others, which renders the plant “companionless.” When the speaker continues to explain the plant’s unique condition, he again begins with the conjunction “but” to deem the plant an anomaly:

> But the Sensitive Plant, which could give small fruit
> Of the love which it felt from the leaf to the root,
> Received more than all, it loved more than ever,
> Where none wanted but it, could belong to the giver,
>
> For the Sensitive Plant has no bright flower;
> Radiance and odour are not its dower;
> It loves, even like Love, its deep heart is full[.] (I, 70-76)

Tracing the pattern of circulation within the plant, specifically “the love which it felt from the leaf to the root,” the speaker reveals that its moving emotions course through its body although they are less directly perceptible to others. He oscillates between the fullness of its love with the hyperbole that “it loved more than ever,” to the subtle expressions of that love, namely the “small fruit.” Indeed, a stream of negatives deprive the plant of bright flowers, radiance, and scent, yet “It loves, even like Love, its deep heart is full” (I, 76). Much like the excesses of the poet’s heart before he embraces the maiden, here the plant also wishes to communicate its feelings that are tucked into the depths—the deep heart—of its circulatory system. It is not that the plant is unable to participate in the larger atmospheric circulation, but rather that its

transmission of affection, tenderness, and empathy are projected without sights or sounds in particular and instead through the touches and caresses of the lady. The two come together to constitute a form of subtle and indirect circulation that crosses from plants to human, or human-like, figures and back again.

One crucial point that few critics have addressed is the fact that the sensitive plant is not referred to at all in the second part, at least not through direct references or descriptions, yet similar images and movements of emotions flow through the lady's body and emanate from her interactions—primarily her caresses—with the plants of the garden. "Like a sea-flower unfolded beneath the ocean" (II, 8), the lady is compared to a hidden flower. Akin to the sensitive plant, if this flower rests beneath the waters, then it would be difficult to see and smell, and therefore would only be perceptible indirectly through the bubbles or ripples that would arise from its movement. From "her tremulous breath and her flushing face" (II, 14) to "the heaving of her breast" (II, 22), the lady is twinned with the earlier characterization of the sensitive plant, as she too "had no companion of mortal race" (II, 13). Yet, it is her gentle touch that resonates deeply with the flowers of the garden: "I doubt not they felt the spirit that came / From her glowing fingers through all their frame" (II, 31-32). The spirit flows out from her fingers as the enjambed line spreads the energy to the flowers. Indeed, it appears to be a moment of radical circulation that moves from her body into theirs and courses through their frame. She continues to interact with them with her hands:

> She lifted their heads with her tender hands,
> And sustained them with rods and osier bands;
> If the flower had been her own infants she
> Could never have nursed them more tenderly. (II, 39-40)

Shattering notions of a family bound by traditional bloodlines, her tenderness and care, repeated twice as both adjective and adverb for emphasis, extends past the human realm to the world of flowers and vegetation. Lifting, sustaining, and nursing, the lady conveys her empathy with each touch. Another noteworthy point is the fact that all throughout part two, the flowers are no longer individualized or named, and instead come together as a group of flowers. Therefore, it is likely that the sensitive plant is no longer an outsider, but becomes one that interacts with the lady as well. Indeed, it is as if the sensitive plant's palpitations and emotions have moved outward into her body and thus become more directly expressed to the other plants, since it was unable to overtly express its feelings in the first part. Indeed, in Shelley's notebook, he details "The vibrating nerves" and "the beating blood" of the lady (*Bodleian MS. Shelley XVIII* 168-169; Notebook 139), which echoes the musical movement of the maiden's blood in "Alastor." In an unexpected manner, the plant circulates the movements of its heart to the lady, who in turn delivers these feelings to the living organisms in the garden.

With this intimacy between the sensitive plant and the lady in mind, it becomes clear why the sensitive plant reappears in the initial lines of part three as soon as it realizes that the lady has passed away. After the third day, the narrator reveals that a wave of different sensations are "felt" by the sensitive plant:

> And on the fourth, the Sensitive Plant
> Felt the sound of the funeral chant,
> And the steps of the bearers, heavy and slow,
> And the sobs of the mourners deep and low;
>
> The weary sound and the heavy breath,

And the silent motions of passing death,

And the smell, cold, oppressive, and dank,

Sent through the pores of the coffin plank[.] (III, 5-12).

Sounds, steps, sobs, smells join together alliteratively to affect the body of the sensitive plant who is able to perceive the lady's passing despite the plank that covers her form. In his notebook, Shelley had originally used the word "heard" yet replaced it with "felt" when describing the way in which the plant registers the funeral chant, the steps, and the sobs, each adding a layer to the tactile experience (*Bodleian MS. Shelley XVIII* 260-261; Notebook 220-221). The narrator makes the interconnective circulation clear, as he laments that "The garden, once fair, became cold and foul, / Like the corpse of her who had been its soul" (III, 18-19). The sensitive plant reacts with its own tears:

The Sensitive Plant like one forbid

Wept, and the tears within each lid

Of its folded leaves which together grew

Were changed to a blight of frozen glue[.] (III, 82-85)

Although it weeps, the tears themselves are contained within its leaves, and the only growth that unfolds ironically rhymes with "glue" and fixes the different parts of the plant together, rather than allowing for movement of emotions and tears, the latter of which could represent sap. Indeed, the narrator continues to describe the decay of this plant: "The sap shrank to the root through every pore / As blood to a heart that will beat no more" (III, 88-89). Unlike the smells that moved out from the pores of the coffin, here the circulating sap shrinks to the roots and withdraws itself. The stark cardiological imagery that aligns sap with a bloodless, dead heart reverses the plant's full heart from the first part of the poem. As weeds and other speckled plants

populate the garden, the initial garden—with its circulation between the sensitive plant, lady, and flowers—revolves and transforms into a more gothic landscape dense with "forms of living death" (III, 98).

Yet, all of these circulatory and transformative movements reverse with the conclusion, where the narrator supposes that the garden with the lady and atmosphere "In truth have never passed away: / 'Tis we, 'tis ours, are changed; not they" (Conclusion, 19-20). The stanza begins and ends with gestures toward the garden in a way that resists the story of fall or decay that has unfolded from part one to part three. However, the ambiguous punctuation of colons, commas, and semi-colons creates a connective thread that links "we" with "they." Just as the plant appears separated from the garden yet is involved in its circulation through the lady, the earthly world seems to be distanced from more heavenly or ideal forms but is, in actuality, subtly connected to the spiritual through these poetic lines. The final reversal, which presents the possibility that the lady, plant, and garden persist beyond human levels of temporality and mortality, is made possible because circulation itself, especially plant circulation according to Hales, is unpredictable, reversible, and adaptive. Wasserman states that the poem provides subtle signs of eternity from parts one to three (165). In a similar vein, I suggest that the conclusion performs another form of reversal, since it urges the reader to reread the poem and to look for this alternative possibility that the garden persists past the decayed heaps of the third part.

**The Hand that Writes and Seeks the Social**

While Shelley's two poems illuminate the ways in which blood exceeds the contours of the body onto other individuals, nonhumans, and environmental landscapes, Keats's short poem points to an instance of blood transfusion, where blood moves from the reader to the speaker.

Keats's engagement with the medicine and science of his milieu have been elucidated by scholars such as Hermione de Almeida, David C. Goellnicht, and Hrileena Ghosh, all of whom have addressed the link between Keats's poetic lines and cardiological concepts or processes. For King-Hele, Keats shares with Darwin the experience of "operations without anaesthetics, the perpetual blood-lettings and the general uncontrolled ravages of disease" (228). Providing the timeline of Keats's medical studies, de Almeida traces his development as a young surgeon: the apprenticeship to surgeon-apothecary Thomas Hammond, two semesters of lectures at Borough Medical School, his clinical attendance at two hospitals, and his appointment as surgeon's dresser to William Lucas, Jr. (24). In the libraries, one could find books written by Davy, Priestley, Erasmus Darwin, alongside the works of Hunter, Haller, and Cullen (30). From de Almeida's perspective, "Keats reveals an absolute preoccupation with defining the role of the poet through the concerns and characteristics of the true physician" as poetry becomes a tonic for worldly pains (37, 38). The short poem in particular is "about the palpable hand of comfort and power of a living albeit dying physician and poet" (37). Indeed, Keats brought his knowledge of cardiology to his writing of poetry. During his time at Guy's Hospital, his teachers—Henry Cline and Astley Cooper—gave lectures that spanned topics such as circulation, physiology, the heart, the veins (26). These lectures drew specifically on John Hunter's research, since the two professors had been Hunter's pupils (de Almeida 87; Goellnicht 25). Blood expressed the qualities of life and vitality in Hunter's eyes, a point which he repeated in various research documents (*Treatise* 77; "Proposals for the Recovery" 414). Ghosh emphasizes the fact that these lectures made their way into Keats's medical notebook in 1816, "while [Keats] was a surgeon's pupil and dresser at Guy's Hospital" (173). Ghosh deems this notebook "a working document—a dynamic repository of information that could be augmented and updated as

needed" (175). Indeed, Keats, with references to Hunter, addresses topics such as blood composition, coagulation, arteries, and veins in his notebook (*Anatomical Note Book* 4, 5, 7, 12). According to de Almeida, the sixty-two images of blood in Keats's poetry all align with Hunter's concept of blood vitality (90). "This Living Hand" is a portrait of "an unnatural transfusion of blood between living and dead" as, paradoxically, "the stimulus of death has been so strong that it attracts life too intensely and must therefore be transfused with living blood to nourish its very deathliness" (91, 92). Therefore, the warm blood ends up chilling the blood of the addressee (92). Indeed, Keats's familiarity with blood is not limited to his medical studies or surgical practice. As Goellnicht details, Keats faced the death of his brother Tom as well as his own failing health between the years 1818 and 1821, with an episode of blood-spitting in 1820 (207). He was aware of the procedures of blood-letting that were common for his time, since he experienced it for himself after his lung hemorrhage (209). "This Living Hand" presents a dark tone and "there is an almost unnatural detachment in these passages as Keats compares the warmth of the living hand, in which the blood flows like a stream, with the coldness of the dead hand, which he would often have observed during his days as a medical student" (146). Goellnicht expands by stating that "the stress on the blood from the lover's heart draining 'red life' into the veins of the rejected poet to warm his hand reveals a strong physiological interest" yet Keats also feared that his hand would not obey his head during surgical interventions (147). In particular, Ghosh explains that "The last operation Keats performed was an arteriotomy" and he communicated his fear of harming the patient to his friend Brown (179). In terms of "This Living Hand," Ghosh asserts that it "imagines blood wishfully ebbed out of the reader to flow into the poet, reanimating him" (193). In short, "the poet imagined for himself a vampiric transfusion, draining the reader of life" (196).

Yet, I would like to extend these literary explorations and argue that the specific history of blood transfusions, between animals and from animals to humans, is pertinent to the understanding of Keats's poem. Blood transfusions were not solely used to heal instances of blood loss or physical disease, as experimenters believed that blood could transport characteristics and traits of the donor to the recipient as well. According to Anita Guerrini, transfusion experiments using animals became more common in the 1660s since the technique was believed to have "therapeutic potential" or "the notion of reinvigorating old or diseased blood with an infusion of new, healthy blood" ("Ethics" 402-403). Specifically, Guerrini states that the "blood of young calves and lambs was [seen as] purer than human blood, less tainted by human passions and vices" (*Experimenting* 41). Despite Hunter's claim that transfusions were often successful and showed the consistencies in blood between different animals (*Treatise* 13), Guerrini reveals that, in actuality, the mortality rate was high among the animals used for experimentation ("Ethics" 403). However, this did not prevent experimenters from extending the practice to humans, which began in 1667 with Jean Denis in Paris, who asserted "that temperate-living animals produced purer, more wholesome blood than humans" and therefore used lamb's blood for his patient (Guerrini 403-404). The well-known counterpart to Denis' work is that of Richard Lower in London. Guerrini explains that the patient, Arthur Coga, was viewed as "freakish and extravagant" by Henry Oldenburg yet his behaviour improved, evidenced through Coga's good pulse and appetite, after Lower had transfused sheep blood into Coga's body (Oldenburg 611; Boyle 365-367; King 559; qtd. in Guerrini 404). In Simon Schaffer's essay, he notes that Coga himself claimed that the blood was symbolic, much like the blood of Christ, although he felt more feverish the second time when his body took in more of the sheep's blood

(101-102). Indeed, as Guerrini mentions, it is likely that these patients were experiencing a hemolytic reaction to the foreign blood (*Experimenting* 42).

Using this historical context as a frame for my analysis of Keats's poem, I propose that beyond the gothic or threatening tone of the poem's speaker, the speaker views the reader as a potentially healing presence who can mend the struggles of his mind and body by sharing blood in a social way. A striking entry within Keats's medical notebook is one that captures the importance of anastomosis, a term that I previously addressed in relation to Shelley's branching veins that repair and strengthen the connection between maiden, poet, and art. For Keats, "The Anastomosing of arteries is very important and its great advantage is that upon the obliteration of a Vessel the Anastomosing vessels carry on the Circulation" (*Anatomical Note Book* 7). In short, severed lines of connection and circulation must be healed through the poetic invocation of cardiological images. Contact and connection are both central to this poem, which begins and ends with the image of a specific, physical hand:

> This living hand, now warm and capable
> Of earnest grasping, were, if it were cold
> And in the icy silence of the tomb,
> So haunt they days and chill they dreaming nights
> That thou would wish thine own heart dry of blood,
> So in my veins red life might stream again,
> And thou be conscience-calm'd.
> See, here it is—
> I hold it toward you. (1-9)

Apart from the warmth of this hand that runs with blood, the speaker draws attention to the fact that it is "capable / Of earnest grasping" in a way that echoes both the moving and trembling blood lines in Blake's poetry as well as the touches shared between Shelley's sensitive plant and lady. The phrase "earnest grasping" suggests a care for the other and the continuous action of grasping or reaching out. Lower, in *A Treatise on the Heart*, created a striking analogy for the body's circulation system, as he viewed the vessels as hands that supported the heart: "There are indeed many helping hands ... stretched out to assist the heart, but the chief support and stay of its parenchyma are the blood-vessels, which are like so many roots for its attachment" (10-11). In a similar way, Keats's speaker not only imagines shared blood, but also shared touches by holding each other's hands and feeling the pulsations of life. Therefore, he moves from describing his hand to placing it in front of the reader: "See, here it is— / I hold it toward you" (8-9). This is the only instance in the poem where the speaker, the "I," directly gestures toward the reader, the "you." The speaker reaches out to the reader and hopes for a response, a mutual interchange in the words of Blake (E 246).

There is a reciprocity in this blood connection, not only through the reader or listener's flow of blood that moves from their own body to that of the speaker, but also through the processes of reading that are subtly brought to bear in the poem's lines. To begin with, the blood that comes from the reader is seen as healing and pure, yet the word "might" evinces the speaker's doubt in the process of blood transfusion, which reveals Keats's awareness that this blood may be rejected from the body. Indeed, after conducting his various experiments, Lower concluded that these transfusions may not work for those suffering from long-term illnesses (190).[4] Therefore, the speaker incorporates a second meaning—namely a literary connotation—for the word "hand" into his poem, specifically a hand that designates penmanship, writing, or

the creation of poetry. In short, there is a possibility that the hand represents the poem itself, especially since when the speaker imagines his dead, cold hand, he emphasizes the "icy silence" of the tomb. The movement from the reader's "heart" to the speaker's "veins" may instead signal the reader's devotion to rereading and reading aloud these lines—the veins of the poem—such that reading itself becomes a form of intimate, emotional blood exchange that crosses biological limits and moves in cross-temporal directions. The poem therefore becomes a locus that needs the blood of both speaker and reader to intertwine and form its meaning. There persists a desire for the reader to continue reading the poem and bringing it into different presents, different periods, such that its metaphorical blood, alongside the reader's own blood, will continue to flow, pulse, and beat.

**Conclusion**

Between humans and nonhumans, and between Romantic poets and readers, blood signals the possibility of new relationships and lines that ring with empathy and emotion. While Shelley demonstrates the fact that seemingly singular figures are, in actuality, intertwined in different patterns of circulation that involve nonhumans, plants, and the larger atmosphere, Keats extends his poetic lines across time to influence the blood circulation of different readers. Transformative and metonymic, blood gestures to social relationships beyond the individual body, the human species, and the present time. For both Shelley and Keats, the reader's position is crucial, which is an issue that emerges in Mary Shelley's *The Last Man* as well. Keats addresses the issue of bloodlines in the context of disease and transfusion, whereas Mary Shelley brings to light the effects of global plague that collapse the structures of society, such that Shelley's protagonist and narrator Lionel Verney searches for new groups to connect with,

including other animals and the presumed reader. Above all, it is Verney's heart that urges him to communicate and seek out other forms of consciousness.

Notes

1. For a comprehensive review of Shelley's engagement with the scientific disciplines of his milieu, see Marilyn Gaull's "Shelley's Sciences."

2. Multiple critics have drawn attention to Keats's self-diagnosis based on his own blood; for example, see Ghosh (198), Gigante (*Keats Brothers* 324), and Goellnicht (207, 246).

3. A related term is anastomosis, which is defined as the repair of vessels through surgical intervention. In 1761, Richard Lambert wrote a letter to William Hunter detailing his attempt to repair an artery and he reported his success, for the pulse of the patient was little altered after the operation (*Medical Observations II*, 360-364).

4. For more on the ambiguities of blood transfusion, see Holly Tucker's *Blood Work*, in which she traces the fact that Jean Denis' patients often fell ill after the transfusion (164). Furthermore, Guerrini reveals that Denis' mad patient passed away in January 1668 after his transfusion ("Ethics" 404).

## Chapter Three

The Social Heart, Plagued by Solitude: Reaching toward Animals and Readers in Mary Shelley's *The Last Man*

### Introduction

In the poetry of Blake, Shelley, and Keats, it becomes clear that blood, although situated in the body, expresses sociality, connectivity, and relationality such that its lines extend outward onto both human and nonhuman others. In the final section of the previous chapter, Keats's "This Living Hand" bridged together the process of blood transfusions with the fraught—yet much desired—relationship between authors and readers. Now, I shift to a prosaic example. The link between blood, readers, and nonhuman forms of circulation comes to the fore in Mary Shelley's *The Last Man*, in which a mysterious plague terrorizes the world in the twenty-first century and the number of humans slowly dwindles down to a singular last man named Lionel Verney. Verney, in turn, writes his tale in hopes of reaching future readers. As the narrative unfolds, Shelley slowly undermines the traditional bloodlines that exist within families and that represent social status or royal lineage. Instead, she reshapes them into social ties that cross boundaries between non-biological relations and also considers the kinship between humans and animals. When the structures of human society collapse, blood—which pulses through the body and indicates the possibility of different relationships—must be imbued with new meanings as humans begin to disappear from the diseased world. Because Verney's body and blood yearn for connection to others, he extends his lines of prose to the reader and makes attempts to befriend animals, animals that he initially viewed with contempt or ignorance. His blood seeks the mutual interchange, the synchronous ebb and flow with nature, and the connective transfusions that were

central to the characters in Blake's, Shelley's, and Keats's poems. Mary Shelley illustrates that a plague-stricken society radically dissolves existing bloodlines such that new ties may form and flourish, as Verney's blood drives him to speak, to write, and to communicate in newfound ways.

**The Place of the Animal**

Because Shelley's novel was published in 1826, she likely would have been aware of the debates surrounding animal rights, animal experimentation and vivisection, blood sports, and vegetarianism that dominated the social and political atmosphere during this time. As several historians have noted, the long history of mistreatment of animals was slowly shifting during Shelley's milieu. Tracing this history in the field of scientific experimentation and research, Domenico Bertoloni Meli asserts that during the early modern period, the vivisection of animals was a normalized and common practice used to determine the movements of the living body, with the key example being William Harvey's work on a diverse range of animals for his publication *De Motu Cordis* (200-201, 204). Meli builds on this point by stating that "in order to draw conclusions on human subjects it was necessary to generalize from animals" (221), as experimenters such as Hales, who was mentioned in the previous chapter, established connections between different species.

Moving forward, A. W. H. Bates draws on nineteenth-century documents and medical journals in order to illuminate the shifting attitudes toward animals alongside certain complaints regarding comparative analyses. Bates reveals that one concern was "that animals differ so greatly from humans physiologically that results could not reliably be extrapolated between them [and if] animals were sufficiently similar to humans for results to be transferable, they ought also to be conscious of pain" (33). However, Bates clarifies that many experimenters still viewed

animal experiments as a necessary part of their field and certain scientists projected an image of themselves as kind and humane toward animals for the purpose of reassuring their patients, rather than for the health and safety of the animals themselves (31). Despite the fact that animal issues were often linked to human reputation, image, and social status, a series of proposed bills and acts during the nineteenth century revealed that humans expressed a growing concern for the well-being of their animal counterparts. Anita Guerrini is helpful here for contextualization, as she has written extensively on the topic of animal rights during this period. For instance, the Anatomy Act, which was passed in 1832, stimulated debates about human anatomy in relation to animal vivisection; these debates were already circulating in society since the French experimenter François Magendie visited England and vivisected animals before an audience in 1824 ("Animal" 72, 73). In 1825, Richard Martin, who formed a bill that banned bear-baiting, used Magendie as an example of cruelty toward animals in order to support his own political views (78). Martin intended to expand on his 1822 act, which prioritized the well-being of working and domestic animals, to include "those involved in public displays such as bear-baiting, rat-catching and animal fights" (79), otherwise known as blood sports. Yet, Guerrini astutely asserts that the example of Magendie was illogical for Martin's argument because the revisionary bill did not cover animal rights in the context of science and experimentation (80). Therefore, her analysis illustrates the ways in which these different branches of animal issues were all intertwined. The question of the animal remained a persistent concern throughout the nineteenth century. Martin's initial law found additional support when the Royal SPCA was formed in 1824 (79), yet Guerrini notes that it was only in 1876 that the Cruelty to Animals Act was passed and thus restricted vivisection and even then, the final decision rested in the hands of scientists (*Experimenting* 90).

Given the atmosphere of these fraught discussions concerning animal rights and positionality, many Romantic authors responded by foregrounding animals and medical practices in their texts. Guerrini gestures toward Tim Marshall's analysis of Mary Shelley's *Frankenstein* in light of the Anatomy Act, before she provides more historical details in her article ("Animal" 71). Marshall shows how *Frankenstein* intersects with "the nationwide phobia of 'bodysnatching' possibilities" and "the anatomy reform of the 1820s [aimed] to dissociate the [surgical] profession from undesirable associations and to secure an invisible supply-line of corpses" (11-12). Marshall illustrates that, in *Frankenstein*, there is a crossover between creation and destruction as well as an overlap between "the surgeon, the dissector, and the murderer—and then the writer and the artist" (13). At times, he draws attention to the animal dissections, such as the public demonstration performed by Astley Cooper—who was Keats's professor at Guy's Hospital—in 1801 (71). Branching off in a related direction, John Perkins comprehensively addresses the ways in which Romantic writers viewed practices involving animals such as cruel behaviours or violence, hunting, badger baiting, pet-keeping, work animals, and animals as food. Perkins brings to light the fact that the Shelley circle was imbued in these debates, since Mary Wollstonecraft and Percy Bysshe Shelley were both against cruelty toward animals (43). For instance, Shelley's devotion to vegetarianism is well-known as he, alongside others like John F. Newton and William Smellie, believed that consuming meat would not only lead to outward displays of violence, but would also deteriorate the consumer's body through various diseases (117). Furthermore, Shelley rejected game laws which supported the continuation of "bloody" hunting practices since he believed that these individuals should nurture animals instead (71). While Percy Bysshe Shelley creates a bloody image of violence and fear when discussing

animals, Mary Shelley, I argue, explores more redemptive lines of blood that link together humans and animals in *The Last Man*.

**Previous Criticism on the Last Man**

Most of the existing criticism on Shelley's *The Last Man* takes on topics that diverge from the blood imagery in the narrative. A constellation of illuminating essays can be found in *The Other Mary Shelley*. To begin with, Morton D. Paley considers the novel a special case where apocalypse unfolds without the millennium or regeneration that often follows it in Romantic literature, as "signs of a millennium appear only to be dissipated" in Shelley's text (110). Both imagination and art seem to be futile against the sense of hopelessness that the plague engenders (113, 114). From the perspective of Barbara Johnson, the plague is what "replaces the victory of the West over the East" at Constantinople and, beyond that, constitutes the inverted image of Western humanism with its universal discourse (264). For Audrey Fisch, *The Last Man* presents the negative consequences of different political systems; however, the text concludes on a hopeful note since the story is a prophecy from the Sibyl detailing the events of the twenty-first century while the translator is an anonymous figure who is supposedly of the same milieu as Shelley herself. All of the political systems which are explored in the novel exhibit a fundamental flaw because of "their emphasis on the idealization of the male leader and their glorification of imperial England, separate and safe" (273). She astutely asserts that this reality can be averted because by the end of the novel, the narrator or translator remains: "No one, then, is dead yet" (279). The frame narrator represents a possible answer, for he has "eschewed a politics of perfection and totality" (280). In addition, Fisch draws a connection between Shelley's novel and the AIDS crisis: "That England should be a safe ship while Asia

Minor's ship sinks has an analogue in the myth of the safety of the 'general population' from AIDS" (270).

On this biological and scientific note, other scholars have addressed the issues of circulation, animals, and ecology in Shelley's novel, yet the figure of blood has not been central to their analyses. Alan Bewell, in *Romanticism and Colonial Disease*, contextualizes the novel by noting the outbreak of cholera in 1817 and the spread of disease in 1824, the year in which Shelley began writing this novel (296). Bewell asserts that England does not possess divine immunity from the disease in Shelley's novel, because the movements of disease across the world were intertwined with colonial projects, empire, and other forms of global circulation (297, 298). Bewell references David Arnold and Donald Denoon's assertion that colonialism ultimately becomes a "health hazard" (302). In the case of Verney, his transition from a savage to an educated and civilized individual is inscribed in "colonial language" (302). On a wider scale, England is also susceptible to social collapse, and people from other nations flood into England, or what Bewell terms "colonial return on a massive scale" (306). One key point of Bewell's argument is that Verney's encounter with the black man infects him with plague yet he survives nonetheless: "Perhaps Shelley wanted this embrace, which functions as inoculation rather than contagion, to serve as an allegory of the fearful embrace of colonial encounters" (313). Shifting to more geological patterns, Melissa Bailes, in *Questioning Nature*, brings Shelley's novel together with issues of extinction in the long eighteenth century. She contends that Shelley's portrayal of human extinction aligns with the research of Georges Cuvier, who asserted that "the magnitude of catastrophes produced by the earth gradually weakens over the course of time" (151). In a similar vein, "Shelley represents this planetary enervation through anticlimactic natural disasters and by radically shifting geological catastrophism into the

psychological 'world' of the individual" (151). Indeed, Shelley's focus on plague illustrates that extinction unfolds without intense, "geological disaster" (165). To build on this point, Bailes asserts that plague brings geological catastrophe into an individual's life by destroying domestic structures (165). Even though the plague takes seven years to affect the entire world, it "swiftly" reduces the individual and the family into nothingness (167). Bailes claims that Shelley focuses on "devastation rather than renovation" and, therefore, the novel ends with Verney "[inscribing] his own gravestone before embarking on a search for life that can only end in death" (170, 176).

Concerning the topic of animals, Timothy Morton focuses on Percy Bysshe Shelley, especially on the utopian tone of the writer's vegetarian perspective, yet Morton emphasizes that *The Last Man* features "millenarian and aristocratic vegetarians" as well (132, 29). The plague instigates transnational flows that disrupt the purified space of Windsor such that "the only thing that can happen to the millennial paradise is its disfiguration, and an epidemic serves to stress the randomness of this process" (52). Although the characters attempt to bring forward utopia by only consuming vegetables, they ultimately face the downfall of human culture (53, 56). Morton asserts that "[t]he novel articulates the contradictions inherent in the progressive humanism of thought amongst the radical middle and upper classes in the period of the Industrial and French Revolutions: "confident about the universality of its claims, but anxious about the decoded flows of pollution that capitalism has released" (56). On a similar note, Hilary Strang bridges political and ecological concerns in her article, as she puts forward the argument that the novel questions whether "there [can] be a democratic equality among persons that does not risk the reduction of personhood to the simple equivalence of one biological, animal life with another" (409). In the context of the plague, life is the only thing that matters, yet "if democratic man is a creature with rights inherent in him solely by the fact of his being alive, [...] does he not risk being mistaken

for [the Malthusian] man of the 1790s whose endowment with life is sufficient to make him the matter of government…" (413)? Strang continues by asserting that human life may be too weak a force to sustain the structures of government since life loses its ordering principles (415, 419). Indeed, "Once the human world has been transformed into a place where only life counts, other lives are free to wander in" (423), including those of animals. I will go one step further to illustrate that these animals "wander in" to disrupt Verney's pre-conceptualizations about the ties between humans and animals in terms of cardiological circulation.

Critics such as Anne K. Mellor have drawn attention to the biographical angle of Mary Shelley's novel and Mellor notes that Adrian represents Percy Bysshe Shelley, Lord Raymond aligns with Lord Byron, and Shelley herself is imaged or self-projected onto the characters of Lionel and Perdita (149, 151, 152, 157). In turn, this circle of characters comes together to illuminate the consequences of male egoism (151). Furthermore, Mellor asserts that Shelley's journal entries reveal that she herself felt akin to the last man: "The last man! Yes I may well describe that solitary being's feelings, feeling myself as the last relic of my beloved race, my companions, extinct before me—" (Feldman and Scott-Kilvert 476-477; qtd. in Mellor 157).

Taking these investigations a step further, I revisit Shelley's journal and argue that there are instances where she specifically refers to her heart and blood when discussing the depth of her loneliness. When lamenting the deaths of William, Clara, Allegra, and her husband Percy, Shelley reminisces about their hands: "warm with blood & life when clasped in mine. Where are they all" (Feldman and Scott-Kilvert 435)? Their lives, indexed through the warm blood coursing through their veins much like Keats's living hand, are memorialized in the physical and literary lines of Shelley's own hand. She revisits this heartfelt loneliness several times by reiterating the fact that "[her] heart fails when [she thinks] by how few ties [she holds] to the world" (Feldman

and Scott-Kilvert 478). As a social figure, her heart wavers from the shock of solitude. On the other hand, her heart heals when she realizes that she remains connected to others: "I am loved by some [and] that thought is peace to my heart" (Feldman and Scott-Kilvert 551). Although the word "solitude" echoes throughout Shelley's novel, such that an untethered feeling permeates and becomes palpable to the reader, there is nonetheless an undercurrent of hope for social bonds that is conveyed through Shelley's use of cardiological images or references. Indeed, Verney's father is deemed the "lost man," which is an alliterative counterpart that foreshadows Verney's title the last man, immersed in "solitude" (12). Perdita loves to wander by herself (15), and so too does Adrian (91). Much like the seemingly solitary figures of the poet of "Alastor" or the sensitive plant, Shelley shows the ways in which instances of solitude contain the germ of relationality. Her characterization of blood differs greatly from that of other plague narratives, such as Daniel Defoe's *A Journal of the Plague Year*. In Defoe's case, blood is viewed in medical terms as the basis of both health and disease, since the effluvia enters the body then "[puts] Blood into an immediate ferment" (73). Indeed, the narrator repeatedly emphasizes that the disease appears to be located in the blood, as he describes "the Poison in [the patients'] Blood" or "the penetrating Poison insinuating it self into their Blood" (Defoe 166, 192). On the other hand, Shelley is less focused on the specifics of disease and more so on the social relations that arise from reconceptualizing blood ties beyond the individual, family, and human species. In short, blood becomes a marker of emotion, friendship, love, and bonding, as Shelley unweaves its more limited connotations of singularity.

**Tracing Histories through Traditional Bloodlines**

Toward the beginning of the narrative, Shelley illustrates the fact that blood can be a constrictive and limiting force when viewed in a traditional manner as being tied to the self, the family, or to royal lineage. Apart from dedicating the initial pages of his narrative to his father, Verney sees both himself and his sister Perdita as reflections of their late father's personality. While Verney inherited "The appetite for admiration and small capacity for self-controul" (14), Perdita's connection points directly to her blood: "All the genius that ennobled the blood of her father illustrated hers; a generous tide flowed in her veins" (16). Their biological connection to one another, signaled through terms such as "appetite," "blood," and "veins," illustrates the transfer of different traits and tendencies across generations. However, Verney's traditional view of bloodlines becomes destructive when he believes that the harm that Adrian's father caused his own father, itself a misunderstanding, will also characterize the relationship between Adrian and himself: "We, descendants from one and the other, must be enemies also" (23). He becomes fixated on the fact that their bloodlines have locked them into a disagreeable relation with each other, prior to even meeting Adrian himself. He casts this judgment in cardiological terms: "Doubtless, he also, whose blood received a mingling tide from his proud mother—he, the acknowledged focus of the kingdom's wealth and nobility, had been taught to repeat my father's name with disdain" (22). Verney remains certain and "doubtless" that because Adrian's blood derives from both the king and the Countess of Windsor, he too will share her negative views toward his late father. Just as lamb's blood was deemed pure to reflect the animal's behaviours by experimenters such as Jean Denis (Guerrini, "Ethics" 403-404), here blood is the basis of a person's characteristics with little room for improvement or change. From Verney's perspective, the difference in their respective bloodlines creates a wide chasm between them that cannot be bridged, such that blood isolates them into their separate social spheres. This view is reiterated

later on, when the Countess of Windsor reminds her daughter Idris that royal blood runs in her veins and therefore she cannot marry a lower-class individual such as Verney: “Lady Idris, it is not alone the once royal blood of England that colours your veins, you are a Princess of Austria, and every life-drop is akin to emperors and kings” (82-83). Through this hyperbole, where each drop of blood signifies a thread that connects her to royal figures, Idris is chained to her position—suspended like a puppet—in a way that ironically restricts the life flowing in her frame. However, Adrian undermines these connotations and interprets the connection between himself and Verney in another direction: “We were born to be friends to each other; and though ill fortune has divided us, will you not acknowledge the hereditary bond of friendship, which I trust will hereafter unite us” (26)? For Adrian, blood not only represents familial ties, but also conveys the friendships of the past—specifically the friendship between his father and Verney’s—and brings these relations into the present and beyond. Adrian’s key phrase, “the hereditary bond of friendship,” is a paradoxical one which reveals that friends can share bonds that are as strong as those between family members. From the past to the future, Adrian insists that their existence as two individuals should be unified into a plural “we” or “us.” Shelley then shifts to focus on the way in which Verney’s blood fundamentally changes in response to Adrian’s request.

**The New Familial Circle**

Following Adrian’s paradoxical statement, Shelley begins to reshape these more limiting views of blood in order to put forward new bloodlines that will eventually extend from Verney to the reader and to animals. At first, Verney does see himself as akin to animals, though in a negative light: “My life was like that of an animal, and my mind was in danger of degenerating

into that which informs brute nature" (18). Since animals are lowly and uncouth, Verney wishes to distance himself from this association. After listening to Adrian's kind words, Verney feels a change in his body: "my heart, my savage revengeful heart, felt the influence of sweet benignity sink upon it; while his thrilling voice, like sweetest melody, awoke a mute echo within me, stirring to its depths the life-blood in my frame" (26). As if he is lifted from a state of suspension and stasis, Verney's life-blood begins to beat and echo in response to Adrian's words and stirs into life and vitality. Adrian's voice, coupled with the clasp of his hand, "touched [Verney's] rocky heart with his magic power, and the stream of affection gushed forth, imperishable and pure" (28). The fixed views and traditions, metaphorized as the "rocky heart," give way to the image of flowing water that evinces a healing and redemptive power which is central to this social concept of blood ties and relationships. Indeed, their bond becomes a reciprocal exchange, as Adrian too "opened to [Verney's] view the living page of his own heart, and gave [him] to feel and understand its wondrous character" (32). The metaphor of the heart as a book, specifically one that is read and shared, reveals that this deep-seated organ produces ripples of connection that move out from the body onto the affections of others. Later on in the narrative, Idris becomes concerned when her brother Adrian falls into madness and she, in turn, seeks the help of Verney: "Verney, you will acknowledge this tie, and as my brother's friend, I feel that I may trust you" (52). This tie, otherwise known as "the hereditary bond of friendship," will continue to grow and strengthen throughout the novel, such that Verney soon emphasizes that "[they] sat like one family round [his] hearth" (79). The warmth of the hearth intersects with their shared bond to produce a circle, and circulation, of their connected feelings. A crucial detail is that all of these events take place prior to the marriage between Verney and Idris which would eventually link their families together in a more formal manner. When the plague begins to

torment England, Adrian wishes to lead the country as its Protector yet Verney worries for his friend's fragile health and offers to take his place instead (255). Adrian rejects this gesture and hopes Verney will protect his sister Idris, to whom he is now married: "my brother; for such you are by every tie" (256). The plurality of ties suggests that this blood tie was already established even before the marriage between Verney and Idris. Shelley illustrates that across various interactions, the characters sacrifice their own energy, health, and blood such that their friends and family are well-protected in a way that evinces a shared form of circulation and connection.

**Transfusions of Energy**

Akin to the speaker-reader transfusion that flows throughout Keats's short poem, Shelley constantly describes episodes of healing where the energies of characters circulate between each other, such that the devotion of a friend or family member remedies the illness and fevers of another individual, as if their bodies were part of a shared physiological system. Although there are no episodes of direct blood transfusion, certain scenes between Verney and Adrian, and between Verney and Idris, reveal the depth of their bond with one another. When Adrian becomes mad due to the loss of his love Evadne, Verney visits and cares for him: "Such for three days and nights appeared the consummation which fate had decreed for my labours, and I became haggard and spectre-like, through anxiety and watching" (72). As Adrian's faculties and reasoning returned, "he pressed [Verney's] hand, now more fevered than his own" (72). Here, the health of Verney flows through the pores of Adrian's body and heals him, such that Verney is now consumed with illness in return. Upon observing Adrian, Verney exclaims: "the faint rose again blushed on his cheek; [...] such as the dear reward of my unremitting attention" (74). Each line shifts the energy from Verney to Adrian; the former's body ebbs while the latter's health is

regained. Colour tints the cheeks of Adrian, which signals the smooth flow of blood in his body, whereas Verney—spectre-like—becomes "painted with the hues of ill health" (74). A similar sequence unfolds when Idris accompanies Verney, who has fallen ill with a fever, as the plague sweeps through England: "For three days and nights Idris had not moved from my side [...] she kissed my closed eyes and pallid lips, and pressed my stiffening hands to her beating heart" (342). Idris's devotion to Verney is precisely captured in the feeling of her heartbeat, which expresses Idris's desire to transfer her own health and vigour into Verney's veins. Yet, when Verney regains consciousness and life, her body convulses and "a stream of blood ... gushed from her mouth"; "the vessel, which had broken from the effects of extreme agitation, did not entirely heal, but was as a channel that drop by drop drew her the ruddy stream that vivified her heart" (343). This visceral and detailed image of a ruptured blood vessel illustrates that such selfless devotion manifests as a wound in her own body which has now lost its vital fluid. The fact that her vessel could not heal entirely warns of her eventual death and the need for Verney to establish new relations when plague has diminished most of the human population, including his family members. However, at this moment, Verney remains hopeful and exhibits renewed health to an extreme degree:

> ...health spent her treasures upon me; as the tree in spring may feel from its wrinkled limbs the fresh green break forth, and the living sap rise and circulate, so did the renewed vigour of my frame, the cheerful current of my blood, the new-born elasticity of my limbs, influence my mind to cheerful endurance and pleasurable thoughts. (Shelley 344)

Each part of him, from his frame to his blood and limbs, is renewed with energy and vitality. The subtle gesture to sap reminds one of the connections between blood and sap circulation that were

addressed in the previous two chapters. This is the only instance that Shelley refers to sap in this novel, which foreshadows the more ecological forms of circulation that will take the place of human interactions as the plague collapses the structures of society and relationships. Blood itself changes in terms of its meaning and Verney comes to detest his own healthy constitution when both Idris and his son Alfred pass away: "But death does not come at the bidding of the miserable. I had lately recovered from mortal illness, and my blood had never flowed with such an even current, nor had my limbs ever been so instinct with quick life, as now" (357). Amidst the ravages of plague, there are fewer and fewer individuals with whom to share one's feelings. The fact that Verney is at the pinnacle of health, with his hyperboles of "never" and "ever," loses its meaning and significance. However quickly his blood moves, no beats are echoed back in response. Even England, "The overgrown metropolis, the great heart of mighty Britain, was pulseless" (261).

**A Heart that Reaches Toward the Reader**

In a plague-stricken society, the heart must reach elsewhere, and Verney's body propels him to write to a literary counterpart: the reader. Readers are a central concern for Verney and, as Paley makes clear, there is an emphasis on the act of writing and the problem of finding a readership in Shelley's novel (120). Verney occasionally imagines a living reader for his text, whereas in other cases he characterizes himself as an instructor or historian (120-121). Moving in a different direction from Paley's analysis, I assert that Verney's heart, which suffers from the loss of human connections in his dire present, drives his writing process and his hopes of reaching an audience that resides in the future. Writing is a fundamentally social endeavour for Verney: "I found another and a valuable link to enchain me to my fellow-creatures" (157). The

image of words as chains highlights the strength and security of such bonds that link together different individuals. Even when plague undermines the significance of all human arts and Verney laments that "To read were futile—to write, vanity indeed" (308), he nonetheless continues to pen his narrative to an imagined audience. Specifically, the force of his heart compels him to write: "The same yearning of this warm, panting heart, that has made me in written words record my vagabond youth, my serene manhood, and the passions of my soul, makes me now recoil from further delay. I must complete my work" (239). Verney's "yearning"—the longing and desire for something often outside of oneself—mirrors the longing felt by Percy Bysshe Shelley's characters in the previous chapter as they hoped that their emotions would be conveyed to others. The whole body convulses—"recoils"—from the thought of pausing his work or leaving it unfinished and untethered. Not only does this suggest that the body is imbued in creations of art, but also that blood seeks to foster and forge these new relationships between authors and readers. Indeed, Verney often gestures toward the reader directly and expresses care toward the reader's well-being. He decides that he will forego the gruesome details of death and decay common to the narratives of Boccac[c]io, De Foe, and Browne (267). At other times, he fears that the reader will tire if he narrates all the details of their journey from Paris to Geneva (399). In particular, he imagines the ill effects on the reader's body should he include such details: "If I were to dissect each incident, every small fragment of a second would contain an harrowing tale, whose minutest word would curdle the blood in thy young veins" (399). In short, he fears that he will harm the readers with his words, and cause fright and anxiety within their bodies and blood. With these references to the reader, Verney remains hopeful that he is connected to a consciousness separated only by time and space. Indeed, he yearns to communicate the innermost feelings of his heart to the reader: "O, worn and

beating heart, may I dissect thy fibres, and tell how in each unmitigable misery, sadness dire, repinings, and despair, existed?" (465). Here, this apostrophized dissection, unlike the dissection of animals, does not give way to information about the speaker's body, but instead each fibre will "tell" and reveal the emotions that he felt through his experience. Writing is painted as a process of self-excavation and self-dissection, in hopes of reaching others. Just moments after he dedicates his work to "the illustrious dead," he clings to the possibility that "this world will be re-peopled" (466). The word "re-peopled" is key, for Shelley's construction of plague is unique in that it targets only people, while leaving the rest of nature, including animals and flora, healthy in their constitution. Apart from the last man, humans slowly fade whereas animals persist.

**The Self and the Animal, Mirrored**

From the year 1812 onwards, both Percy Bysshe Shelley and Mary Shelley took up vegetarian diets (Clark 70), and therefore the two were already considering the position of animals in relation to human society. Percy primarily wrote essays that outlined the dangers of a meat-filled diet and the inhumanity of game laws, namely "A Vindication of Natural Diet," "On the Vegetable System of Diet," and "On the Game Laws." On the other hand, I argue that Mary took a more subtle approach to the issue and suggested that forms of human-nonhuman bonding, supported by the anatomical similarities between humans and animals, could take the place of more harmful practices. She traces Verney's development throughout the narrative, as he moves from detesting his animal qualities to seeing connections between different species, then he makes attempts to caress and bond with them at the end. In the beginning, Verney wanders through the forests of Cumberland, steals livestock, poaches birds, and lives a life of violence.

Therefore, he aligns himself with the animal in wholly negative terms, such that he represents his encounter with Adrian, who himself never sported and only watched the animals from afar (24), as a necessary step toward humanization: "I was rough as the elements, and unlearned as the animals I tended. I often compared myself to them" (14). Adjectives such as "rough" and "unlearned" reveal that Verney rejects his closeness to the natural world and views himself "as uncouth a savage as the wolf-bred founder of old Rome" (14). He reiterates this point several times. He spends time in the county jail because he stole animals together with his comrades, yet "[b]read and water did not tame [his] blood" for "[his] life was like that of an animal, and [his] mind was in danger of degenerating into that which informs brute nature" (17, 18). Shelley brings forward the image of blood in order to illustrate that Verney sees his animal blood, and by extension his animal nature, as beastly and wild. Despite being a young boy, he ironically traces his development as one of degeneration rather than growth. When Adrian comes to visit Cumberland, Verney intentionally poaches the birds again and again before meeting Adrian in a terrifying state: "My garments were torn, and they, as well as my hands, were stained with the blood of the man I had wounded; one hand grasped the dead birds—my hard-earned prey, the other held the knife" (25). His torn garments and soiled hands evince violent tendencies and rash behaviour, as his body is marked with the blood of both animals and humans. Only after Adrian speaks to him and stirs his life-blood does Verney assert that he "began to be human" (26, 29).

At this point in the novel, Verney hopes to draw away from animals in order to become a superior, well-learned, and well-read human being. The tendency to cast the animal as a bloody beast is ironically and paradoxically found in the writings of Percy Bysshe Shelley who supported vegetarianism and warned against harming animals through blood sports. In a profoundly gruesome way, Shelley challenges the consumer of animals to attempt to "tear a

living lamb with his teeth, and plunging his head into its vitals, slake his thirst with the streaming blood" ("Vindication" 13). Indeed, Shelley emphasizes the fact that "[m]an resembles no carnivorous animal" ("Vindication" 13). For Shelley, certain passions that turn man into "a beast of blood" are derived from "their physical constitutions" ("Vegetable System" 147, 150). Therefore, when man consumes a diet consisting of roots, the gentler feelings that result will prevent their participation in blood sports ("Vindication" 16). Christine Kenyon-Jones is right to assert that while individuals in the Romantic period realized that "animals and human beings were likely to share a biological heritage[,]" they attempted to express kindness toward animals precisely, and paradoxically, "in order to show how *different* from 'beasts' they were" (4, emphasis in original). Kenyon-Jones draws on Percy Bysshe Shelley as a key example of this duality: "the very process of showing such humanitarianism can be seen as one which distances the human from other species" (112). The view that animal and animal blood were lowly continued to persist in the public imagination in the nineteenth century, despite the fact that the blood transfusions in the seventeenth century contended that "the blood of young calves and lambs was purer than human blood, less tainted by human passions and vices" (Guerrini, *Experimenting* 41). After all, regardless of the potential connection between animals and humans, many experimenters of the long eighteenth century continued to dissect and vivisect animals, as Haller believed that pain was necessary to scientific progress and Hales only ceased his experiments because he found it disagreeable, without caring for the animals themselves (Guerrini, "Animal Experiments" 71). In terms of more imaginative constructions of animals, the duality of positive and negative traits was central to various texts. For instance, Perkins provides the example of Samuel T. Coleridge's representation of a donkey; on the one hand, donkeys signified "patience, humility, lowliness, and suffering that find favor in heaven" while on the

other, these animals were seen as foolish and stubborn (110). In both literary and scientific circles, animals remained an ambiguous topic. As Guerrini writes, from 1824 to 1825, "the British debate on the use of animals remained unresolved, and issues of priority, nationalism, class and the meaning of science overshadowed the fate of the animals" ("Animal Experiments" 82). In *The Last Man*, Shelley rethinks the blood ties between humans and animals in order to emphasize the social dimensions of care of both groups.

When humans begin to perish while nature remains unaffected by the global plague, Verney draws on the positive qualities of different animals, even the minutest organism such as an ant. He casts humankind as ants on a hill; although the hill may dissolve, one day the ants will reemerge as markers of resilience and persistence (316). He moves toward Salt Hill one day and "met troops of horses, herds of cattle, flocks of sheep, wandering at will" with little concern for the humans around them and even taking "possession of a vacant cottage" (310). Different animals have taken over now that humans have deserted their homes, structures, and architecture. Within the woods near the hill, Verney spots a robin red-breast that had fallen from the trees, "its panting breast and half-closed eyes shewed that it was dying" (311). He quickly picks it up and nurses it back to health:

> I took it up and placed it in my breast. I fed it with a few crumbs from a biscuit; by degrees it revived; its warm fluttering heart beat against me; I cannot tell why I detail this trifling incident—but the scene is still before me; the snow-clad fields seen through the silvered trunks of the beeches,—the brook, in days of happiness alive with sparkling waters, now choked by ice—the leafless trees fantastically dressed in hoar frost—the shapes of summer leaves imaged by winter's frozen hand on the hard ground—the dusky

> sky, drear cold, and unbroken silence—while close in my bosom, my feathered nursling lay warm, and safe, speaking its content with a light chirp[.] (Shelley 311)

The gentle caress signals a stark and direct contrast to Verney's earlier behaviour of terrorizing and killing the birds near Adrian's dwelling. Here, there are no injured and bloodied birds. Instead, their hearts are united in this tender embrace and Verney takes care that the "warm fluttering heart" revives and beats; this very beat carries forward the memory that flows like a series of vignettes, much like a stream of consciousness, into his mind and onto the page. The shuttering snapshots of different images, one merging into the other through the long dashes, creates an expansive scene that eventually draws back to the bosom, the heart, and the bird at rest and chirping with joy. This is a rare instance of syntactical flow that Verney employs to emphasize the association of thoughts, moving out from the heart and back again, as a pattern that mimics the heart's systole and diastole. Soon after, Verney gains hope to continue moving forward despite the ravages of plague (312). Upon experiencing the deaths of both Adrian and Clara, Verney's last family members, he wakes up alone and laments "How dreadful it is ... to receive as a good morrow the mute wailing of one's own hapless heart" (447). Indeed, the heart beats yet paradoxically remains "mute" much like Keats's speaker's icy silence because it struggles to reach a listener, a companion with whom to converse and relate. Once again, Verney turns toward the animal species for solace and outlines the similarities between humans and animals: "Live on, ye innocents, nature's selected darlings; I am not much unlike you. Nerves, pulse, brain, joint, and flesh, of such am I composed, and ye are organized by the same laws. I have something beyond this, but I will call it a defect" (Shelley 459). No longer disgusted by his connection to animals, he sees them as part of the same world and system, and even views the human mind as a defect. He lists their shared anatomical parts, one of which is the "pulse," all of

which illuminates Merleau-Ponty's concept of "flesh" as that which exists between bodies (142). Furthermore, when Verney attempts to approach a family of goats and yet is attacked by the male who suspects danger, Verney almost returns to his violent ways but halts: "I snatched up a huge fragment of rock; it would have crushed my rash foe. I poised it—aimed it—then my heart failed me ... my very heart bleeding and torn" (460). He feels distraught and in pain, as if someone had dissected his heart, now without relations and in solitude. Shelley demonstrates that while Verney's new social understanding encompasses a gentler attitude toward animals, it is not a linear development, but instead oscillates back and forth. Significantly, she presents the animals as conscious beings that reject his advances and reveals that human-animal relations or bonds are not automatically made at the convenience of human beings. In response, Verney sees the wild aspects of nature as the enemy (460), yet on his final journey he is joined with a dog.

A crucial point that loops the narrative back to the beginning is Verney's encounter with the shepherd dog toward the end of the novel, as he began the novel with a shepherd dog at his side as well (468, 14). As Strang asserts, the singular title of the novel is misleading as its narrative presents "the politics of common life [and] in the end, the supposedly singular Last Man will have a dog by his side" (409). The appearance of the dog brings a slightly hopeful note to this otherwise "pessimistic novel" since, apart from the fact that the dog continues to herd sheep in the way that humans have taught him, "there is the possibility of more than one living, humanized creature surviving the future" (427, 428). According to historian Keith Thomas, pet-keeping became more widespread among middle-class individuals starting from the early modern period, such that animals began to become associated with intelligence, personality, and morality (119). For instance, "many ... of those who wrote on behalf of animals in the eighteenth century were, like Pope or Cowper or Bentham, persons who had themselves formed close

relationships with cats, dogs, and other pets" (119). Thomas draws attention to the fact that during the seventeenth century, people were attached to sheepdogs due to their exceptional skills (102). Furthermore, dogs were faithful, and pets in general "were company for the lonely, relaxation for the tired, a compensation for the childless" (118). This rings true in Shelley's novel, where dogs are recurring figures that become intertwined with their owner's identity and remain devoted to their owner until death. In fact, when Lord Raymond dies in Greece, his daughter Clara recognizes his dog Florio, who guides both Verney and Clara to Raymond's "mutilated form" before dying beside his lord (206). Florio becomes an extension of Raymond that helps the two locate his body amidst the ashes and the dog also perishes alongside his master, as if they shared their life. During another scene, Adrian saves an orphaned girl, "followed by a large Newfoundland dog," who reassures him that she is not alone because "Lion is with [her]" (333). When human relations perish, these animals remain linked to their owners and soothe their loneliness by giving them hope. In a similar vein, Verney's final journey is not in complete solitude either. Just as he assisted a local farmer with a shepherd dog during his early years in the forests of Cumberland, he finds a similar relation in Italy toward the end of the novel: "My only companion was a dog, a shaggy fellow, half water and half shepherd's dog, whom I found tending sheep in the Campagna" (467). When the dog spots Verney, he becomes active with energy and joy:

> He sprung up to my knees; he capered round and round, wagging his tail, with the short, quick bark of pleasure: he left his fold to follow me, and from that day has never neglected to watch by and attend on me, shewing boisterous gratitude whenever I caressed or talked to him. His pattering steps and mine alone were heard[.] (Shelley 468)

Verney and the dog share a reciprocal exchange, as the dog watches over the last man whereas Verney not only embraces him, but also communicates with the animal. Their steps, which signal the synchronization of their bodies much like the beating of two hearts, blend together and echo across the barren landscape of a posthuman world.

**Conclusion**

As blood flows within the bodies of Shelley's human and nonhuman characters, Shelley demonstrates that even when societal structures have collapsed—perhaps especially then—humans will find other ways to maintain a sense of relationality with the world. As blood becomes vacated of its common connotations of family, royal lineage, insularity, and aristocracy, it stretches to bring together humans with animals and those of the present with readers in the future instead. There is a sense that the blood within human bodies is able to synchronize with the fluids found in other animals and entities. Furthermore, the written or spoken line becomes a bodily line which carves out relationships between different organisms, species, and generations. Such lines are not ones of separation or segregation, but rather inspire a togetherness and intermeshed existence of body and environment.

# Conclusion

## From Spinoza to Blake, Another Worm Appears

I began this thesis with a quotation of a worm suspended in blood, which represents the human point of view, by Spinoza. Now, I end with another quote—this time from Blake—with the worm as its central image as well: "Consider this O mortal Man! O worm of sixty winters said Los" (*Jerusalem*, Plate 30: Line 57; E 177). According to S. Foster Damon, Blake's worm represents limited views, restrictions, and a narrow life that focuses solely on the body and sexuality (451). Therefore, Blake's goal is to reach a point—through refashioning literature and the mind—where all creatures, including the seemingly lowly worm, are free and infinite. Yet, by comparing the worm to a human, Blake already makes a connection between the human and nonhuman worlds, which foreshadows more flexible perspectives later on in his narrative. Even Spinoza himself claimed that humans, with their blood circulation, can take on different shapes in life (342).

Worms also come to the fore in Jane Bennett's text, where she brings attention to Darwin's experiments. He observed these worms, "watched how they moved, where they went, and what they did, and, most of all, he watched how they made topsoil or 'vegetable mould'" (95). In Darwin's view, "worms inaugurate human culture and then, working alongside people and their endeavors, help preserve what people and worms together have made" (96). Bennett concludes by bringing together Darwin with Hans Driesch in order to emphasize the power of small organisms such as worms:

> Their actions are neither an expression of divine purpose nor reducible to an unvarying mechanical instinct. Let us call the assemblage in which these wiggling actants participate not (as in Baruch Spinoza) God or Nature, but History or Nature, or, to be

> more precise, British History or England's Nature. This assemblage is an ecology in the sense that it is an interconnected series of parts, but it is not a fixed order of parts[.] (97)

Indeed, these creatures circulate materials in the earth and push forward the cycle of decay and renewal. They move, crawl, and work—often hidden from the human eye—but their effects are felt all around the environment. For Bennett, they mirror "the act of persons dragging their belongings to their new homes" (98). It is striking how the flexibility of these small organisms mirrors the potential flexibility that we can give our hearts. As Alberti writes, in the twentieth century, it is possible to change hearts with another person, in contrast to brain parts which are more difficult to transfer (155-56). This relationality of the heart can be powerful, especially in a world separated by COVID, a world that is recently coming together again. How can our bodies respond in a subtle manner? How can hearts synchronize and empathize despite the distance?

**Chapter Summaries**

Taken together, the works of Blake, Percy Bysshe Shelley and Mary Shelley, and Keats illustrate the flexibility of biological figures such as the heart and blood and show us that they can represent social ties with both other humans and other nonhumans. Blake's two poems bring to light the creativity and recombinations inherent to the field of chemistry, pertinent even to a mechanist like Boerhaave, and how that creative potential can and should be applied to bodily substances like blood. Interdisciplinary tools like the furnace only further this point of relationality. In the chapter on Shelley and Keats, blood circulation intersects with water cycles and sap movement in order to project a network that knits together both human and nonhuman movement. Finally, in Shelley's *Last Man*, we see a narrative where the protagonist confronts the

falling structures of man-made society and decides to reach out to both animals, and a future reader, in hopes that they may feel the struggles of his tormented heart.

**Final Considerations**

A worm of sixty winters is a short life. Now, even though life expectancies in certain countries are longer, the human lifespan is still shorter than that of most animals and microorganisms. For that reason, I suggest that we must find new ways of seeing and being in this short life, and to find the infinite located in the finite (Nersessian 19). In short, I ask how can literature act as the equivalent of CPR for the human mind and body? The hands of another individual come together in order to mimic the pumping motion of the heart, which in turn allows for the flow of fluids to move again. This movement, much like my “bio-ecological” view of blood, comes from without, but is nonetheless essential to continuing the life of the injured body.

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