Chapter One

Impossible Economies: Theories of Non-Productivity in Victorian Contexts

This dissertation is about a set of key paradoxes in Victorian thought. In general terms, it defines a series of interlocking mental habits at mid-century, and maps the diverse deployments of those habits in contemporary locations of knowledge. My focus resides with several formative scientific studies that I read alongside parallel developments in the realist novel, moral philosophy, and social critique. But my main purpose in doing so is not to re-construct the lines of a distinct disciplinary formation so much as to recover a richer range of cultural confluences and epistemic patterns. More precisely, I discuss the ways in which major Victorian texts understood the shifting boundaries between the individual and the group—and, namely, the breakdown of cooperative bonds. Whereas older norms of natural explanation had emphasized the reciprocal relationship between part and whole, in keeping with the watch-like regularities promulgated by natural theology, these texts turned time after time to the function of the prodigal part--the exception that failed to signify within the larger life of the group. This emphasis held equally true in theories of human bodies, of communities, and of the created cosmos at large. To inquire into the natural order, in this context, was to note the recurrence of those elements which were wasteful or otherwise non-productive within the orderly operations of the whole. The paradoxes that emerged

among this state of affairs, and their relation to the formal and perspectival patterns of the novel, form my central concerns in the chapters to follow.

In particular terms, then, the dissertation deals with a distinctive epistemological turn: the emergence of non-productive or "diffusive" systems in British prose. Far from productively re-incorporating waste, such systems were defined by patterns of insuperable disorder over time. I situate these models of non-productivity in terms of science (in the developing domains of natural inquiry) and aesthetics (in the patterns and purposes of the multiplot novel). To be sure, these texts turned upon figures which were counter to the productive operations of an organism. But with routine regularity, those figures provided the very grounds for more roundabout routes of influence and inspiration. The effect, I argue, was to destabilize many structuring oppositions in Victorian thinking: between fertility and infertility, progress and postponement, order and dispersion. Displacing patterns of perfect reciprocity, these texts suggested how forms of systemic breakdown might actually release the potential for positive improvement.

Thus conceived, the dissertation questions a commonplace myth about Victorian thought: that novelists invoked naturalistic notions of order against the specter of social disaggregation. Much to the contrary, I argue, models of non-productivity provided a new foundation for imagining moral and social progress. I turn to three particular points of scientific inquiry within this context. First, I consider the paradoxical persistence of non-reproductive sexualities (the evolution of sterile organisms). Second, I turn to the quantification of sensory delay (the measurement of the exact velocity of the nerves). Third and finally, I analyze the discovery of cosmic dissipation (the ineluctable loss of energy in the universe). These theories emphasized phenomena that appeared prodigal

and purposeless, in every case contrary to ordinary physical and life processes**.** Yet, I want to resist the impulse to read these theories as symptoms of larger social anxiety, for such concepts were absolutely central to the Victorians' efforts to imagine a regenerated society.

As writers explored the meanings in non-productivity, they were drawn to several specific paradoxes at the heart of British society, relating to sexual, economic, cognitive, and affective characteristics. Why, as Charles Darwin would ask in the 1840s and after, did nature preserve and in fact foster sexually infertile figures? In other words, how could these individuals make social contributions without recourse to the powers of personal legacy? Likewise, in the realm of cognition and sensation, the discovery of sensory delay in 1852 posed new problems and produced new possibilities for social thinking, especially as medical authorities began to characterize delay as a distinctive new problem in industrial life. How could physiological postponement serve as a basis for more expansive, fully realized relations in society, rather than function as an impediment to them? A third paradox involved the erosion of energy itself—that is, the theory of entropy. While energy lost its capacity to perform productive work, scientists found, it continued to circulate within the universe at large. To what extent could the fact of cosmic decay become consistent with organic growth?

It is central to my purposes to show how the symbolic potentials of non-productivity, in Victorian science, were bound up with the formal and political premises of the realist novel. In particular, all of the novels that I address are linked by a common concern with the individual exception—that is, the aberration which failed to fit within the productivist logic of the group. Whereas older organicist thinkers held that no

individual could be abstracted from the larger life of the whole, these fictions enlisted new scientific theories to show the very value of such anomalous agents themselves. As I shall show, these exceptions served to render that logic visible and available for critique. In my readings of Charles Kingsley, Charles Dickens, Wilkie Collins, and George Eliot, then, I focus upon characters who fail to contribute to the group and appear antithetical to its progress. So, for instance, chapter two traces a common constellation of ideas about sexual non-productivity in Dickens and evolutionary biology, focusing upon Dickens's representation of the bachelor in *Dombey and Son* (1848) and Darwin's developing interest in the recurrence of sterile subjects. While these subjects failed to find reproductive partners, their sexual renunciations released the potential for more mediated and roundabout routes of influence within the community at large. To be sure, Dickens's bachelors appear in ostensible opposition to the main marriage plot, and do not produce progeny of their own. But the major work of the novel is to undo this apparent polarity between reproductive and non-reproductive relationships, positioning these exceptional figures as vital to the union of the romantic couple--and, with them, to the future life of the community as a whole. These exceptions appeared apart from the reproductive logic of the group, but, as Dickens and Darwin would suggest, they preserved their traits of sympathy and self-sacrifice through the preservation of close relations. Like Jarvis Lorry, who serves as a personal friend to Doctor Manette and his daughter Lucie in *A Tale of Two Cities* (1859), the two bachelors in *Dombey and Son* prove paradoxically productive to the future life of the community. Defined as evolutionary "dead ends" and devoid of personal legacies, they still possess powerful vitality at the level of the greater aggregate.

The trajectory of my argument begins with the intellectual legacies of natural

theology in the later 1840s, and with writers' declining faith in the essential stability, intelligibility, and coherence of the cosmic order. Concentrating upon the writings of the Anglican minister and reformer Charles Kingsley, and his social protest novel *Alton Locke* (1850), I attend to the tensions latent within established Christian cosmologies at the time. While working to reveal God's laws to ordinary workers, Kingsley's sympathy with the plight of the poor led him towards a different view, so as to stress the very inefficiencies and flaws in natural design. Even as his novel seeks to affirm the integrity of God's plan, then, it turns out to emphasize precisely its failures of fit. *Alton Locke* serves as a point of origin for my larger purposes insofar as it implies both the horizons of natural theology and a simultaneous shift toward new notions of excess and exceptionality in natural design. Departing from earlier accounts that could comprehend signs of disorder only as indications of greater coherence, subsequent British thinkers took up the nature and effects of such signs everywhere in the world. The subsequent chapters chart the vicissitudes of this shift, and show how, for many Victorians, the very imperfections and flaws in natural forms could create the conditions for moral and political amelioration.

In its account of non-productivity in Victorian fiction, the dissertation offers a larger contribution to the history of aesthetics, specifically by showing how the realist novel laid a foundation, at mid-century, for subsequent aestheticist theories about the purposelessness of art at the fin de siècle. For example, chapter three discusses the ways in which the endlessly hesitating hero of Wilkie Collins's *Armadale* (1866) provided a way of positioning the novel in contrast to emergent epistemologies of efficient labor, just as the two bachelor figures in Dickens's *Dombey and Son* suggested alternatives to

established economies of patriarchal (re)production. Taken together, the following chapters argue that discourses of non-productivity presented powerful stimuli for new, Arnoldian assumptions about the autonomy of art in the 1860s and 1870s. But they did so in ways which negotiated between those assumptions and earlier, established arguments about the novel's political purpose. Ironically enough, the very failure of the novel to intervene in contemporary circumstances could result in even more widespread patterns of influence. However far removed from particular political events, a novel could still resonate in ways which were, in the words of George Eliot's narrator in *Middlemarch*, "incalculably diffusive" (837).

The term "diffusion" captures the diverse meanings of non-productivity that this dissertation seeks to address—respectively scientific, social, and stylistic in nature. Signifying first as a feature of expressive form, it was not until relatively late in its history that "diffusion" circulated into scientific and other social arenas. The *Oxford English Dictionary* associates diffusion with "prolixity" and "copiousness of language" (*OED n.*4) from Geoffrey Chaucer onward. Only in the nineteenth century did its other, scientific meanings take shape, beginning with John Dalton's 1808 chemical theory of the diffusion of gases, and, later still, in the second law of thermodynamics, the theory of entropy (*OED n.*5). In the latter part of the century, the term flowered further still as a model of cultural influence, so as to signify "[t]he spread of elements of a culture or language." (*OED n.*3b). As E.B. Tylor wrote in his influential *Primitive Culture* (1871), "[h]ow good a working analogy there really is between the diffusion of plants and animals and the diffusion of civilization."[1] In each of these uses, diffusion signified the breakdown of unitary forms—of words, of objects, of cultures—from standards of

internal cohesion, pointing to their progressive departure from a shared source or significance.

At the same time, it should be clear that I do not aim to present a discursive history of the term "diffusion" itself, but rather to reveal the more culturally pervasive habits of thought that the term suggests. As a figure for novelistic form, diffusion suggests the "spread of elements"—of characters, concepts, and themes--lacking any clear focal point or interconnection. In scientific theory, the term implies the distribution of molecules, energies, and motive forces away from central, controlling sources. And in social arenas, it suggests the proliferation of ideas and influences far from their original contexts of production. Thus understood, the metaphor of "diffusion" is important to me because it offers a general figure for Victorian concepts of functional breakdown. In lieu of a linear history of influence, absorption, and appropriation, then, the dissertation offers four case studies within a much larger set of cultural conversations between these discursive arenas.

While each of the novels that I consider sought to bring about a reformed society, the solutions they offered existed on a sliding scale between the two extremes of the individual and the social. Where Dickens attempted to arrive at more communal model of amelioration, his friend and literary protégé Collins sought to situate social change at the level of the isolated self. And departing from both of these writers, George Eliot sought to marry the aims of the self and the social together. As the final chapter shows, Eliot is interested in the breakdown of sympathetic exchange, and focuses upon the affairs of the individual apart from the greater group—most famously in *Mill on the Floss* (1860) and the figure of Maggie Tulliver. But in her later fiction, her interests led her to imagine the

continuing afterlife of sympathetic impulses beyond their immediate, personal contexts. In fact, for Eliot, the very failure of personal sympathies and cooperative impulses could release the potential for widespread social change. Just as scientists suggested the continuing existence of energy after it lost the ability to perform productive work, Dorothea's ardor continues to circulate in immeasurable, albeit more widespread ways in the wider world of *Middlemarch* (1872). By situating the individual exception within this continuum of social concepts, I seek to convey the heterogeneous nature of the solutions that novelists envisioned. For Eliot and others, the exception did not mark a monolithic signifier of malaise so much as a rich range of potentials for social thought.

Taken as a whole, the dissertation seeks to chart a haphazard Victorian project to produce a renewed nation from the fact of a fatally non-productive universe. These theories were "diffusive" in the sense that they represented the breakdown of direct, dyadic relationships—above all, in ideals of contractual exchange—and, in another sense, because they suggested how such failures facilitated the continuing circulation of agency and influence in more mediated, wayward, and roundabout routes within the social system at large. All of my chapters center upon these impossible economies of loss and gain. Departing from recent critical emphases on models of organic unity, I show how many mid-Victorian scientists and non-scientists sought to theorize the nature and effects of incalculable diffusion.

I. Failures to Produce and the Production of Failure

As a general cultural concern, the failure to produce could signify in a range of different Victorian arenas: not only in the realm of sexual reproduction, but also in ideas of money and material goods, of friendship and personal feeling, and, not least, of

literature itself. One notable reference point can be found in Thomas Malthus's *Essay on the Principle of Population*, which went through six British editions between 1798 and 1826. Malthus's work expressed profound skepticism about the dominant strain of eighteenth-century philosophy that saw Europe as improving and potentially perfectible. He sought to point out the contradictory logic within contemporary standards of social progress. The two goods of population growth and the growth of sustenance, Malthus argued, increased at inherently different rates, leading to the incidence of widespread starvation, disease, and mortality. Checks on population were important to generate social progress without unnecessary death or disease. Far from signs of social collapse, these checks were in fact fundamental to society's continuing existence. He explains:

> The vices of mankind are active and able ministers of depopulation. They are the precursors in the great army of destruction, and often finish the dreadful work themselves. But should they fail in this war of extermination, sickly seasons, epidemics, pestilence, and plague advance in terrific array, and sweep off their thousands and tens of thousands. Should success be still incomplete, gigantic inevitable famine stalks in the rear, and with one mighty blow levels the population with the food of the world.[2]

"Vices," "destruction" and sickness should be seen as sacred officers of order, not their putative opposites. Whereas other thinkers saw high fertility as self-evidently advantageous, since it would increase the total number of laboring bodies, Malthus saw things in another light. The increase of laboring bodies did not necessarily result in increased overall output; rather, these increases were actually detrimental to the social system. Accordingly, checks to population—those spectacles of mass suffering and devastation—were not signs of disorder, but rather of a return to equilibrium.

Malthus's sense of the tension between two apparent goods—the growth of fertility and of food—marks a prevalent Victorian interest in patterns of organic

breakdown. While preceding the writers that I address, his interest in the value of non-productive phenomena resonated with nineteenth-century intellectuals such as David Ricardo, William Paley, and, most notably, Charles Darwin, who drew upon Malthus's ideas in his theory of natural selection in *Origin of Species* (1859). In an assortment of other religious and philosophical contexts, signs of social decline were interpreted in salutary ways, as well. In *Principles of Political Economy* (1848), John Stuart Mill set forth a similar point of view. "It is scarcely necessary to remark," writes Mill, "that a stationary condition of capital and population implies no stationary state of human improvement."[3] For Mill, forms of moral improvement happen only when the immediate needs of day to day life reach a point of equilibrium. He explains, "[t]here would be as much scope as ever for all kinds of mental culture, and moral and social progress; as much room for improving the Art of Living, and much more likelihood of its being improved, when minds ceased to be engrossed by the art of getting on" (3:221). For both Mill and Malthus, social stagnation was consistent with "social progress." Just as Malthus came to reconcile patterns of stability and upheaval, death and development, Mill would locate improvement in terms of stasis itself.

This dissertation attempts to map the scientific vectors of this larger Victorian fascination, focusing upon the two-way traffic between scientists and non-scientists at mid-century. In doing so, however, I resist the impulse to chart a single direction or degree of influence, and instead seek to recover a richer range of dialogues between scientific theory, social commentary, and novelistic forms. Thus understood, assumptions about the bachelor in Dickens, for example, can be linked to Charles Darwin's views about sexual infertility. For this reason, too, I locate these cultural conversations in a

range of fictional genres including the social problem novel, Dickensian melodrama, the sensation novel, and high realist fiction. Taking these texts together, the following chapters strive to turn attention away from figures of efficient economy in Victorian science and literature by recovering the symbolic uses of their putative opposites. Out of a disordered ideology of nature, novelists imagined the means to a regenerated society.

The texts that I consider mark a movement from the late 1840s to the 1870s--a period known traditionally as the "age of equipoise," in the phrase first popularized by the British historian W.L. Burn. Burn famously described these decades as a period in which "the old and the new, the elements of growth, survival and decay, achieved a balance which most contemporaries regarded as satisfactory."[4] With the repeal of the Corn Laws in 1846, the liberal government undertook to remove repressive legislation instituted under Robert Peel. The turbulence of the first railway boom of the 1840s was in abatement, and new technologies such as the gas lamp and telegraph became widely available to the middling classes. In this manner, the widespread optimism marked by the Great Exhibition in 1851 marked merely one of many signs of social improvement. Historians after Burn have highlighted the radical disparities and disruptions that also defined the period: the onset of the Crimean War in 1854 and the Indian Mutiny of 1857 marked two of the most visible signs of polarization. But it was difficult for British writers in the 1850s not to observe an increase of optimistic sentiment in contrast to the general condition of England in the so-called hungry forties.

While I follow Burn's stress on the interrelationship between "growth, survival and decay" during these decades, however, I wish to emphasize how writers were working to celebrate concepts of asymmetry and imbalance in society as the very basis

for imagining its growth. It was not just that signs of "decay" were balanced by the opposing forces of "growth," but that the two terms became in many cases synonymous. In fact, the breakdown of functional bonds between the self and the social, the individual and the greater group, became constitutive of much optimistic sentiment in the texts that I seek to consider. Notably, the three new scientific developments that I identify all appeared around the late 1840s and early 1850s, a historical juncture that also saw the rise of the multiplot novel. Darwin's first musings on non-reproductive sexualities appear at mid-century, while the German scientist Hermann von Helmholtz first measured the exact velocity of the nerves—and found their essential slowness—in 1852, sending ripples through scientific circles in Britain and abroad. Likewise, in that same year William Thomson announced his discovery of the downward-directed, increasingly disordered nature of cosmic energy to the British Association for the Advancement of Science. To be sure, theories of entropy—the loss of available energy in the universe—appeared throughout the 1820s and 1830s, as did many abstract speculations into sexual sterility and the speed of the nerves. But these years made those ideas much more empirical and widely available for discussion.

My interest in Victorian scientific epistemologies is shared by many recent critics, but my emphasis on theories of non-productivity remains distinctive. In recent years, seminal studies by Tess Coslett, Sally Shuttleworth, Mary Poovey, and Susan Graver have shown how the constitutive values of the multiplot novel--namely, the ideals of connection, closure, and dynamic change--were wedded to developing views about physical and physiological growth. "The image of universal organism," as Coslett observes, "has both aesthetic and moral implications. Aesthetically, the beauty of its

interconnected processes can be admired; and a moral lesson can be drawn from the interdependence and co-operation of its 'parts ' for the benefit of the 'whole'."[5] These studies have highlighted the relationship between models of organic unity and models of social improvement, but only to obscure the ways in which *non*-progressivist patterns in nature might facilitate similar sorts of sentiments. For Coslett and others, the emphasis falls upon figures of functional unity: the whole was greater than the sum of its parts, and a change in each part implied a change in the whole. To explain the rise of multiplot fiction is thus to trace a shared collection of ideas about form and function across nineteenth-century culture—the common convictions of order, cooperation, and reciprocal relationship taking shape in both British novels and in new patterns of natural explanation.

Terry Eagleton provides the classic articulation of organicism and its ideological functions along these lines. "As Victorian capitalism assumes increasingly corporate forms," he explains, "it turns to the social and aesthetic organicism of the Romantic humanist tradition, discovering in art models of totality and affectivity relevant to its ideological requirements."[6] Under the pretense of perfect social cohesion, organicist fictions conspire in the production of an exceptionless, self-policing status quo, offering fragile consolations for the empirical fact of determination. For critics such as Eagleton, the readerly satisfactions of organic order depend precisely upon the dilution and displacement of actual scenes of social conflict. Understood in this way, the task of contemporary criticism is to recuperate those historical displacements, revealing seemingly marginal moments where, in Eagleton's words, "a potentially tragic collision between 'corporate' and 'individualist' ideologies is consistently defused and repressed"

(112). By disclosing the continuing conflict between the self and the social, critics can restore representations of organic order to their original contexts of production, positioning them within a general apparatus of subjugation and control.

Subsequent scholarship by Shuttleworth, Poovey, and others has served to contextualize organicist thinking more firmly within Victorian scientific contexts, but ultimately they re-enforce Eagleton's emphasis upon patterns of latent slippage and instability. "Inconsistencies inevitably occurred, however," writes Shuttleworth, "precisely in regard to issues which the metaphor was designed to resolve: the relationship of part or whole, or individual to society."[7] These "internal contradictions" (8) are also the focus of Poovey's interest in metaphors of the British social body, as well. "[B]ecause the image of the social body carried with it assumptions about physiological and economic self-regulation" Poovey suggests, "it presented compelling concepts of corporate society, helping to remove restrictive legislation around tariffs and work houses."[8] But while fostering belief that "society was an entity that would run itself if sympathy ruled," the developing discourses of the social body worked at the same time to discipline, restrict, and control a population perceived as antithetical to it (97). "The process by which a national identity is consolidated and maintained," in Poovey's words, "is therefore one of differentiation and displacement—the differentiation of the national us from aliens within and without, and the displacement of other interests from consciousness" (55-56). While providing a spur for liberal legislation, Poovey argues, metaphors of the body politic also functioned to externalize extraneous elements such as prostitutes and the urban poor who were deemed detrimental to its overall health.

Such symptomatic readings reflect the central concerns of much contemporary

criticism. By claiming to recover the "defused and repressed" content at the heart of organicist thinking--the unresolved tensions between the self and the social--critics can confirm the rewards of a contextual history and the more general payoffs of a poststructural praxis, a method of reading defined in opposition to inherited ideas of organic form. In a distinctive double gesture, critics demystify outmoded models of corporate relationship and replace them with an alternative hermeneutic highlighting patterns of conceptual collapse. And in this sense, the value of organicist thinking resides in the "repressed" tensions and contradictions that critics can then claim to recover and realize fully in their own interpretive practices. As an ideology of perfect interconnection, continuity, and closure, models of organicism have tended to signify as precisely what contemporary criticism is not, enabling expressions of interpretive mastery over the artifacts of an antiquated past. But by reading such signs of symbolic breakdown as symptoms of what stands outside the stated ideology of the text—that is, as a basis for their distance and distinction from their objects of study--critics have obscured the internal complexities of nineteenth-century scientific epistemologies themselves. While aptly historicizing certain conditions of literary production, in other words, we have tended to reify the changing character of scientific thinking, ironically reinstating the very assumptions that these novels sought to challenge. In this way, we have perpetuated a partial and imperfect understanding of both Victorian epistemologies of science and the ways in which current critical orthodoxies continue to be imbricated in the interpretive legacies of the past. In addressing this aporia, I show how figures of non-productivity served as a basis for Victorian concepts of organic form—and, at the same time, for Victorian views about the political efficacy of the aesthetic itself.

Accordingly, I wish to build upon the formative analyses of critics such as Shuttleworth and Poovey by showing the prevalence of non-productivist patterns in Victorian scientific and social thinking. In what follows, I situate the rise of nineteenth-century theories of non-productivity from within the history of organicism itself. Namely, I focus upon the unstable relationship between the individual and the group at the heart of organicist thinking. Out of an increasingly disordered ideology of nature, I argue, Victorian writers were encouraged to imaginatively produce new possibilities for social growth.

II. After Organicism: The Natural and the Social

Concepts of organic order appeared within a wide range of physical and physiological studies during the late-eighteenth and early-nineteenth centuries. But while originating from many different disciplinary contexts, these ideas shared several basic, constitutive features. During this time, scientists shifted focus from fixed natural forms to patterns of dynamic development over time. Spurred by breakthroughs in fields such as biology, physiology, and gradualist geology, writers would lay fresh emphasis upon figures of re-constitution and cumulative change. This meant that the part and the whole were bound up in patterns of reciprocal relationship: the fate of every element was tied to the larger life of the group, and vice versa. Over the course of Victoria's reign, these theories were translated into social terms in the work of British writers such as John Stuart Mill, Herbert Spencer, and George Henry Lewes. For these socially-minded theorists, organicism meant that the self and the social were linked together necessarily. Properly perceived, the collectivist impulses of altruistic action and self-sacrifice were wholly consistent with the drives toward happiness and self-fulfillment. Thus

emphasizing patterns of interconnection and cohesion over time, organicism offered representations suited to the needs of a rapidly diversifying British nation.

But while organicist social theories were linked by several overarching principles, they resisted reduction to the terms of a single, synthetic system. Auguste Comte claimed famously, for example, that the individual was an abstraction, while his acolyte Herbert Spencer grafted organicist theories onto a general philosophy of self-pursuit. For Spencer, in direct contrast to Comte, the social whole worked to promote patterns of personal experience. "[T]he only point of community between us," Spencer noted in regard to Comte, "is the notion of a social organism."[9] These sorts of interpretive tensions were exacerbated further by conflicts within the work of individual theorists, who vacillated widely between an emphasis upon self-fulfillment and the growth of the greater social franchise.

To acknowledge the prevalence of organicist thinking, then, is necessarily to note how it served simultaneously to structure and destabilize developing ideas about social relationship. While constituting a shared language of organic order, that language developed in increasingly disparate directions over the course of Victoria's reign, giving rise to an assortment of competing, even contradictory instantiations of the organicist ideal. Time and again, the tensions between the self and the social persisted within writers' most explicit expressions to the contrary. At the same time, however, such slippages were not always proof of conceptual collapse. The interrogation of organicist concepts themselves formed a vibrant part of scientific thinking itself beginning in the 1840s and 1850s, as scientists shifted focus from the perfect integrity of the whole to patterns of inefficiency and failure. Far from reflecting the well-wrought contrivances of

a divine creator, the universe was beset by imperfections and flaws.

This section traces the rise of nineteenth-century organicisms in order to provide a context for these particular developments at mid-century. While I share with many critics an emphasis on the slippages and asymmetries in notions of organic order, my point is to show how these tensions were actually generative for other, contemporary concerns in science and popular novels. This is to say that new concepts of organic breakdown did not negate the central concerns of organicism per se; rather, they represented organicism's other side: the tensions internal to theories of organic order, as we shall see, found expression in an assortment of alternative views about the nature of animate relations. To reveal the continuing conflict between the part and the whole is not just to disclose the limitations of organicist thinking, but also to turn attention to the rise of scientific theories based around such conflicts, and to the positive potential for improvement that those theories helped to release.

The rise of organicist social concepts can be traced to several sources in the late-eighteenth and early-nineteenth centuries, including the work of German intellectuals like Immanuel Kant and Johann Fichte, British Romanticists such as William Wordsworth, Samuel Taylor Coleridge, and William Hazlitt, and an assortment of others.[10] But no writer wielded more formative influence upon organicist commentary, directly or otherwise, than the French philosopher Auguste Comte. Comte's central concern was to precipitate a new science of society. Working with groundbreaking figures of growth and change from astronomy, biology, physiology, and physics, he sought to demonstrate a natural foundation for human morality. "[I]deas of order and progress are, in Social Physics," writes Comte, "as rigorously inseparable as the ideas of Organization and Life

in Biology; from when indeed they are, in a scientific view, evidently derived."[11] For Comte, new notions about animate life could serve isomorphically as a guide for new social relations. The study of life-processes points to the potential for renewed personal relationships, just as those relationships in turn reflect the workings of the natural order.

At the center of Comte's system stood the belief that life could be located in an ongoing process of relations between the individual and the social medium. "Order and progress," structure and function, appeared ineluctably intertwined. In lieu of a separate somatic substance or vital principle--either electricity or magnetism, on the one hand, or inviolate chemical laws, on the other hand--vitality inhered in the regulative interplay between internal and external conditions. Whereas earlier scientists subscribed to the idea that a fully developed organicism was nascent in its initial stages, increasingly life was seen to develop dynamically: each element was bound up in the identity of the greater group. Theories of epigenesis--presented first by Caspar Friedrich Wolff in 1759 and subsequently by Johann Wolfgang von Goethe and Karl Ernst von Baer--conceived of embryonic growth as a process of constant differentiation as an organicism grew from homogeneity to heterogeneity; rather than a miniature model of the fully-realized form, an organism underwent a process of increasing internal complexity as it moved towards maturity.[12]

But such emphases upon patterns of inclusive change appeared in a range of other inquiries. In fields as diverse as physiology, geology, and astronomy, scientists shifted from static taxonomies to concepts of gradual historical relationship. Charles Laplace's nebular hypothesis, for example, explained the birth of the solar system out of primordial gaseous substances; the origins of the universe were defined by early

dispersion and difference, not the systematic rhythms of the present. Comte employed these theories as a means of re-envisaging social relations. Just as science dictated dynamic histories of development, so societies should move towards increasingly corporate relationships over time, in a way which would render individuals subordinate to the larger social whole. As Comte explained, "the true human point of view,--that it is not individual but social. [...] There is nothing real but Humanity, regarded intellectually or, yet more, morally."[13] The proper interpretation of human life starts at the level of the social whole, not at that of isolated individuals. He located this ideal specifically in light of contemporary science, "individuals should be regarded not as so many distinct beings but as organs of one Supreme Being."[14] A single organ cannot be abstracted from the larger life of the whole, just as theories of organicism requires each organ to survive.

Above all, Comte sought to situate moral meaning in patterns of mutuality and interrelationship through time. In some instances, however, he continued to invest value in autonomous agents apart from the group. Acknowledging the necessary protections of liberty and personal freedom, for example, he defines the social by reference to the isolated self. "All notions of public good must be based upon those of private advantage," he writes, "because the former can be nothing else than that which is common to all cases of the latter."[15] What is "common" turns out to be precisely the powers of "private advantage"; paradoxically, collective social harmony has origins precisely in relation to what it is *not*. "Inconsistencies inevitably occurred [in organicist thinking]," writes Shuttleworth, precisely in regard to issues which the metaphor was designed to resolve: the relationship of part to whole, or individual to society."[16]

The complexities of Comte's vision reverberated among many subsequent social

theorists in Britain. In a series of letters between Comte and John Stuart Mill between 1841 and 1846, for example, Mill confessed Comte's influence in liberating him from Benthamite economics and in inaugurating a new, scientific basis for morals.[17] Mill's *System of Logic* (1843) returned repeatedly to Comtean models of organic order, particularly as a means of theorizing the scientific progress of social institutions. The epigraph to book six (in a passage later reprinted in George Henry Lewes's articles on Comte's philosophy) comes directly from Comte:

> So long as individual minds do not adhere together from a unanimous agreement upon a certain number of general ideas, capable of forming a common social doctrine, the state of the nations will of necessity remain essentially revolutionary. [...] It is equally certain that, if this union of minds, from a community of principles, can once be obtained, institutions in harmony with it will necessarily arise without giving room for any serious shock.[18]

For both Comte and Mill, "individual minds" found fulfillment only in a larger "union of minds," a "community" premised upon common moral principles. "There is no social phenomenon," Mill explained, "which is not more or less influenced by every other part of the condition of the same society."[19] In fact, Comte's "community of principles" found expression in what Mill called a "unity of interest" (to be elaborated further in what Spencer subsequently called a "fundamental community of opinion" and George Eliot a "community of interest" in the 1860s.[20] As in Comte's system, "the completeness of social union" can come about by subordinating "selfish propensities" to a "common system of opinions."[21] Far from seeking formal rights, social reformers should instead work to change the informal affective bonds between individuals. New social institutions depended first and foremost upon a transformation in feeling; a shared sympathy, in other words, would create the conditions necessary for a consummately reformed social order.

In this manner, Mill's early philosophy presented a self-conscious extension of

organicist social concepts. But while working from Comtean models of organic unity, Mill became increasingly ambivalent about the place that Comte accorded to autonomous agents in them. In his more mature writings, Mill moved to uphold the prerogatives of personal liberty against an encompassing state power.[22] "[H]uman beings in society," Mill explained later, "have no properties but those which are derived from, and may be resolved into, the laws of the nature of individual man."[23] Far from espousing the values of the greater group, "the laws of nature" reflect those of isolated individuals. Mills's reservations found fuller expression in *Auguste Comte and Positivism* (1866), which addressed the authoritarian aspects of Comte's philosophy at length. "Liberty and spontaneity on the part of individuals," Mill laments, "form no part of the schema." Given its absence of any concept of personal privilege, Comte's system is seen to suggest "what happens when once men lose sight, in their speculations, of the value of liberty and of individuality."[24] For this reason, Comtean concepts remain inadequate to the truth of social experience. "Comte has got hold of half the truth, and the so-called liberal or revolutionary school possesses the other half," Mill explains.[25] If Comte correctly calls attention to the benefits of corporate society, then Mill critiques his tendency to marginalize the individuals that constitute it as such.

The disagreement between Comte, Mill, and others turned upon a single, seemingly insurmountable question: to what extent did the social whole govern the life of the individual, and vice versa? As Susanne Graver remarks, "the criterion of telos exposes as hollow or facile the natural and necessary harmony between the individual and the social organism that was supposed to be created simply by locating a center both within and outside of the self."[26] On the one hand, writers wanted to wed the desires of

the self with the demands of the organism; this was the central goal of organicist thinking. But on the other hand, and in contrast to this tendency, social commentators routinely stressed the dangers of any absolute state power, so as to lay emphasis instead upon the necessary privileges of the isolated individual. Time and again, writers would work to show how refusals of the self might result in a more fully-realized citizens, so as to consolidate the claims of perfect self-sacrifice and personal happiness. But just as often, the work of writers like Comte and Mill had the effect of pointing precisely to the incommensurable nature of such claims, so as to render the boundaries between the self and the social all the more manifest.

Among organicist commentators, the most individualistic ideals would find expression in the work of Herbert Spencer. As the theorist most influential in popularizing organicist concepts in Britain, Spencer turned to modern physical and physiological principles as a guide for social cohesion. But while casting himself as a direct descendent of Comte, Spencer neatly inverted the standards of value set forth from his philosophical predecessor. "Every man has freedom to do all that he wills, provided that he infringes not the equal freedom of any other man," Spencer explained. In upholding the status of the isolated self, Spencer sanctioned the very values of laissez-faire that Comte had sought to critique and disconfirm, so as to show how principles of self-interest could create the conditions for social concord.[27] Spencer writes:

> The society exists for the benefit of its members; not its members for the benefit of society. It has ever to be remembered that great as may be the efforts made for the prosperity of the body politic, yet the claims of the body politic are nothing in themselves, and become something only in so far as they embody the claims of its component individuals.[28]

Just as Comte employed new notions in physics, physiology, and anatomy as a basis for

communal change, Spencer seized upon similar concepts to vastly different ends. "Component individuals" provide an absolute foundation for social value, so that the whole is just the sum of its parts. Whereas many Victorian social thinkers regarded the whole as superior to the sum of its parts, Spencer suggested that society was best understood as an accumulation of isolated subjects.

To be sure, intellectuals like Spencer took notable inspiration from new physiological and psychological studies, but no single scientific development more powerfully impacted the course of organicist thinking than Charles Darwin's evolutionism. As Darwin argued, the relations between organicisms were far from fixed; rather, they were defined by patterns of mutual modification and adjustment in response to the changing needs of existence. The final image in *Origin of Species* (1859) conveys a figure of endless growth along these lines. "These elaborately constructed forms so different from each other and dependent on each other in so complex a manner, have all been produced by laws acting around us."[29] Separation and interdependence are not opposed concepts, but of a piece with the growth of all animate life. Indeed, this emphasis upon evolutionary relations inspired more effusive statements about the development of the cosmos as a whole. In an influential article, the scientific popularizer Edward Dowden quoted a lecture from A.J. Ellis along these lines:

> Everywhere throughout the universe—thus runs the speculation of science—organic or inorganic, lifeless or living, vegetable or animal, intellectual or moral, on earth or in the unknown and glittering words we gaze at with awe and delight, there is a consensus of action, an agreement, a oneness.[30]

The Comtean concept of "consensus" appears, here, in support of the idea that the various phenomena of nature fit a single, integrated order. Just as animate organicisms are bound up with one another, the universe itself forms a perfectly harmonious whole; within this

vision of "oneness," there can exist no excesses, absences, or aporias, but only the continuing relations of order and progress. "[A] model of organic interdependence," writes Tess Coslett, "was implied by Darwin's theory of evolution" (21), and in lay scientific contexts this model was linked to a longstanding tradition of organicist theories. Given Darwin's repeated emphasis on patterns of progressive growth, however, it is easy to overlook his theory's reliance upon failures of fit--the unredeemed deaths of countless individuals that nature did not select. In fact, the symbol of the entangled bank, with its emphasis upon the fecundity of nature and its "elaborately constructed forms," was not the first image that Darwin had considered at the end of his study. Darwin's notebooks reveal his careful deliberation upon the image of coral reefs. Because living coral is alaways in a state of flux, it has less straightforward associations with order and progress, and points instead to patterns of erosion, constant re-growth, and arbitrary change. And in this sense, his theory turned attention to forms of contingency and chance within ordered law; his system required no external principles of superintendence, but only the automatic processes of nature's selecting will. Just as Charles Lyell's gradualist geology in the 1830s theorized the endless erosion of natural formations, Darwin emphasized the fact of continual losses of organic life itself. In his final choice of the entangled bank, Darwin captured a more reassuringly progressivist vision for his readers; but such strategic illustrations did not change the fact that his theory was predicated equally upon patterns of prodigality and waste within the natural order.

In fact, Darwin's theory stands as just one of an assortment of new scientific studies focusing upon such unrecuperated losses. In 1848, the British physicists James Joule and William Thompson announced an irreversible trend towards cosmic entropy,

the depletion of useful energy, while physiologists such as William Carpenter and Alexander Bain inquired into the essential sluggishness of the human sensorium. In the fields of biology, zoology, and comparative anatomy, intellectuals like Richard Chambers, A.R. Wallace, and Charles Darwin attempted to account for the endless extinctions and deaths demanded by the mechanisms of evolutionary change. All of these fields were working to theorize the inefficient economies of the organic. Not only were the regularities of nature dynamic and changing; they did so in an assortment of ways which were emphatically *non*-progressive. Or, rather, the logic of progress that they entailed also called for the losses and unproductive lapses of particular agents within the larger whole. John Tyndall's 1874 Belfast Address stands as the most culturally visible expression of these tendencies. As Tyndall exclaimed, quoting the seventeenth-century philosopher Joseph Butler, ""we may animate a succession of bodies, the dissolution of all of them having no more tendency to dissolve our real selves, or 'deprive us of living faculties—the faculties of perception and action—than the dissolution of any foreign matter which we are capable of receiving impressions from, or making use of for the common occasions of life.'"[31] The dissolution of the things around us does not mean that we, ourselves, are dissolute. Rather, the fact of unceasing erosion merely makes more mediated forms of relationship possible.

One of the central factors in the shift away from efficient economies of nature was the undermining of longstanding spiritual explanations. While earlier, eighteenth-century cosmologies had highlighted the superintendence of divine authority in nature, such assumptions became increasingly suspect in the middle years of Victoria's reign. Presuming the overall order, coherence, and clarity of the providential plan, natural

theologians sought to trace the parallels between the laws of nature and the moral order of human life. But with routine regularity, both theologians and popular novelists were led to set forth contradictory concepts of order and dispersion, progress and stasis, in ways which would ultimately weaken their efforts to reveal moral meanings in nature. In chapter one, I read these contradictions specifically in Charles Kingsley's social problem novel, *Alton Locke* (1850). As an Anglican minister of widespread repute, Kingsley appealed to established theodicies of nature—based upon the integrity, coherence, and essential moral meanings of nature—to arrive at a response to radical Chartist movements and the loss of faith among the working classes in the 1840s. At the same time, however, Kingsley's efforts to reconcile nature and society were offset by his very efforts to represent contemporary conflict—a tendency that led to irreconcilable contradictions at the heart of the novel.

Alton Locke marks the limits of natural theology in the representation of social life; in the end, Kingsley's eponymous hero is expelled from Britain altogether, left devoid of vocation, family, and marriage. But if Kingsley's work suggests the latent inadequacies of organicism, other writers were working to celebrate such limitations as an actual basis for fiction and its social mission. During these years, Kingsley's fellow Christian and social theorist Dickens cultivated such strategies as a basis for imagining British social reform in *Dombey and Son*. In fact, I argue in chapter two, the non-reproductive sexualities of *Dombey and Son*'s two marginal male bachelors appear at the very heart of the story's social commitments. To be sure, Dickens's bachelors, like Kingsley's Alton Locke, end without a marriage or personal legacy; but in contrast to *Alton Locke*, *Dombey and Son* suggests how such non-productive impulses might provide

a positive foundation for social relations, so as to reveal the salutary outcomes of personal failure and to disclose in the phenomenon of infertility the potential for unending social growth. Seen in this light, *Dombey and Son* presents a model of organic relations predicated precisely upon the failure of generation and inheritance as such.

Kingsley and Dickens mark two points of origin within the larger historical arc that I follow. While both were grounded in traditional Judeo-Christian ethics, Kingsley looks back to older assumptions about the efficient economy of nature, other writers like Dickens would embrace new notions of futility, loss, and self-defeat as the very basis for social improvement, and in ways which resonated with parallel developments in Victorian science itself. We can see this new emphasis even and especially in writers who were only passively involved with organicist theories, as in the case of Dickens's close friend and protégé Willkie Collins. Like Dickens, Collins celebrated the very failure of individuals to find self-completion in others. But whereas Dickens saw such failures in sexual terms, Collins located them in the workings of sensation. In chapter three, I explore the parallels between the scientific discovery of sensory delay, in the early 1850s, and Collins's interest in ideas about delay the pages of his sensation fiction. *Armadale*'s hesitating nervous hero, Ozias Midwinter, is cast consistently as a marginal and aberrant figure; but the point of the novel is to show how his hesitations are actually desirable and advantageous, allowing him to defeat the threats against him. While positioning Midwinter outside the traditional Victorian values of work, industry, and assertive action, such non-productive processes mark a reformed model of agency and influence. In contrast to the increasingly pathologized depiction of sensory delay in British medical contexts, then, Collins's novel conceived an alternative masculinity that enshrined the

enabling effects of irresolution and the failure of autonomous action in the public arena. The result was an alternative to the compulsions an increasingly frenetic, fast-paced British nation. By cultivating readers of sensation fiction—audiences experiencing such patterns of sensory delay in the experience of the text itself—Collins sought to offer a palliative for modern modes of order, efficiency, and rational self-control.

Both Dickens and Collins were working to align assumptions about non-productivity with the enterprise of the novel. Like Kingsley, these two writers sought to bring about a reformed social order; but in contrast to him, their political purposes were served precisely through figures of non-productivity. This is to say that the texts' antithetical relation to standards of social utility was upheld as a source of its identity. This was the case in both formal and thematic terms: just as the individual exceptions in Dickens and Collins were defined in contrast to the aims of sexual and economic productivity, those figures marked more mediated and roundabout systems of relationship within the form of the novel. Far from ending in more mutualistic, inclusive connections with the community, these characters remained in marginal relation to it. I argue that such loose ends became the very basis for a reformed social and aesthetic order.

The high realism of George Eliot's *Middlemarch* marks a zenith within the larger historical arc of this dissertation. In chapter four, I trace Eliot's efforts to envisage alternatives to contractual models of sympathetic exchange in her later fiction, particularly in light of her longstanding interests in thermodynamics. Developed and promulgated by many figures that Eliot knew and admired, the second law of thermodynamics, the law of entropy, suggested that the sum total of unproductive energy was always increasing in nature. Whether energy is expended for useful work or is

merely wasted, it never goes out of existence; rather, it continues to circulate in lesser, less calculable channels. This was the theory of diffusion, from which I take my title. As among the most culturally resonant theories of non-productivity at mid-century, models of diffusion offered an alternative to ideas of organic unity, and thus typified the kind of formal and conceptual concerns that I seek to trace throughout this dissertation. In Eliot's work, concepts of diffusion allowed her to re-think longstanding ideas about sympathy and contractual models of sympathetic exchange. Even and especially when sympathetic impulses fail to find direct expression in another, *Middlemarch* suggests in the figure of Dorothea Brooke, those impulses continue to circulate in less perceptible ways within the community at large. Far from a sign of her later pessimism, I argue, physics encouraged Eliot to arrive at a renewed moral and social philosophy.

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Chapter Two

"Complaints against Christianity:" The Narratives of Natural Theology in *Alton Locke*

As a philosophical enterprise linking scientific concepts and social critique, natural theology wielded powerful influence in early Victorian thought. Its ideals found favor not only among established scientific experts, but also among an assortment of lay commentators seeking to assign moral meanings to the phenomena of nature. To be sure, these thinkers took up a variety of political positions; the perceived truths of God's plan could serve many rival agendas, oftentimes within the parameters of a single text. But whatever their convictions, writers were linked by several interlocking ideas about the nature of God's creative contrivance. First and foremost, the physical universe fit together as a single, harmonious system of laws. As an expression of Providential fiat, nature could contain nothing impertinent, wasteful, without a purpose or plan. Second, these laws reflected the good intentions of God, and served specifically to inspire the progress of humankind. By revealing the moral values invested in nature, writers could claim to trace the hand of a beneficent Creator. As William Paley argued in *Natural Theology* (1805), for example, the length of the day exhibited God's desire to foster forms of industry and work, with a perfectly proportioned span of nightly rest. It was not that humanity developed in response to the world, but that the world was created for the continuation and development of humankind. Such linkages between physical

phenomena and social norms were held up as incontestable proof of God's plan. Thus conceived, the study of science was a deeply spiritual project, pointing the way to a more sacrosanct social order.

But tensions within natural theology appeared at every turn, often in reference to the very values that theorists most sought to uphold: namely, the intelligibility of God's plan, its moral meanings for human life, and the relative stability and permanence of natural forms. While virtually all writers were convinced of nature's orderly operations, for example, not all subscribed to the belief in its intransience. In light of biblical doctrine attesting to the finitude of the creation, some theorists in the 1830s and 1840s sought to account for the possibility of cosmic breakdown—a radical departure from older, eighteenth-century concepts from Paley, Joseph Butler, and others. As Victorian theologians like William Whewell would argue, the tendency towards unidirectional decline was imprinted within God's plan itself. These sorts of conceptual strains were compounded by the social contradictions in England itself at mid-century. Given the experience of widespread strife in the 1840s—in deepening disparities of class and gender, brought on by upheavals in labor and manufacture, technology, and trade—British readers became increasingly skeptical of any overmastering order of things. Simply put, the everyday experience of workers was at odds with the idea of a supreme legislative will. The loss of faith among the working classes became a pressing concern for religious thinkers during this time, many of whom were already wrestling with problems internal to their thought.

This chapter considers the shifting status of natural theology in the 1840s, focusing upon novelists' concerted efforts to re-establish religious faith among the

working classes. I turn specifically to Charles Kingsley's influential social protest novel, *Alton Locke, Tailor and Poet* (1850). While notoriously disjointed in structure, style, and theme, at the heart of Kingsley's story stood a single, controlling issue: the fact that ordinary workers could no longer see God's plan in the world around them. The effects of industrialism had rendered daily experience at odds with traditional religious pieties. Thus, the eponymous hero of Kingsley's novel explains, "Chartist workingmen […] complain that they cannot identify the God of the Bible with the God of the world around them; and one of their great complaints against Christianity is, that it demands assent to mysteries which are independent of, and even contradictory to, the laws of nature" (2.21). The perceived phenomena of nature, it seemed, were irreconcilable with religious "mysteries." In what ways could the chaotic world of the 1840s agree with older Christian orthodoxies? How could the fact of widespread upheaval, in other words, be seen in terms of the overall order, interconnection, and stability of God's plan? Just as theologians such as Whewell struggled to express the prospects of cosmic decline, novelists like Kingsley were working to comprehend similar sorts of concerns within the traditions of natural theology.

As an exercise in the *bildungsroman*, *Alton Locke* revolves around its hero's struggle to become a "poet of the people," working up from early poverty to find popular success. But as the story takes shape, Alton's progress as a poet means that he must remake himself spiritually. To become a successful poet, he must provide an explanation of God's plan in everyday experience. And in this manner, Alton's aesthetic education entails an education in natural science. The arc of the novel reflects this shift, and takes Alton through a series of teachers and mentors, including the Chartist sympathizers

Sandy Mackaye and John Crossthwaite, the country gentlemen the Dean of Winnstay (the so-called "Man of Science" (2.15)), his sister-in-law Eleanor Staunton, and an array of others. These characters mark Alton's progress from political materialism to the study of physical phenomena, leading up to his final injunction to "seek out [...] fresh physical and spiritual laws" (2.331). Out of the unmediated truths of nature, Alton promises to produce a new foundation for social change.

As a story of accomplishment based on his poetry, then, *Alton Locke* serves to restore the status of natural theology among audiences at mid-century. But at the same time, Kingsley's desire to expose the plight of the English poor led him in very different directions as the plot proceeds. At every turn, Alton's efforts to reveal God's plan have the effect of affirming the very materialism that he defines himself against. The signs of creative design, it turns out, are precisely what Alton cannot show in the world of the 1840s. Because the novel's providentialist views are at odds with its political exposé, Alton can never arrive at the higher principles that he seeks. In the end, the only agency available for him is his death; in Alton's untimely demise, the story closes off the possibility of finding "fresh spiritual and physical laws" (2. 331), so that the process of Alton's education ends in the discovery of its impossibility. Just as theologians and philosophers of science such as Whewell argued in same space of years, the study of natural perfection could resolve into the revelation of total decline.

Nevertheless, such forms of failure did not merely mark the horizons of scientific thinking. If *Alton Locke* suggests the limitations of natural theology in mid-Victorian contexts, then the story also points to potential substitutes. To be sure, Alton is left alone at the end of his life. Far from affirming the perfect order of God's plan, he remains

unrecuperated within the larger group. But such slippages between the part and the whole would come to occupy scientists and social theorists increasingly in the years to follow. In Alton's death, the novel points to the patterns of non-productivity that future writers would celebrate as a basis for organic relations. This is to say that, in his inability to find new "laws of nature," Alton indicates the shape of other "laws" and "discoveries in science" (2.307) within Britain during the 1850s and thereafter. As we shall see in the subsequent chapters, both scientists and non-scientists were led to valorize theories of non-productivity in order to represent the very possibilities for growth. Precisely by foregrounding figures of excess, prodigality, and waste, scientists and novelists would forge radical new notions of progressive change.

In my focus upon the shifting status of natural theology in *Alton Locke*, I join critics such as Catherine Gallagher, Alan Rauch, and others who have highlighted the novel's conceptual tensions at length. For Gallagher in particular, the novel upholds an ideal of "spiritual determinism" (identified with theologians such as Paley and Joseph Priestley) while tending time and again to display the fact of "material determination."[32] The breakdown of natural theology in *Alton Locke* is thus understood as an expression of larger historical pressures in the 1840s; time and again, the novel's ideals are offset by the fact of contemporary social strife. But while I agree with Gallagher's general emphasis upon the breakdown of religious ideologies in *Alton Locke*, my own reading differs in several ways. First, I situate these conceptual strains in light of the hero's own developing ideas about physical science. As a basis for Alton's education, the study of natural design is thematized as a foundation for both character (who Alton "is") and plot (what he "does"). Not just a thematic motif, terms and tropes of natural theology find focus in the

very identity of the novel and its development. Second, while acknowledging the impress of historical struggle in the novel, I seek to interpret the failure of Alton's ambitions in less symptomatic terms, in light of new scientific and social models appearing at mid-century. If in the end Alton cannot imagine new natural laws, then his failure suggests the future direction of science itself. In fields as diverse as biology, physiology, psychology, and physics, scientists would turn to the asymmetries between part and whole, emphasizing the unrecuperated losses within the natural order as a new basis for organic relationship.

Kingsley's acquaintance with natural theology spanned the course of his career as a novelist, naturalist, and Anglican minister. As an undergraduate at Trinity College, Cambridge in the early 1840s (where Whewell served as Master), he studied the writings of Paley and Joseph Priestly with scrupulous care, in keeping with his ambition of entering the established Church.[33] These writers all agreed that the cosmos consisted of a closed, coherent, and supremely stable system of meanings. His private letters recommend the works of Whewell and Thomas Chalmers with similar enthusiasm, as recorded in his exchanges with Thomas Cooper (the archetype for Alton Locke) in the early 1850s.[34] Kingsley's longstanding fascination with natural theology found expression in his popular lectures and essays, as well, in which he exhorted his audiences to the study of God's plan in the world. He explained to an audience of workingmen in 1871:

> Let me urge you to study Natural Science on grounds which may be to you new and unexpected--on social, I had almost said on political, grounds. […] I tell you that in becoming scientific men, in studying science and acquiring the scientific habits of mind, you will find yourselves enjoying a freedom, equality, a brotherhood such as you will not find elsewhere just now.[35]

The study of the natural world promises to provide a foundation for social improvement.

Through sufficient study and application in "scientific habits of mind," Kingsley believed that ordinary workers would achieve the demands for freedom, equality, and brotherhood set forth by radical Chartists. These habits would encourage forms of fellowship which were freed from class prejudice, and which inhered instead in standards of objectivity and impartial analysis. New institutions would arise from informal modes of natural study, so that science could create the conditions for a renewed society.

At the same time, Kingsley knew just enough to know that science did not always fit the assumptions of religious doctrine, and so he acknowledged the limitations of natural theology as an absolute standard of interpretation. By the later 1840s, he had come to condemn the continuing circulation of older, Paleyan perspectives and to search for more satisfactory alternatives to them, even as he continued to celebrate natural theology's basis in transcendent truth. Although he began his career by inveighing against the deterministic models of Richard Chambers's *Vestiges of Creation* (1844) and the advocates of what he saw as a narrow positivism, his encounters with evolutionary theorists such as A.R. Wallace and Charles Darwin led him to alter and revise his defense of natural design. The narratives of natural theology, Kingsley clearly recognized, were conditional and in need of corrective changes as science itself advanced.

In what follows, I trace the shared constellation of ideas between novelists such as Kingsley and natural theologians as they sought to come to terms with new notions of disorder and decline at mid-century. I focus upon a one particular point of connection between these writers: the status of the individual deviation or exception. On the one hand, many traditional theologians wanted to incorporate the exception back into the order of nature; but on the other hand, some religious thinkers were willing to

acknowledge that the part did not always fit into the operations of the whole, and that, accordingly, nature exhibited patterns of prodigality and waste over time. Although this problem itself remained unresolved in the work of theorists such as Whewell, John Herschel, and others, I argue that it would find powerful articulation within the world of *Alton Locke*. In the fate of its isolated hero, as we shall see, Kingsley's novel voiced a set of larger concerns about deviation and decay found in much Victorian philosophical thought.

I. Order, Deviation, and Change in British Natural Theology

Despite increasing conflicts between the clergy and intellectual elites in the latter half of Victoria's reign, over the first part of the century science and religion continued to provide a single, clear, and astonishingly coherent account of nature. The complexities and contradictions between thinkers in this tradition—whose leaders included Oxbridge dons such as William Whewell, John Herschel, and Richard Owen, engineers such as Charles Babbage, and Anglican divines like Thomas Chalmers—are crucial. But what linked them together was an unshakable conviction that every law of nature was evidence of the benign will of God, the sign of a system uniquely suited for the perpetuation and improvement of human life. To this extent, the writers could conceive of their task as a unified and relatively consistent project, intended to interpret the theories of modern science in terms of Christian faith. Drawing upon the formative models set out by William Paley, Bishop Berkeley, and others in the latter years of the eighteenth century, a range of thinkers in the 1820s and 1830s thus laid the basis for a flourishing theodicy of nature.

Marked by its lucidity and apparent artlessness, the overarching argument of British natural theology can be summarized by a few shared assumptions, each based in the logic of common sense and intuitive knowledge: the world is organized upon a limited number of natural laws which we can come to know; these laws are perfectly adapted to the conditions of life, and thus point back to an original Creator who shaped them; the laws correspond with one another in a perfectly interlocking order, so that the whole of nature manifests the beauty, rationality, and simplicity of every part. In hindsight, it is clear that individual thinkers set out different interpretations of these three themes, often within a single text. Indeed, a simultaneous strength and fundamental flaw within natural theology was its ability to charge a common idiom with a range of meanings, so that its terms resonated in fluid and far-reaching directions. Yet the assumptions themselves—the intelligibility of physical laws, their calculated correspondence with human life, and their arrangement within an efficient economy of nature--would resurface in a variety of contexts over the ensuing decades, attesting both to their broad social impact and a deeply-felt desire for consensus about them.[36]

Particularly powerful for readers—in Paley's post-revolutionary milieu no less than in Whewell's and Herschel's in the aftermath of the First Reform Bill of 1832—was the notion of an unchanging and self-balancing economy of nature. Again, the various versions of this cosmology are a testament to its attraction. "Order," for example, could connote an unchanging uniformity of events, as Charles Lyell argued, or the equilibrating effect of apparent catastrophes and cataclysms over time, as William Whewell claimed. But in any account, the system of nature was seamless and self-consistent, a reflection of its Creator, so that it remained stable and impervious to change.

Yet, precisely because of this investment in an efficient universe, it was increasingly important for natural theologians to explain the appearance of decay and large-scale waste in the world—an almost unavoidable inference given recent outbreaks of cholera, widespread unemployment, and famine in England and Ireland. As we shall see, the precarious conditions of society were a crucial impetus for establishing the economy of nature. How could enormous waste coincide with the principle of order? The urgency of the task was compounded by the fact that many natural theologians rejected the Malthusian rationale for population checks, previously defended in Paley's *Natural Theology*. While continuing to recognize Paley as a principal forebear—his works were still required reading at Cambridge through the mid-1840s—the utilitarian solution seemed unsatisfactory to many natural theologians from the 1830s onwards. Simply put, prolonged experiences of pestilence, starvation, and other impediments to life could no longer be explained by a neat machinery of checks and balances. Moreover, new scientific theories themselves seemed to disprove the permanence of the Earth itself. The continuing popularity of the nebular hypothesis in particular, alongside recent theories of the planetary core, suggested that our world was cooling and would become inhospitable to humankind.[37] As Lord Kelvin announced to the British Association in 1851, drawing upon a different set of data, the world was slowly dying.

Although not quite paralleling the sheer millenarian panic of earlier memory, British authors saw steadily accumulating evidences for a downward-directed universe, forcing natural theology to explain itself increasingly in terms of what it was *not*: the anomalous, wayward, and the protuberant phenomena that seemed to stand out from unity of nature. The individual exceptions and omissions from order were amassing, it

seemed, and threatening to dislodge the very standard norm that natural theologians began by assuming. The ingenuity with which natural theologians took up this challenge indicates both the persistence of their paradigms and to the pressing need to maintain them in light of a changing social and intellectual milieu.

Focusing on several formative treatises in nineteenth-century natural theology, this section considers the efforts of Whewell, Herschel, and Lyell to harmonize the rational plan of nature alongside indications of irreversible and seemingly senseless loss. What seems most immediately clear is that no single, settled explanation emerged for the concerns they expressed (consciously or otherwise). The arguments for order could be as varied as the writers themselves—a reminder of the heterogeneity of ideas in a period where the distinction between specialist inquiry and general knowledge was still at issue. Yet, one does notice a general effort to account for the role of the deviation in the context of the standard norm. In Whewell's Bridgewater treatise in particular, these efforts lead to a curious kind of double valence about the anomaly or "derangement" itself. Specifically, as we shall see, these "derangements" slide from a state of opposition to the norm on the one hand, to an embodiment of the unity and "homogeneity" of nature, on the other hand. In this way, writers like Whewell and Herschel strove to resolve their concerns through a new conception of the individual aberration or deviation in a universe where contingency and chance were strictly disallowed, and where each detail could be held up, at least nominally, as a sign of the whole.

While the themes of nineteenth-century natural theology were expressed in influential works such as William Buckland's mineralogy studies of the early 1820's and John Herschel's *Preliminary Discourse* (1831), which fared well among an informed

readership, they found unprecedented popularity in Whewell's *Astronomy and General Physics* (1833). The text was commissioned as the inaugural treatise for the Bridgewater series, whose central task was to elaborate upon Paley's providentialist views of natural law. Whewell's purpose was to introduce the main argument of the texts to follow—namely, "the order, benevolence, and good of nature as manifested by God."[38] In doing so, his work became both a phenomenally successful compendium of arguments and a key resource for subsequent writers--admired even by those who disagreed with his individual claims (including luminaries such as Lyell and Herschel himself).[39]

In Whewell's hands, the purpose prescribed for his work—to summarize rather than argue, to merely concentrate and condense what is apparent elsewhere—becomes a subtle rhetorical strategy. "My prescribed object," he writes in the opening chapter, "is to lead the friends of religion to look with confidence and pleasure on the progress of the physical sciences, by showing how admirably every advance in our knowledge of the universe harmonizes with the belief of a most wise and good God" (1). The informality of his prose (imagined as a pleasurable occupation for "friends") is carefully calculated, and works to project a kind of unflappable confidence in his claims. Whewell's point is not so much to persuade as to expand upon an accepted argument with new evidence. Eschewing all traces of speculation or philosophical debate, he seeks only to endorse what is intuitively obvious, and appeals in particular to "the belief of a most wise and good God." The prospect of difference or disagreement never enters seriously into Whewell's world, precisely because his community of readers is already convinced.

As creation implies a Creator, so do the laws of nature ensure the existence of a legislative authority behind them, shaping and superintending them for human life. It is

this logic of inference and implication that drives Whewell's argument forward, so that causality is assumed (rather than shown explicitly) by the steady accumulation of terms, the forward progression of the prose itself. He writes:

> Our knowledge of nature is our knowledge of laws [...] of operation and connection, succession and coexistence among the various elements and appearances around us. [...] [T]his view of the universe falls in with our conception of the divine author, by whom we hold the universe to be made and governed [...]. (15)

The mere "operation" of laws shades into a sense of inevitable "connection" between them; "succession" slides into "coexistence." The fact of sequence and the necessary linkage of cause and effect is thus enriched with meaning, and reflects back upon a First Cause that unifies all action. While clearly conscious of the limits of language and its capacity for wayward meaning, there is thus an effort to make denotation consistent with disputation, so that the mere description of nature is conferred a kind of argumentative weight. Simply by observing the basic rules of the world, one is led ineluctably toward the truth of God. Each chapter on the laws of gravity, the length of the day, and the origins of the solar system reiterates the same tireless thesis over and over again. By virtue of the fact that that every detail in nature is evidence of the same Creative plan, the text cannot help but reflect the stability and sameness that it perceives.

As it advances, Whewell's work thus projects the potential for limitless restatement. The plenitude and order of the world is translated into the plenitude and order of Whewell's text; new examples—what he calls "supplies from this vast and inexhaustible source of original truths"--will never deviate from this essential ideal. Accordingly, interpretation threatens to break down only in the very wealth of possible examples--never by any multiplicity of meanings per se. He writes:

> the adaptations and aims which exist in the laws of nature […] the tendency of this part of the legislation of the universe and on the character and disposition of the legislator [...] if we attempt to comprehend at once the whole of this complex system, we find our selves utterly baffled and overwhelmed by its extent and multiplicity (21).

An inherently imperfect medium, writing—and the writer himself--cannot capture the order and plenitude that defines creation. The book of nature is in this way only approximated and can never be transposed perfectly in the canons of natural theology: "[o]ur purpose is not to show that natural theology is a perfect and satisfactory scheme," he explains, "but to bring up our natural theology to the point of view in which it may be contemplated by the aid of our natural philosophy" (14). An ambition towards panglossia is thus accompanied by claims of inadequacy relating to the writer's own expressive and perceptual shortcomings. The rationale is a surprisingly consistent one in Whewell's text. As he writes at a later juncture, "A great number of quantities and laws appear to have been selected in the construction of the universe […]. While we are enumerating these correspondences we perceive that there are thousands of others, and that we can only select a very small number of those where the relation happens to be most clearly made out or most easily explained" (115). It remains a powerful and curiously circular strategy of confirmation: the rationality and coherence of the argument is guaranteed by the world it claims to reflect, but, at the same time, inaccuracies and omissions are explained by the merely provisional nature of the analogy, which exonerates the author from error.

Because every action leads back to a First Cause, the presiding authority who set it in motion, contingency and chance are strictly disallowed; nothing exists outside of the providential plan. As Whewell writes, "the variety of the effects takes place, because the circumstances in different cases vary; and not because the action of material causes

leaves anything to chance in the result" (15). Although objects and organisms behave differently under different conditions, this merely manifests the suppleness of design: "variety" refers back to a basic uniformity of cause. Indeed, Herbert Spencer would enlist this ideal in the service of a vastly different argument, where it becomes the principle of heterogeneity in increasing homogeneity. Commenting on the uniform structure of atoms, Whewell writes:

> How unlike chance everything looks [...] that the laws are tempered and fitted together in the only way in which the world could have gone on, according to all that we can conceive of it. This must therefore be the work of choice; and if so, it cannot be doubted, of a most wise and benevolent chooser. (116)

Whewell sees that nature is just so "tempered and fitted together" as to result in its continuing vitality, so that it could not continue to exist in any other way. Thus the length of the year is perfectly adapted to the existence of plant life, as the length of the day is patterned after the human periods of sleep and sentience. Any other arrangement would be antagonistic to life: "if therefore the duration of the seasons were much to change, the processes of vegetable life would be interrupted, deranged, distempered. [...] We should have not only a year of confusion, but, if it were repeated and continued, a year of death" (33). It is not that there exists some single, all-pervasive law that pulls all of nature together, but rather a perfect harmony between different laws. The profusion of details goes hand in hand with this principle of unity and interconnection, so that each additional part adds to the integration of the whole. Simply put, there are no serendipitous events in nature.

Everything in nature thus resonates with the "first cause," even though His plan itself—the "final causes" in nature--are beyond our grasp. The distinction is an important

one: while evidences for a Creator are constantly presented to us, we cannot assume the ultimate shape of the design. All that seems arbitrary and capricious is simply unexplained as yet—signs of order in which we are not proficient. Herschel and Whewell presented similar versions of this distinction, as we shall see shortly, although in Whewell's hands it takes special importance in his argument for stability.

While celebrating the unity of nature, Whewell remains well aware of apparent incongruities, the freaks and disturbances that seem to dishevel it. Aberrant events—disasters such as earthquakes and volcanic eruptions—can take place unexpectedly, so that vast pockets of life are faced with inclement conditions and seemingly irrational death. How could a beneficent Creator allow such wanton devastation? The effort to integrate these conditions within the natural order was a crucial concern for natural theologians, suggesting a desire for comprehension in the face of increasing intellectual frictions. Whewell's own solution was to posit a principle of mono-directional development in nature, so that the cataclysms of the past were slowly petering out and giving way to growing stability and balance. To be sure, the potential for violence and massive misery is still in evidence; but these signs were steadily diminishing in light of a more resplendent (though ultimately unknowable) future. In this way, the progressive thrust of history was of a piece with the leaps and lacunae of the present; as it turned out, these eruptive events were part of the same ultimate design still working itself out in nature.

While widely influential among contemporaries, Whewell's account of stability—and those of the Bridgewater authors in general—was far from unchallenged. As an 1833 article in *Fraser's* complained, "the writers, one and all, so far as they go are

demonstrating a happy life in the regions of death, for what is all nature but a body of death—a great body of corruption tending however to a new generation."[40] The observation is less cynical than it sounds: in arguing for the progressive movement of history, writers like Whewell had simply understated the periodic processes of decay that carry on in nature, the singular fact that massive death--"a great body of corruption"--is necessary to ensure the continuation of life. As we shall see, Whewell was in fact extraordinarily attuned to the problems of disorder and natural decay, even though he circumscribed his deepest speculations carefully.

The ideal of periodic change originated in the theories of the Cambridge geologist Charles Lyell. Lyell argued famously in *The Principles of Geology* (1830-1831) that the Earth is not moving towards some ultimate end, but merely manifests a steady, uniform balance between causes and effects, so that the state of the Earth has remained substantively unchanged over time. For Lyell, valid scientific data must be based upon the empirical evidences of the present, rather than speculative guesses about the past; and since the Earth is now relatively stable, we must assume that it has always been so. This is not to say that Lyell denies that catastrophes take place. But the important point is that he puts them in the service of a synchronic, cyclical view of history, so that they always act to restore the mean balance of nature. Thus, volcanic eruptions form a perfect counterpart to the effects of de-sedimentation and soil erosion, and preserve the relationship between land masses and the sea level over time.

For Lyell, what looks like decay is revealed from a wider perspective as part of a mathematically precise set of checks and balances. He explains, "although these agents…of decay and reproduction, are local in reference to periods of short duration,

such as those which history in general embraces, they are nevertheless universal if we extend our views to a sufficient lapse of ages" (257). Lyell's ideal also extends into sentient life, in the intermittent nature of population checks: "so often the source of death and terror to the inhabitants of the globe," he writes, "is nevertheless a conservative principle in the highest degree, and above all others, essential to the stability of the system" (479). Nature is thus a "theater of decay," as Lyell puts it, in which the drama of natural ruin is performed in perpetuity; it is not that massive losses do not take place, but that they are closely bound up in an unchanging compensatory scheme.

Whereas Whewell remained uneasy with his counterpart's utilitarian premises—particularly the notion of a statistical scale of adjustments and compensations—Lyell is in turn led to deny Whewell's proof of temporal change. For Lyell, hypotheses must be supported by direct, firsthand observations. We simply have no evidence to support the idea that catastrophes were more intense in the past than they are now. But what links the two thinkers together is a shared rationale respecting the unity of nature, according to which isolated anomalies always turn out to be signs of the standard norm. That which appears prodigal and uncouth, once rightly regarded, can be brought back into the ordinary, productive operations of nature. Thus Whewell writes, in a passage that picks up Lyell's own phraseology:

> When we have illustrated the correspondences which exist in every province of nature, between the qualities of brute matter and the constitution of living things, between the tendency to derangement and the conservative influences by which such a tendency is counteracted, between the office of the minutest speck and of the most general laws; it will, we trust, be difficult or impossible to exclude from our conception of this wonderful system, the idea of a harmonizing, a preserving, a contriving, and intending mind…far exceeding the limits of our thoughts. (22)

The celebration of natural laws is of a piece with the general unity of creation itself, the perfect coordination between systems and microsystems: “the minutest speck” still obeys “the most general laws.” Similarly, “derangement” and “conservative influences” co-exist and conspire towards perfect order. As Lyell also argues, these exceptions are only outwardly different; within the larger pattern of things, they conspire within an all-inclusive economy of nature.

Whewell’s nominal reconciliation between "derangement" and "stability" thus appears as part of a larger effort to pull apparent anomalies back towards a behavioral norm. In the same way that causation is evidence of a First Cause, “derangement” thus contains the kernel of an original “arranger,” so that Whewell’s diction evokes the very idea that it seeks to express. The picture is of a perfect confluence of oppositional entities, an appeal to stability based upon the Newtonian paradigm. For every action (or cause) there is an equal and opposite reaction (or effect), which in turn inaugurates the cycle anew. At the same time, the deep structure of the Newtonian world-view requires qualification: is it “difficult” or “impossible” to resist the notion of a preserving genius? The uncertainty is exacerbated by the negative structure of the proposition itself, which stresses that which we cannot exclude, rather than what we must embrace.

The moment of hesitation, however minor it appears in the passage itself, marks a larger point of tension in Whewell’s argument. On the one hand, he argues that the world is moving inexorably along a directional path; on the other hand, he denies that we can acquire any real knowledge about that direction: “final causes” are not available to us, since we cannot claim knowledge about the ultimate shape of God’s plan. Whewell is

thus led to entertain the possibility that progress may *not* be conducive to existence, and that design may culminate in the ultimate apotheosis of life.

In proceeding along these lines, Whewell drew upon the arguments of his acquaintance John Herschel, who had considered the prospect of universal decline just two years earlier, in 1831, in his *Preliminary Discourse on Natural Philosophy*. "Geometers have demonstrated that in the midst of all the fluctuations," he writes, "the general balance of the parts of the system will always be preserved, and every departure from the mean state periodically compensated. But neither the researches of the physical astronomer, nor those of the geologist, give us any ground for regarding our system, or the globe we inhabit, as of eternal duration."[41] As Herschel points out, the stability of nature is distinct from its permanence, so that while the "general balance" remains more or less unchanged over time, the world may undergo increasing degrees of inefficiency. These "departures from the mean" may result in the end of everything. However, since we are unable to speculate upon final causes, individual "departures" are beyond Herschel's purposes, and are rendered morally meaningless. With the same gesture, Herschel acknowledges the importance of these deviations and brackets them from any specific signification.

This strategy takes shape in Whewell's argument in a chapter devoted to the laws of friction, where cosmic disintegration and decay reappear as important themes. In this chapter, Whewell draws upon recent observations of the Menke comet in 1822 and 1825, which showed that stellar objects were subject to small but measurable eccentricities in their orbits. Multiplied exponentially over time, the cumulative effect would be to knock the planets out of alignment:

> The planets are very small compared with the sun [...] but this gives us no security that the derangement may not become very large in the course of many revolutions [...]. Is it not easily conceivable then that in the lapse of ages the derangement of the motions of the planets may accumulate, the orbits may change their form, their mutual distances may be much increased, or diminished? Is it not possible that these changes may go on without limit and end in the complete subversion and ruin of the system? (155)

Rather than a progressive integration of parts, small inefficiencies may accumulate over the *long durée* and unsettle the very order upon which life depends. What concerns Whewell is not so much the appearance of spectacular disturbances in the natural design, which he has already explained at length. Rather, he emphasizes the insidious increment—precisely those tiny "derangements" that tend to elude observation. Explicitly denying Lyell's assumptions about a steady state of nature, he writes, "as all the geological states of which we find evidence in the present state of the Earth have had their termination, so also the astronomical conditions under which the revolutions of the Earth itself proceed, involve the necessity of a future cessation of these revolutions" (157). Instead of giving way to progressive order, unbalancing effects may accrue over time. Emphasizing this directional view of nature, Whewell follows its implications to their conclusion:

> Since there is such a retarding force perpetually acting, however slight it be, it must in the end destroy all the celestial motions. It may be millions of millions of years before he earth's retardations may perceptibly affect the apparent motion of the sun; but still the day will come (if the same providence which formed the system should permit it to continue so long) when this cause will entirely change the length of our year [...] and finally stop the earth's motion round the sun altogether.

Given enough time, the effects of atmospheric drag (or "retarding force") will warp the unity of nature, so that the length of the year—which Whewell had shown to be so well

adapted to human life—will eventually fall out of step with the pace of survival. Both the "retarding force" and "the length of the year" are brought into being by God; but over a long interval the two principles will conspire against us, so that the disintegration of life is woven into the orderly fabric of nature. Far from guaranteeing human life, the permanency of laws may lead toward its ultimate destruction; while laws are stable, life is subject to disorder.

Building upon Herschel's distinction between stability and permanence, Whewell gives "derangements" themselves the status of law. God has willed that these derangements remain minuscule, he proceeds to argue, so that they preserve the "mean condition" of order over time. Nevertheless, the meaning of "order" and "derangement" have shifted radically. In one of the text's most challenging moments, which should be quoted at length, Whewell writes:

> We are in the habit sometimes of contrasting the transient destiny of man with the permanence of the forests, the mountains, the ocean—with the unwearied circuit of the sun. But this contrast is a delusion of our own imagination; the difference is after all but one of degree [...]. And it now appears that the courses of the heavens themselves are not exempt from the universal law of decay; that not only the rocks and the mountains, but the sun and the moon have the sentence "to end" stamped upon their foreheads. They enjoy no privilege beyond man except a longer respite. The ephemeron perishes in an hour; man endures for his three score years and ten; an empire, a nation, numbers its centuries, it may be its thousands of years; the continents and islands which its dominion includes have perhaps their date, as those which preceded them have had; and the very revolutions of the sky by which centuries are numbered will at last languish and stand still. (158)

This "universal law of decay" is distinguished from the "law of creation" by sheer degree, so that their antithesis is simply "a delusion of our own imagination." At the same time, Whewell curtails the potential for deep pessimism: far from relativizing human life,

and reducing it to a general principle of waste, the "law of decay" actually affirms the anthropomorphic aspect of natural theology. Through this law, humankind becomes even more central to the interpretation of nature: the very "foreheads" of the elements affirm the teleology of our life span. Similarly, "the forests, mountains, the ocean" are best understood in terms of our own "transient destiny," not in contrast to it. "Man," "empire," and "continents" are linked as equivalent systems of varying scale, but the root metaphor for "continents" remains "man." Even in describing the death of nature, Whewell thus affirms the pre-eminence of humankind in it; the law of decay is merely a reflection of the same intuitively obvious laws of human life: nature "enjoy[s] no privilege beyond man except a longer respite."

Whewell is walking a fine line: he argues for the centrality of humankind in the natural order in order to explain what appears antithetical to it. Openly acknowledging this tension, he writes:

> It may perhaps appear to some that this acknowledgment of the system to derangement through the action of a resisting medium is inconsistent with the argument which we have drawn in a previous chapter, from the provisions for its stability. In reality, however, the two views are in perfect agreement, so far as our purpose is concerned. The main point which we had to urge, in the consideration of the stability of the system, was not that it is constructed to last for ever, but that while it lasts, the deviations from its mean condition are very small. It is this property which fits the world for its uses.

Again, the unspoken antagonist is Lyell's uniformitarianism. Rather than a timeless stasis (as Lyell would have it), stability is situated in time--an expression of slow, unobtrusive, yet irreversible change. As Whewell points out, order does not rule out the possibility of downward change. Since we cannot know final causes, Whewell goes on to suggest, we cannot understand why deviations from the norm are allowed to exist—only that they do

and are providentially inspired. “To dwell on the moral and religious reflections suggested by this train of thought,” he explains, “is not to our present purpose; but we may observe that it introduces a *homogeneity*, so to speak, into the government of the universe.” Instances of apparent waste and inefficiency merely point out the stability of the whole—the “standard mean”--without having any expressive weight of their own.

In this way, Whewell seeks to close off the ethical implications of these deviations. Yet the final argument for “homogeneity” suggests that they do in fact have moral significance—that is, they are meaningful insofar as they embody a universal *norm*. Strikingly, aberrant phenomena—all that is irregular and exempt from analogy--have become the very basis for a common standard in nature. As it turns out, what links the universe together are these minuscule tendencies toward decline.

By and large, Whewell’s text offers a remarkably complex and sophisticated account of natural laws through a religious framework. In drawing attention to the specific issue of “derangements” in his cosmology, I seek to point out its equivocation about the status of individual deviations. Such aberrations are at once a counterpart to order and an embodiment of it, simultaneously outside “the mean” and its greatest, most “universal” expression. And while central to the fate of nature, these deviations are destined to remain always outside the purview of analysis. In Whewell’s words, the sentence “to end” means that there is a specific conclusion inscribed in nature; however, we are humanly incapable of reading that ending. As we shall see in *Alton Locke*, Alton’s curiously unsettled status—conceived alternately as an aberration from the norm and as an embodiment of it--reflects upon these aspects of Whewell’s narrative. How Kingsley

works to resolve them—and their connection with the problem of social decay in the novel—are my subsequent concern.

II. "The Will of the World" in *Alton Locke*

"The most minute natural phenomenon," Charles Kingsley explained, "must be divine; I say, deliberately divine."[42] Like the natural theologians who he knew and studied over the course of his career, Kingsley believed that the world everywhere reflected the workings of God's creative contrivance. Properly perceived, every element in nature signified the overall order of the cosmic whole. One need not be a trained expert in order to grasp God's laws, Kingsley believed; through forms of sustained study and self-cultivation alone, any amateur naturalist could come to grasp the moral and spiritual meanings of nature. Kingsley promulgated these ideas in an array of popular texts, including *Glaucus, or the Wonders of the Shore* (1855) and *Town Geology* (1872), all of which sought to encourage the arts of natural science as a popular pursuit.

These beliefs provided powerful inspiration for *Alton Locke,* albeit in highly particularized ways. As an aspiring artist, Alton desires nothing more than to become a "poet of the people." But with remarkable regularly, Kingsley's novel invokes the conventions of the *bildungsroman* for a higher purpose, so that the poet's progress becomes an occasion for representing moral and spiritual transformation. Alton's ambition to become a popular voice means that he must remake himself spiritually, apart from radical politics. As the plot proceeds, the story turns upon Alton's attempt to reform society through the revelation of "God's laws" (2.302) in nature. This means that Alton must renounce physical force Chartism and find moral meaning in the primary processes of the physical world. By arriving at the unmediated truths of providence, as a budding

naturalist, it becomes possible for him to build up a new basis for social renewal. In the end, Alton departs both from the materialistic models of both physical force Chartists and their conservative counterparts; instead, he attempts to shore up society through nothing less than the laws of physical phenomena.

Thus conceived, *Alton Locke* turns upon the poet's struggle to reveal religious truth: those forms of order, interconnection, and coherence set forth by Paley and his later eighteenth-century counterparts. But the novel subjects these doctrines to the specific pressures of English life in the 1840s. How could subjugated workers like Alton find the time and resources to acquaint themselves with the workings of the natural order, especially when nature seemed everywhere to express patterns of arbitrary suffering, sickness, and confusion? Just as Victorian theologians sought to account for forms of widespread disaggregation and decay within God's plan, Kingsley set out to argue how natural theology might remain relevant to lay readers in light of the apparent reign of the random, the arbitrary, and the capricious in the 1840s. Everywhere in the contemporary world, the perceived phenomena of nature appear to call into question the belief in a higher ordering principle, indicating difference and disorder, confusion rather than stability and stasis. We see these phenomena in several ways in the novel: in its representation of urban squalor and the devastation of the countryside; of rampant death and disease, of the massive emisseration of the urban poor and their conditions of living, leading up to the ill-fated Chartist demonstrations of April 10th, 1848. The central task for Kingsley's hero, then, is to re-claim the relevance of natural theology for workers who could no longer see God in the midst of their world. How could the fact of universal decay, to paraphrase Whewell, become a means of proving God's plan?

As Alton learns to fashion himself as a poet and naturalist, he strives to interpret those signs of disorder as indications of providential fiat. But as the action advances, the problem of the poet's education itself will also shift, so that the novel turns upon a more basic dilemma: the possibility that the perceived laws of nature do not point back to God's plan, after all. Time and again, the search for higher meaning is offset by the repeated fact of material determinacy, leaving little room for any transcendent truth beyond the secular world.[43] As it turns out, the condition of England in the 1840s might not actually affirm the laws of order and rational design that *Alton Locke* starts out by presupposing. Faced with this possibility, the novel cannot do anything other than to destroy the hero that seeks out those laws themselves. Far from providing a means to popular success and political change, Alton's search for "new physical and spiritual laws" is precisely his undoing, so that his greatest work will be the story of his very failure. Whatever abstract value the novel invests in the laws of organic order, what *Alton Locke* turns out to show is their absence. *Alton Locke*'s narrative of natural theology is, in this sense, a narrative of its impossibility in England during the 1840s.

The relationship between personal suffering and "God's purpose" appears as a central concern at the outset of the novel. Alton writes:

> And so I have learnt--if, indeed, I have learnt--to be a poet—a poet of the people. That honor, surely, was worth buying with asthma, and rickets, and consumption, and weakness, and--worst of all to me—with ugliness. It was God's purpose about me; and, therefore, all circumstances combined to imprison me in London. (I.132)

Instead of focusing upon the most visible signs of "God's purpose," the novel will attend to the poet's experience of "reeking garrets and workrooms" and the "prison-house of brick and iron." Because every part of nature reflects necessarily the interconnection of the whole, such settings must also appear within the providential plan. In fact, that

experience will be revealed as the very basis of God's plan for Alton—the foundation for his knowledge and "learn[ing]" of contemporary life. Alton rejects the notion that it was "my curse, Fate's injustice to me, which kept me from developing my genius." "[I]njustice" is not a sign of God's absence; much to the contrary, it should be seen as testimony to His active role in Alton's life.

In *Alton Locke*, then, learning to be a "poet of the people" means learning to find higher value in the very facts of death, disorder, and decay. The experience of widespread suffering is precisely what will allow Alton to create the great work of poetry that he has planned. Nevertheless, while he wishes to express "God's purpose" for Britain in the 1840s, his efforts are undercut by patterns of compromise and concession at every turn. In the passage above, for example, Alton's pretensions to knowledge (what "I have learnt") are weakened by qualification ("if, indeed, I have learnt"), so as to simultaneously define and also destabilize his position of poetic authority. Rather than testifying to God's plan, there may be no greater lesson to be learned from lived experience. Such tensions between "God's purpose" and its apparent absence will come to organize the story of Alton's education as a whole, so as to become a central focus for the plot.

This tension between learning and its lack becomes clearer in Alton's account of his Calvinist upbringing. Raised in relative isolation with his sister in the London suburbs, his mother's assumptions about "God's will" reign supreme. He writes:

> I used, as I said, to call it the curse of circumstance that I was a sickly, decrepit Cockney. My mother used to tell me that it was the cross which God had given me to bear. I know now that she was right there. She used to say that my disease was God's will. I do not think, though, that she spoke right there also. I think that it was the will of the world and of the devil, of man's avarice and laziness and ignorance. (132)

Far from the "curse of circumstance," it is "God's will" to make him unwell. Alton's hardships should be seen as signs of creative superintendence, "the cross" that He has given the poet. But the passage then turns upon itself by interpreting Alton's "disease" as a sign of His absence. As it turns out, what ails Alton is the "will of the world and [...] the devil."[44] And, finally, the blame falls upon man's actions towards man: "avarice and laziness and ignorance." The three accounts remain unreconciled within the larger logic of the passage. Faced with different ways of interpreting social ills, the narrator puts them in paratactic relationship without resolving them into any clear correspondence. The fact of emisseration is a gift of God and the impress of the devil, the product of higher powers and of human failings alone. What is "God's will" can, upon close consideration, be made subject to several different, even incommensurate views.

In this manner, the text gestures beyond the religious framework that it begins by affirming. The invocation of "God's will" is bound up, here as elsewhere, with significant skepticism, doubt, and irony. But these implications remain latent in the opening chapters. For almost as soon as the secular explanation is set forth, it is contained within a more local critique of his mother's Calvinism. In fact, it is not "God's will" which is absent from 1840s Britain, but only an abstraction of it. He writes:

> My mother moved by rule and method; by God's law, as she considered, and that only. [...] She had as yet no right to have any "spiritual affection" for us. We were still "children of wrath and of the devil,"--not yet "convinced of sin," "converted, born again." She had no more spiritual bond with us, she thought, than she had with a heathen or a Papist. (1.154)

Because Alton's mother is unsure whether her children are preordained for salvation, she refuses to cultivate close relations with them; the belief in God's purpose itself is no

guarantee of moral good. For her, religious devotion is identical with "rule and method." As a basis for sympathy and "'spiritual affection'," such dogmas can only distort the truth of God's laws. Instead, Alton suggests, higher meaning is found in the immediacies of everyday experience. "Poor, beloved mother!" Alton exclaims. "If thou couldst not read the answer, written in every flower and every sunbeam, written in the very fact of our existence here at all, what answer would have sufficed thee" (1.154). Departing from "rule and method," Alton wishes to invest value in the unmediated truth of the mundane. This perspective, of course, was also that of many natural theologians at mid-century: God's good intentions could be seen "written in the very fact of our existence here," so that, with sufficient study, "every flower and every sunbeam" could lead to an inclusive account of the cosmos. Thus, the lay observer could end with the same results found in more specialized religious accounts, so as to arrive at the same viewpoints appearing in the work of Whewell, Herschel, and others during these years.

The poet's faith in the powers of personal experience is central to *Alton Locke*, as he advances towards a more mature perspective upon natural design. Moving from materialist heresy (immediately after his expulsion from home) to spiritual truth (in the finale, with his emigration from Britain itself), Alton attempts to arrive at a revitalized understanding of God's purposes in the world. In doing so, he encounters an assortment of teachers: these include the bookseller and moral force Chartist Sandy Mackaye, the physical force Chartist John Crossthwaite, the amateur naturalist and country gentleman Dean Winnstay, Winnstay's niece Eleanor Staunton, and her daughter, the heiress Lillian Stansby. None of these figures offer a complete, comprehensive account of spiritual truth. Instead, they lead Alton progressively towards a vision of his own. Accordingly, as the

novel is at pains to show, it is possible for anyone to arrive at God's principles without access to formal theological learning.

Alton's early mentors, the Chartist sympathizers Sandy Mackaye and John Crossthwaite, prove formative in this process. Mackaye and Crossthwaite embody forms of political materialism becoming popular among British workers in the 1840s. These characters stand in clear contrast to the study of natural science that Alton undertakes in the final chapters. For example, Mackaye's motto, "Go experiment upon common life" ("Fiat experimentum in corpore vili"), neatly reverses Alton's final injunction to "seek out...fresh physical and spiritual laws" (2.331). The Chartist John Crossthwaite states this sort of radical credo all the more forcefully. "“Every one fancies the laws which fill his pockets to be God’s laws,” Crossthwaite says. “But I say this, if neither government nor members of Parliament can help us, we must help ourselves. [...] Combination is our only chance" (1.274). For Crossthwaite, "God's laws" are contingent and thus subject to challenge; God's laws are really just convenient human laws. Accordingly, Mackaye and Crossthwaite appear in inverse relationship to Alton's later turn toward religion; their materialism neatly reverses the terms of Alton's later study of the material world itself.

At the same time, however, the actual *effect* of the story is to show how spiritual truth remains unavailable and routinely out of reach in light of the fact of material domination. Alton's account of the urban slums in chapter eight, for example, becomes the occasion not so much for moral commentary as the evacuation of the speaker's subjectivity itself. Far from providing a means to self-realization, the conditions of the working poor result in the very dispersion of the self. As in the more famous Chartist rioting scene in chapter thirty-five, Alton's perspective is distributed throughout the

surrounding environment.[45] He comments:

> Foul vapours rose from [...] the doorways of undrained alleys, where the inhabitants carried the filth out on their shoes from the back-yard into the court, and from the court up into the main street; while above, hanging like cliffs over the streets--those narrow, brawling torrents of filth, and poverty, and sin. (1.186)

Whereas Alton had claimed to see God in "every flower and every sunbeam," there can be no basis for such enlightenment in this state of affairs. Much to the contrary, his perspective is generalized into a panoramic account of the urban slums, dispersed like "[f]oul vapours" upon an assortment of individuals moving all at once from alleys, backyards, courts, and main streets. The chapter continues in an extended excursion into the urban environment. As the scene unfolds, what is most notable is not so much Alton's moral outrage, but the absence of any articulate response at all. The failure of higher meaning becomes most palpable at the end of the chapter, when a working woman rejects his offer of "two or three shillings." "No; you're a working man," she replies, "and we won't feed on you--you'll want it some day--all the trade's going the same way as we, as fast as ever it can!" (1.192). In lieu of a prescriptive spiritual account of life in the slums, the text turns to determination of the marketplace and of "trade." When Mackaye appears in the final lines and invokes God's will, it is precisely to suggest His powerlessness. "All around ye," Mackaye says, "in every gin-shop and costermonger's cellar, are God and Satan at death grips" (1.192). If Mackaye's maxims are typically ironic in nature, here they serve to voice the ideology of the text itself.

While working to reveal God's higher purposes, then, the novel continues to affirm the very materialism that it seeks to define itself against. Here as elsewhere, the repeated representation of the urban poor led Kingsley away from spiritual exegesis, and instead towards a sympathetic account of politics. This is to say that Alton's awareness of

his marginality and that of his fellow workers ultimately undermines any proscriptive account of religious truth. As it turns out, his intellectual development is an education in what can no longer be believed: that the natural order is God's order, and that it demonstrates His good will towards humanity as a whole.

The breakdown of providentialist meanings in *Alton Locke* becomes all the more apparent when Alton actually undertakes the study of science. His apprenticeship to the Dean of Winnstay, a country gentleman and naturalist, makes the study of "God's law" central to his development as a poet. "The true poet, like the rational Christian," says Winnstay, "believes that inspiration is continual and orderly, and that it reveals harmonious laws, not merely excites sudden emotions" (2.12). For Winnstay, good art draws upon "the details of practical science" and the principles of natural order. Alton must renounce his radical beliefs in favor of the unchanging truths of providence. By attending to the fixed, inflexible relations among species, Winnstay suggests, Alton can arrive at a better understanding of the laws of human life—namely, the virtues of deference, distinction, and a firm separation between social classes. For this reason, he is tasked to study the eighteenth-century taxonomy of Linnaeus and Linnaeus's classical forbears. And in this manner, Winnstay's views provide a conservative, Christian counterpart to the radical materialism of Mackaye and Crossthwaite.

In several ways, Winnstay's philosophy corresponds closely with the main lines of theological thought in the first part of Victoria's reign. Nature is not only rationally organized but also prearranged as a stable and unchanging system. For Winnstay, each element in nature has an essential place; everything in the world has a timeless and transcendent identity, so that God's creation remains impervious to alteration or change.

He explains:

> They say, man is the microcosm, Mr. Locke; but the man of science finds every worm and beetle a microcosm in its way. It exemplifies, directly or indirectly, every physical law in the universe, though it may not be two lines long. It is not only a part but a mirror of the great whole. It has a definite relation to the whole world and the whole world has a relation to it (2.16).

The operations of the cosmos everywhere express the interconnection of the "great whole." For the "rational Christian," any individual instance in the world can reveal "every physical law in the universe." Kingsley himself had great sympathy with these views, which were promulgated widely by the theologians who he knew and studied. But by the same token, Kingsley's desire to uphold the potential for social mobility led him to argue against these very ideals. As it turns out, Alton's ability to understand Winnstay's system is anathema to that system itself. The poet's aptitude for learning, in other words, means that such essentialist hierarchies are arbitrary and contrived. “I question whether the good Dean would have been well satisfied," Alton explains, "had he known how all his scientific teaching confirmed my democratic opinions. The mere fact, that I could understand these things when they were set before me, as well as anyone else, was to me a simple demonstration of the equality in worth, and therefore in privilege, of all classes” (2.18). Alton's knowledge of natural laws ends in the discovery that such knowledge is by definition defunct. When Alton departs from Winnstay's company, it is to reveal the misguided premises of Winnstay's "harmonious laws" altogether (2.12).

Alton's denial of "the good Dean," then, is not a new sign of spiritual progress so much as it is a confirmation of what the novel has tended to show all along: the inadequacies of older providentialist doctrines in the midst of contemporary strife. At every turn, Alton's interactions with those around him---his mother, Mackaye and

Crossthwaite, and Winnstay--suggest the shortcomings of any single explanatory framework. In the plot of *Alton Locke,* there can be no stable system of relationships between characters. Instead, Alton remains an isolated individual, an aberration who fails to fit within a greater group. Whether appearing among the Chartist radicals or the Cambridge intelligentsia, the urban poor or the country elite, he finds no common connection to others over the course of the plot. And in this sense, Alton's failed relationships recapitulate the patterns of breakdown that he witnesses within British society as a whole. His personal experience, that is, serves as a metonymy for the absence of community all around him.

These sorts of non-religious meanings culminate in the final gestures of the novel, starting with the so-called "dreamland" sequence in chapter thirty-six. Triggered by Alton's descent into fever after participating in the Chartist riots of April 10th, 1848, the episode takes him through an inset narrative of evolutionary change. Inspired by the theories of Jean-Baptiste Lamarck, the episode draws upon Lamarckian concepts of moral hereditary--the theory of "soft" inheritance, in which organisms impart traits through personal application and usage over the course of a lifetime. Eleanor Staunton, the Dean of Winnstay's niece, appears at the start of the dream to clarify his task:

> And Eleanor said, "he who falls from the golden ladder must climb though ages to its top. He who tears himself in pieces by his lusts, ages only can make him one again. The madrepore shall become a shell, and the shell a fish and the fish a bird, and the bird a beast; and then he shall become a man again, and see the glory of the latter days." (2.261)

Alton's role in the violence of 1848 means that he must remake himself spiritually at each stage of the dream (as a madrepore, shell, fish, and so on). At each point along the way, his developing moral impulses allow him to climb the "golden ladder" and to become

increasingly human again. Thus, reified scientific theory is mobilized in support of an ideology of moral management. As it turns out, spiritual progress is supported by the fact of evolution: the scheme of nature really does promote human values, after all.

Whereas Winnstay's approach to nature entailed the taxonomical study of objects, the dreamland episode suggests a vastly different form of analysis-- the interpenetration of the observer and his objects, a kind of autoethnographical enterprise in which the self is fashioned in the act of self-description. Indeed, the pleasure of the episode inheres in the linkage between the narrator's perspectives and the specimens he describes:

> I was a mylodon among the South American forests—a vast sleepy mass, my elephantine limbs and yard-long talons contrasting strangely with the little meek rabbit's head, furnished with a poor dozen of clumsy grinders, and a very small kernel of brains, whose highest consciousness was the enjoyment of muscular strength. […] Much as I had envied the strong, I had never before suspected the delight of mere physical exertion. I now understood the wild gambols of the dog, and the madness which makes the horse gallop and strain onwards till he drops and dies. They fulfill their nature, as I was doing, and in that is always happiness. (2.265-6)

The scientist is imbedded in his own field of observation, so that social and scientific perspectives converge. Whereas Winnstay had assumed the essential stability of natural forms, Alton's development now rests upon nature's powers of endless change. "Believe at last that you are in Christ," as Eleanor explains later, "and become new creatures" (2.302). Through the transformation of the inward self, Alton learns, individuals can bring about a radically reformed social order.

Accordingly, when Alton awakens from the dream, it is to arrive at a new vision of social and spiritual reform. The aftermath of this vision forms the major focus of the ending, as Eleanor nurses Alton back to health. She serves as Alton's final guide in the novel:

> Men have fancied they have found it [the kingdom of God] in this system or in that, and in them only [...]. But it has gone its way—the way of Him who made all things, and redeemed all things to Himself. In every age it has, sooner or later, claimed the steps of civilization, the discoveries of science, as God's inspirations, not man's inventions. In every age it has taught men to do that by God which they had failed in doing without Him. It is now ready, if we may judge by the signs of the times, once again to penetrate, to convert, to reorganize, the political and social life of England, perhaps of the world; to vindicate democracy as the will and gift of God. (2.300)

The "discoveries of science" are not "man's inventions" but God's, so as to align social progress with the order of providence. Like the theories of Lamarck in the dreamland sequence, these discoveries promise to remake "political and social life." Out of the study of natural science, then, it is possible to bring about a revitalized social order.

With this re-invigorated vision of science in mind, the novel brings Winnstay back into the action again. Just as Alton has renounced his more radical sympathies after the April 10th riots, Winnstay has given up his own conservative orthodoxies. In the finale, Winnstay appears in a new position of moral authority. "Nature's deepest laws, her only true laws," Winnstay says, "are her invisible ones. All analyses (I think you know enough to understand my terms) whether of appearances, of causes, or of elements, only lead us down to fresh appearances--we cannot see a law, let the power of our lens be ever so immense" (2.306). The laws which would renew society are quite literally impossible to see. In this manner, Winnstay wants to preserve a place for imperceptible laws of order which can never be proven, but which still persist in contemporary life. He concludes:

> The true causes remain just as impalpable, as unfathomable as ever, eluding equally our microscope and our induction--ever tending towards [...] some great primal law, I say, manifesting itself, according to circumstances, in countless diverse and unexpected forms—till all that the philosopher as well as the divine

> can say, is--the Spirit of Life, impalpable, transcendental, direct from God, is the only real cause. (2.307)

The implicit tension between Eleanor and Winnstay is key. The study of God's plan in nature will help to revitalize Victorian society, as Eleanor suggests; but for Winnstay, what is most important about that plan is that it resists reason, so that "true causes" and "law" remain not only "impalpable," but also inherently "unfathomable." In answer to Alton's ambivalence about the status of knowledge in the opening chapter ("*if* I have learned"), what he learns about "God's laws" is that they cannot be learned at all. Just as God's mercy and justice are inherently impossible for the human mind to comprehend, so, too, is His created world.

As if to confirm this point, the impossibility of new natural "law[s]" (2.307) is then enacted as an actual principle of plot. Just after learning that God's plan is "unfathomable" (2.306) Alton is enjoined to travel to North America on a scientific expedition to see the fecundity of God's world. As Eleanor suggests, the discovery of "fresh spiritual and physical laws" will revitalize an enervated England:

> Go for me, and for the people. See if you cannot help to infuse some new blood into the aged veins of English literature; see if you cannot, by observing man in his more simple and primeval state bring home fresh conceptions of beauty, fresh spiritual and physical laws of his existence, that you may realize them here at home—(how, I see as yet but dimly; but He who teaches the facts will surely teach their application)—in the cottages, in the playgrounds, the reading-rooms, the churches of workingmen (2.331).

These new "laws" promise to reveal order in the midst of contemporary confusion. By observing an earlier state of civilization, Alton can bring back to England and to "English literature" a better sense of how to reconcile the fact of social breakdown with religious truth. If *Alton Locke* suggests the bankruptcy of older theodicies of nature—the concepts

of perfect order, stability, and interrelationship handed down by Paley and his peers—then new "discoveries in science" might make a better foundation for English novelists in the future.

Nevertheless, these "fresh physical and spiritual laws" remain out of reach for both Alton and for the text of *Alton Locke* itself. As soon as he is cast out of England, Alton is stricken down by cholera and dies without a single scientific discovery. The effect is to emphasize the absence of achievement in Alton's life. There is no conclusive, romantic union with Eleanor, no renewed relationship with Crosthwaite, no new "laws" of nature or successful work of popular poetry. Instead, his final feat is the story of his unredeemed failure. As the fictional editor, Mackaye, writes in the last chapter, "[o]n the very night on which he seems to have concluded [the story]--an hour after we had made the land--we found him in his cabin, dead, his head resting on the table as peacefully as if he had slumbered" (2.336). Despite all the novel's emphasis on the essential coherence and closure of God's plan, such tendencies are precisely what neither Alton nor *Alton Locke* can show in the end. Alton has neither found higher meaning in the 1840s, nor crafted the poetic masterpiece which was "God's purpose" in making him suffer in the first place. At the end of Alton's life, the laws of organic order remain just as inoperative as they were at the start of it.

Despite its best efforts to affirm natural theological doctrines, then, *Alton Locke* turns out to reflect their bankruptcy. There can be no perfect fidelity between part and whole, the individual and the group. Alton's death, alone and abroad, marks his failure to bring about a more inclusive social system. Held up as a poet of the people, in the end his exceptional status becomes a sign of essential insolvency; far from a figure of

interconnection and change, Alton remains unrecuperated within the greater group. Kingsley's effort to create an exemplary working man foundered on his inability to resolve the moral issues he has raised. Just as theologians like Whewell and Herschel in the 1830s and 1840s were working to reconcile the individual deviation with the overall order of the whole, Kingsley's novel registers a similar struggle in the pages of his novel. Faced with the competing implications of order and decay, integrity and dispersion, the individual exception remains irreconcilable with the traditional tenets of natural theology. The effect, in *Alton Locke,* is to undercut the novel's own efforts at formal and conceptual coherence.

Nevertheless, these instabilities in Kingsley's novel were themselves signs of the developing direction of science in the years to follow. Over the course of the 1850s and 1860s, patterns of non-productivity would find formative expression in scientific thought, so as to make such failures of fit into a new basis for organic relations. What this meant was that the unrecuperated relationship between the part and the whole became a central theme within the epistemology of science. "[T]he universal law of decay," as Whewell called it, would become a focus for scientists during these years, in fields as diverse as physics, physiology, and evolutionary biology. In their engagements with these theories, moreover, English novelists would work to imagine the means to moral and social amelioration. This is to say that the patterns of breakdown that *Alton Locke* cannot comprehend were precisely those that subsequent novelists would embrace.

Accordingly, Alton's contribution to the "future of English literature" takes shape in his inability to make a contribution at all. If Alton cannot return to England with "discoveries in science," then his death demonstrates the incipient concerns of science

itself. In the next chapter, I turn to Kingsley's friend and fellow Christian, Charles Dickens, who was also working to address the rampant materialism of the hungry forties in *Dombey and Son* (1848). Dickens's bachelors Sol Gills and Ned Cuttle, like Kingsley's Alton Locke, fail to reproduce or to serve any productive social role. But while these tendencies serve to destabilize the ideals of *Alton Locke*, Dickens was led to explore the more positive potentials of such (re)productive failures themselves. If Kingsley's novel looks back to the shortcomings of an antiquated theodicy of nature, then writers such as Dickens were starting to explore more innovative ideas of natural breakdown as an actual basis for social progress.

NOTES

[32] Gallagher, Catherine. *The Industrial Reformation of English Fiction.* Chicago: U of Chicago Press, 1985. 98. Rauch, Alan. "The Tailor Transformed: Kingsley's *Alton Locke* and the Notion of Change," *Studies in the Novel* 25.2 (1993): 196-213.

[33] Uffelman, Larry K. *Charles Kingsley*. Boston: Twayne, 1979. 16.

[34] *Ibid*. 26.

[35] Kingsley, Charles. "Good Words," in *Scientific Lectures and Essays*. London: Macmillan and Co., 1880. Critics have long highlighted Kingsley's interest in contemporary science, but mostly in relation to new evolutionary concepts. Cf. Merrill, Lynn L. *The Romance of Victorian Natural History*. New York: Oxford UP, 1989; O'Gorman, Francis. "Victorian Natural History and the Discourses of Nature in Charles Kingsley's *Glaucus,*" in *Rethinking Victorian Culture*, ed. Juliet John and Alice Jenkins. St. Martin's: New York, 2000.

[36] For influential surveys of natural theology, cf. George Levine, *Darwin and the Novelists.* Chicago: U of Chicago Press, 1992; Robert M. Young, *Darwin's Metaphor*. Cambridge: Cambridge UP, 1995; J.M. Klaver, *Geology and Religious Sentiment.* Boston: Brill, 1997.

[37] Cf. Smith, Crosbie. *The Science of Energy: A Cultural History of Energy Physics in Victorian Britain*. Chicago: U of Chicago Press, 1998. 87.

[38] Whewell, William. *Astronomy and General Physics Considered with Reference to Natural Theology.* London: Bradbury and Evans, 1862. 9.

[39] Cf. Levine, George. *Darwin and the Novelists*. Cambridge: Cambridge UP, 1988. 46-52. Also cf. John Robson, "The Fiat and Finger of God," in *Victorian Faith in Crisis*, ed. Bernard Lightman. 71.

[40] Quoted in Robson, 112.

[41] Herschel, John. *A Preliminary Discourse on the Study of Natural Philosophy*. London: Longmans, 1831. 27.

[42] Kingsley, Charles. "Town Geology," in *Scientific Lectures and Essays*. London: Macmillan and Co., 1880. 16.

[43] Gallagher, 87.

[44] *Ibid*. 92.

[45] Cf. Gallagher, 96-98.

Chapter Three

"A Nat'ral Born Friend": Friendship, Filiation, and the Family of Man in *Dombey and Son*

Charles Darwin's evolutionism everywhere expresses the relations of survival and loss. In what Darwin defined as "the great battle for life," species struggle to preserve and to perpetuate personal interests against an assortment of rivals—a conceptual program that recent cultural historians have hastened to align with the compulsions of an increasingly individualistic, crassly commercial British nation.[46] Stephen Jay Gould famously characterized the theory of natural selection as "the economy of Adam Smith transferred to nature," while Adrian Desmond and James Moore have more recently emphasized Darwin's collusion with "the competitive, capitalistic, Malthusian dynamics of a poor law society."[47] Current literary criticism reaffirms readings such as these in light of Darwin's own cultural influence. Positioning Charles Dickens's *Our Mutual Friend* (1868) alongside emergent epistemologies of science, for example, Howard W. Furweiler argues that Dickens "transcends and opposes both the Malthusian and the Darwinian constructs" to inaugurate an alternative order of "moral community" (56). For critics such as Furweiler, Darwin's world works to naturalize the world of political economy and the prerogatives of personal profit; seen as a synonym for selfish struggle, Darwinism can signify only as a negative version of the morally sanctimonious

assumptions in fiction.[48]

By demystifying Darwin's theory as the symptom of more multifarious individualistic ideals, however, critics have paradoxically precluded further discussion of the relations between nineteenth-century novels, evolutionary science, and their common conditions of expression at mid-century. While Darwin did divulge the tendencies towards collective conflict in nature, his writings rarely derive meaning from isolated individuals alone. Far from sanctioning the sole strictures of personal gain, he laid stress upon the perpetuation of a shared stock—those genetic potentials latent within particular organisms. In fact, in a series of interconnected instances over the course of his career, Darwin worked to explain the evolutionary bases of community, cooperation, and other collectivist sentiments. These inquiries came to converge around a seemingly insuperable paradox: why would nature select sentiments and tendencies towards altruism, self-sacrifice, and unreturned aid, which would only hinder individuals in the struggle for inheritance? The foundations of an answer to this question can be traced to Darwin's earliest musings on moral philosophy in the later 1830s and early 1840s, which themselves prefigure the fully-articulated arguments on moral evolution in *The Descent of Man* (1871) and afterwards. Taken as a whole, these writings reflect the positive potential for moral progress in a world released from providential fiat. By highlighting how nature selects at the level of the group as well as at the level of the individual, Darwin dramatized the ways in which confederate communities could win out against aggressive, avaricious individuals, so as to suggest the ongoing growth of the social good. As Darwin found, the very defeat of the self could become the best means possible of safeguarding one's traits in the future.

This chapter considers several formative instances in which Darwin was led to re-organize the oppositional logic of loss and gain to show how individuals could lose in order to win, perversely repudiating self-interest in order to extend their genetic fates far beyond the purview of the self as such. In the cases of sterile and sexually anomalous agents in particular, Darwin discovered that individuals could actually abnegate and refuse personal privileges in order to invest value within the larger life of the group, vitalizing the community even and especially as their traits worked against the immediate legacies of the self. Precisely by turning away from more direct modes of coherent self-realization—the expression of one's interests in particular reproductive partners--these individuals strategized their continuation in more mediated, wayward, and roundabout routes within the larger social whole. As embodiments of altruism and unreturned aid, Darwin found, they preserved their traits through the preservation of other relations within the community. As it turned out, infertility and abstemious sexual sacrifice were not antithetical to organic order; far from it, such unproductive impulses signified as a powerful form of social potency.

Focusing upon the close conceptual linkages between Darwin's narrative of group selection and the developing patterns of mid-nineteenth-century novels, this chapter shows how the post-individualistic perspectives of multi-plot fiction at once informed and radically re-configured theories of social relationship taking shape in evolutionary science in the same space of years. As a case in point, I turn to Dickens's extended exploration of sexual struggle and sexual sacrifice, *Dombey and Son* (1848). While Dickens's novel resonates richly with the terms and tropes of the Darwinian framework, it does so nowhere more powerfully than in the affairs of its unmarried men--namely, the

two bachelors and "intimate friend[s]," Sol Gills and Ned Cuttle (*D*, 260).[49] Just as Darwin deliberated upon the generative outcomes of infertility, Dickens's novel reflects the paradoxical potency of it marginal male figures, making such nominally unrenumerative impulses a positive foundation for organic community. The effect in both cases was to challenge the centrality of the reproductive body as a locus of the self, softening the sharper edges of nature's selective processes by showing how one's traits could continue to persist even and especially after failing to find direct expression in another. In this sense, both writers were working to blur the boundary between survival and self-defeat so as to reveal the endless circulation of personal impulses within the community at large. Ultimately, in expressing the intricate interrelations between individuals and groups, this perspective provided an ideal for the organic development of the multiplot novel--revealing a traffic in ideas which was, at the same time, also a traffic in forms.

Just as George Eliot's *Middlemarch* (1872) would turn to new scientific studies of entropy and irreversible loss as the model for an ameliorated social order, Dickens devised an analogous ideal of influence, showing how individuals might refuse the aims of self-perpetuation in order to further the aims of the aggregate group. In *Dombey and Son*, such refusals are cast in terms of sexual parturition, in contrast to Eliot, who would employ the idioms of post-classical physics as a more general heuristic device for figuring sympathy and self-denial. But for both Eliot and Dickens, the fragmentation of older theodicies of nature—premised upon a perfect, seamless system of Creative contrivances for human life—was not felt as a tragic failure, an absence within the epistemic horizons of the time, so much as an opportunity to imagine a set of post-

subjective perspectives premised precisely upon such forms of failure, inefficiency, and prodigality in the natural economy. Thus tracing the ties between the perspectival patterns of fiction and the developing discourses of science, this chapter charts the polymorphous potentials of non-reproductive desire at mid-century, showing how scientists and non-scientists worked together to derive a counterintuitive vision of organic order out of the very fact of a disordered ideology of nature.

To be sure, *Dombey and Son* draws upon the traditional rhythms of the marriage plot, and advances steadily towards the union of Florence Dombey and Walter Gay. In the concluding chapters, the births of their children consecrate a newly successful family lineage. But for the major part of the plot, the story actually displaces its romantic male protagonist from the action altogether, so as to shift the focus instead to the opposition in the earlier generation: specifically, between the forlorn husband and wife, Paul Dombey and Edith Dombey (on the one hand) and the two "intimate friend[s]," Gills and Cuttle (on the other hand). At the heart of this tension stand two competing conceptions of family itself. Time and again, the text juxtaposes Dombey's desire to create another "perfect Dombey" (16), a son and heir to further the family firm, while the surrogate sons and daughters dwell with the two unmarried men. The major movement of the plot will be to make their fictional family real, sliding from Dombey's ideal of direct descent to the latent interrelations inhering within the larger family of man. Like Darwin himself in the years to follow, Dickens dramatized the vicarious successes of figures such as Gills and Cuttle to show the common origins of organic life, the "one mother" and "true Father" of our shared humanity.

Gills and Cuttle are deemed unproductive in two ways: first, they resist the

materialistic mandates of Dombey's counting house and home; and, secondly, they repeatedly renounce the terms of reproductive sexuality as such. With remarkable regularity, Gills and Cuttle decline the prospects of a "capital, cosey old lady" in order to further the offspring of others: namely, Florence Dombey, Walter Gay, Toots, and Rob the Grinder (133). While their altruistic actions are deemed detrimental to themselves, the story works to show how such other-directed drives pay off for their "family" fortunes. In the shift from the decline of Dombey's company House to the serendipitous success of Gills and Cuttle, *Dombey and Son* suggests the positive value of unreturned aid in invigorating the larger life of the community. The effect is neither to reject the marketplace nor to retreat to a domestic domain purified from its putative other, but rather to show how such economies of loss could re-make market relations in light of a more melioristic model of community. In place of self-interested individuals, *Dombey and Son* suggests a perspective on organic relations released from the narrow structures of the self as such.

Far from appearing in opposition to novelists such as Dickens, then, Darwin's evolutionary theory actually absorbed contemporary responses to political economy and the intellectual legacies of laissez-faire, so as to incorporate and advance upon the moral and epistemological postures made available by his literary counterparts. Darwin famously carried a copy of Milton's *Paradise Lost* aboard his landmark *Beagle* expedition in the 1830s, reading it continuously while working out his formative theories of organic change. An avid reader of Dickens himself, Darwin also enjoyed an assortment of popular novelists including Jane Austen, Walter Scott, and others who would continue to inflect both the style and the structure of his thinking. His scientific

writings run replete with literary allusions, turning routinely to popular fiction for actual evidentiary cases. For example, Darwin would invoke a description of the mob in *Oliver Twist* (1838) for his argument that human expressions reflect fundamental animal behaviors.[50] In both explicit expressions of influence and in more latent alignments, Darwin reflected the concerns of popular novelists in theorizing the nature and effects of organic change.

But the traffic in ideas between scientists and non-scientists worked in two ways, suggesting a shared vocabulary of order, reference, and representation. For his part, Dickens cultivated congenial ties with intellectual luminaries like Michael Faraday and Richard Owen, and actively enlisted their input in *Household Words* and *All the Year Round*.[51] These journals became regular vehicles for popular scientific prose, as they translated new discoveries into everyday expressive contexts. The details of Dickens's novels carry these connections in an assortment of ways, as well. They reflect at length upon recent developments in astronomy, physics, chemistry, and geology, both in explicit expressive instances and in the conceptual contours of his plots. Like Darwin's narratives, his novels turn typically upon the struggle for inheritance and parturition, posing problems of competition and conflict in the furtherance of family fortunes. And although death and decay are inexorable, the fact of death is itself re-defined as a condition of abundance and further superfercundity in the future. Above all, for both Dickens and Darwin, the appearance of difference and disparity gives way gradually over time to the interconnection of the greater group. This is to say that the principles of perspective and form, in Dickens's novels, reflect the same sort of orientations taking shape in evolutionary science in the same space of years, creating conceptual linkages even in the

absence of explicit authorial intention.

We see these linkages in several specific ways around the time of *Dombey and Son* itself. Just as Darwin deliberated upon the ways in which "change creates change" in his unpublished notebooks of 1837-8, the narrator in Dickens's *Martin Chuzzlewit* (published less than two years before *Dombey and Son*, in 1844) drew upon the same gradualist geology to explain that "[c]hange begets change." In the endless permutations of organic nature, organisms and objects possess purely temporary and relational identities; "[n]othing propagates so fast," Dickens's narrator notes, so that "what was rock before becomes but sand and dust." In his next novel, *Dombey and Son*, Dickens would enlarge this observation into a comprehensive account of social life. "It's a world of change," in the words of Dombey's sister, Mrs. Chick (448). Within this state of affairs, can be no stable essence for the Dombey dynasty, but only a series of shifting interactions which work to re-cast the essential identity of the Dombeyan lineage as such. Individuals are constituted and constantly re-constituted through their endless exchanges with one another, deferring the desire for an autonomous, achieved identity in the present. For this reason, the appearances of order and self-containment are really illusory--simply signs of a much richer range of influences inflecting the fate of organisms.

These tensions--between integrity and dispersion, self-containment and excess--would have been especially pressing for Dickens as he set out to compose the novel. Departing from the sprawling, episodic configurations of *Barnaby Rudge* (1842) and *Martin Chuzzlewit* (1844) *Dombey and Son* was Dickens's first to proceed from a carefully-planned scheme for future numbers. While preserving his attraction to more minor, grotesque characters and extended discursive flights, the story sought to align

those tendencies with a newfound formal coherence. In fact, such polarizing impulses find focus at the level of character, in the juxtaposition between Paul Dombey (who desires to produce another "perfect Dombey" and male "issue" (16, 514)) and his apparent opposites, Gills and Cuttle (who are defined by their very refusals of direct descent). By embracing the perverse potency of those subjects, Dickens enshrines them as a new, more expansive basis for organic order, offering a positive foundation for the future integrity of *Dombey and Son*'s own individual serial "issue[s]" (514). The development of this formal order—dramatized in Dickens's novel and developed in science--forms a central part of my purposes, here. Charting the movement of ideas between scientists and non-scientists, my aim is to highlight how the impossible economies in novels found focus in evolutionary narratives at the same time, offering a standard of influence for both organic community and for the unproductive powers of British multiplot fiction.

I. A Natural History of Morals: Love and Friendship in the Language of Early Evolutionism

Charles Darwin wrote often on the evolution of moral life. Time and again, he highlighted the traits that tie communities together and ensure their continuing vitality in the future: specifically, the rewards of character, conscience, and the social sentiments. These concerns coalesced around his early explorations in natural history, composed over the later 1830s and 1840s, and continued up through the more mature transmutation theories taking shape in the 1850s and thereafter. Darwin granted that individuals were self-regarding—above all, evolutionary agents aimed to advance their lineages and to accumulate richer resources in nature. But this did not necessarily negate feelings of duty,

sympathy, and love, or obscure their special utility in the social lives of organisms. In one example from *The Descent of Man* (1871), he observed that bee colonies conceived sterile members whose sole function was to gather food for others, repudiating reproduction in order to improve the overall health of the hive. As Darwin explained, these members expressed their interests indirectly in the survival of less immediate relations; although abstracted from the self, their interests inhered in more mediated ways within the larger life of the group. Just as Darwin defined death as a condition for further variety and variation, he came to see selfish impulses as a cause for sympathy, self-sacrifice, and the gradual growth of fellow-feeling in the world.

By mid-century, Darwin's writings would come to exert enormous influence within the conceptual contours of British thought, and galvanized a range of literary and scientific genres. But by the same token, Darwin's work was wedded ineluctably to the moral and epistemological models available to him in his formative years. In its attention to the powers of fellow-feeling, his theory conforms to the increasingly constitutive values at the heart of the Victorian social establishment--specifically, with what Stefan Collini has characterized as the culture of altruism. Within this context, the virtues of duty, sacrifice, and self-abnegation assumed axiomatic meaning. Defined in opposition to theories of rational self-regard, the rhetoric of altruism could be mobilized in order to pull upon the heartstrings and ameliorate an array of social problems. James Stuart Mill typifies this trope in *Utilitarianism* (1863), where he writes, "selfishness [is] the principal cause which makes life unsatisfactory"; but by the same logic, a solution to life's dissatisfactions stood in "a fellow-feeling with the collective interests of mankind."[52] Mill's comment marks just one instance of a broader cultural strategy suffusing

nineteenth-century thought, an explanatory pattern predicated upon a basic polarity between "selfishness" and "fellow-feeling." The two terms afforded a remarkably fungible framework for theorizing the changing nature of social experience. It was reversible in the sense that the opposition of self-possession and self-loss solidified within a range of competing, even contradictory instances, so that no single meaning emerged out of its increasingly involuted articulations at mid-century.

Darwin's writings form one site within this larger cultural ethos. Through a range of readings and personal relationships during these years, Darwin defined a theory of moral progress that valorized precisely those concepts of community, cooperation, and altruistic action that pervaded mid-Victorian codes of conduct generally. There were three specific stages in the transmutation of moralities as Darwin defined it: the incipience of the social instincts, their elaboration through the mechanism of natural selection, and their eventual emergence into conscience. First, filial and parental impulses developed to include the larger community—either through the survival of more sociable organisms over time, or through those individuals' own, actively cultivated cooperative habits. In species that had evolved expressive vocabularies and intelligence, moreover, these characteristics became reinforced through modes of commendation and critique, so that over the *long durée* they became fixed, instinctual, and innate to the constitution of species.[53] In this way, Darwin translated contemporary canons of morality into the automatic processes of nature itself. He accepted the innate identity of fellow-feeling—its essential, shared status in humankind—only to argue how, at the same time, it arose from an ongoing history of inheritance, adaptation, and change.

This section traces the development of Darwin's moral and mental philosophy,

moving from his formative writings of the 1830s and 1840s to the more mature evolutionary views set forth in *The Origin of Species* (1859) and *The Descent of Man* (1871)—an assortment of texts that, taken as a whole, constitute a more or less integrated inquiry into the evolution of conscience. The section turns to one central concern in Darwin's developing theory: the social utility of seemingly useless impulses, and, specifically, what Darwin saw as the bewildering persistence of fellow-feeling in nature. For Darwin, selfless behaviors seemed by definition detrimental to the self. Given the imperatives of personal progress, individuals could hardly benefit from forms of self-abnegation and unreturned aid. In the case of neuter individuals, most notably, altruistic actions actually prevented the furtherance of one's own lineage. But despite this fact, Darwin saw that nature selected and actively allowed the dissemination of such sentiments. What principles of selection, then, allowed for the propagation of these traits?

In addressing this dilemma, Darwin came to acknowledge the limits of any individualistic view of organic change. Cooperative communities were better suited to survive than less sociable ones, so that the former, collaborative characteristics came to be preserved as the latter lost sway. Simply put, nature could choose species at the level of the group as well as the individual. The point, for Darwin, was not so much to obscure the vicissitudes of social difference--the identifications and distinctions that invariably arose among communities. Rather, he wanted to observe how those disparities proved productive to the life of the larger aggregate. In envisaging the natural selection of groups, Darwin articulated a model of mutuality that invested value in the capacious characteristics that he identified in nature. Beyond the tendencies toward competition and avarice that he espoused elsewhere, Darwin saw that the natural economy extended to

more melioristic principles of duty, sympathy, charity, and love.

In this sense, Darwin defined the special prerogatives of feelings that seemed excessive and even explicitly deleterious to the self. As it turned out, altruistic agents had it both ways: they acted at once for others and for their own, isolated interests. In accounting for the persistence of fellow-feeling, Darwin rearticulated the opposition between the interests of the self and other-regarding behaviors in order to conceive a mutually beneficial model of social relationship, one that posited a functional symmetry between egoism and altruism in the general invigoration of the group. The story of how Darwin arrived at that theory, and its interpolation into the terms of other strategies of social exegesis (namely, those that took shape in Dickensian melodrama) forms my central concern in this section.

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In the first volume of *The Descent of Man*, Darwin speculates upon a projected archeology of morals. The origin of human moralities, he notes, "has been discussed by many writers of consummate ability; and my sole excuse for touching on it is the impossibility of here passing it over, and because, as far as I know, no one has approached it exclusively from the side of natural history."[54] Above all, Darwin was working to situate moral impulses in a continuum with the lower animals; however highly refined our social sentiments had become in modern life, they could be traced ultimately to a common lineage with less advanced organic forms. It is true that the outlines of this theory can be detected in the work of scientists such as A.R. Wallace, Robert Chambers, and others at mid-century.[55] Yet, with his emphasis upon the inheritance and selection of random variations, Darwin offered a new, distinctively novel

notion of organic change.

At the same time, Darwin's statement imparts a somewhat slanted perspective upon this shift. However singular it appeared, in fact Darwin's historical project remained inseparable from those scientists and social thinkers "of consummate ability" that he invokes. From his early years as a Cambridge undergraduate and afterwards, following his voyage aboard the *H.M.S. Beagle* between 1831-1836, Darwin gained fluency with a formidable range of studies from religious, social, and scientific perspectives. At Cambridge, he encountered a general curriculum centering around astronomy, biology, physiology, and political and moral philosophy. William Paley, Adam Smith, Edmund Burke, David Hume, and more recent thinkers such as James Mackintosh and John Abercrombie figured prominently. Upon his return from the *Beagle* expedition, moreover, he continued his studies with works by Paley, Harriet Martineau, James Mill, and an assortment of others—a range of readings which would continue to inflect his later evolutionary epistemologies.[56] To be sure, Darwin's work would claim considerable autonomy from former explanations of moral life, beginning with his unpublished *Essay* (1844) and again, more forcefully, with the eventual publication of *The Origin of Species* in 1859. But despite these disavowals, his writings also reflect a continuing interest in earlier modes of moral inquiry. Upon closer examination, as we shall see, Darwin's archeological enterprise existed ineluctably alongside prior philosophical systems.

One expressive engagement, indicative in scope, appears in Darwin's response to Adam Smith's *Theory of the Moral Sentiments* (1759) in his transmutation notebooks from 1837 and 1838. In the experience of sympathy, Smith argued, an individual inhabited the position of another and vicariously suffered their pain. As Darwin explains,

"Adam Smith (D Stewart Life of) says sympathy we can only know what others think by putting ourselves in their situation and then we feel like them—hence sympathy very unsatisfactory because does not like Burke explain pleasure."[57] In his departure from Smith, Darwin argues that there can be no convincing claim about altruism that cannot comprehend its internal sources in the self. Selfish sentiments, it turns out, are actually what compel forms of fellow-feeling. He explains:

> Fine poetry, or a strain of music, when the mind is rendered ductile by grief, or by bodily weakness, melts into tears, with sensations of sorrowful delight, very like best feeling of sympathy. Mem: burke's idea of sympathy being real pleasure at pain of others [...] otherwise as he remarks sympathy would be barrier and lead people from scenes of distress—see how a crowd collects at an accident—children with other children naughty. –why does person cry for joy? (282)

Darwin deliberates upon several, seemingly unrelated patterns of social and subjective experience: acute responses to music, infirmities tamed through tears, and outbursts of happiness are all rooted in the gratifications of others' "grief." In fact, we enjoy the suffering of others (the "real pleasure at pain of others"). These tendencies seem somewhat discomforting; but however anti-social they seem, such selfish instincts actually advance the aims of social cohesion and encourage attachment to others in "scenes of distress." For this reason, Darwin endorses Edmund Burke's theory of social sentiments as an alternative to Smith. Self-centered behaviors provide a bulwark for communities, inspiring individuals to cultivate communal bonds. Rather than seeing sympathy in opposition to self-interest, then, Darwin defined selfish sentiments as a firm basis for moral behavior.

For Darwin, modern systems of moral meaning were rooted in an assortment of more rudimentary needs. Far from valorizing the transcendent status of love, charity, and affection, Darwin would see these traits as the outcome of an ongoing competition for

life; they offered one species an advantage against others inhabiting the same environmental niche. The rudiments of this approach appear in the pages of the transmutation notebooks:

> May not moral sense arise from our enlarged capacity yet being obscurely guided acting or strongly instinctive sexual, parental, and social instincts giving rise "Do unto others as yourself. Love thy neighbor as thyself." Analyze this out, bearing in mind many new relations from language. The social instinct more than mere love—fear for others acting in unison.—active assistance, etc etc. It comes to Miss Martineaus one principle of charity.— (295)

"Moral sense" is severed from any priori precepts of right and wrong. Instead, it emerges out of other, slowly precipitating patterns of social relationship. In particular, Darwin writes, language allows "many new relations," linking individuals in increasingly sophisticated systems of praise and blame. What Darwin views as most meaningful about these systems--respectively, the injunctions to duty and love--is their very appearance as artifacts of language and an evolving expressive aptitude, not their inner spiritual content. (Thus, he wonders, "May not idea of God arise from our confused idea of 'ought'" (295).) The cultural canons of "[l]ove" find fresh significance from this perspective. While appearing absolute, in fact they take shape from the "social instinct[s]" alone, the bonds between individuals that ensure their long survival on the earth.

The allusion to Harriet Martineau's *How to Behave: A Guide to Morals* (1838) carries special salience in this light. While allowing the culturally conditioned roots of human morals (specifically, in early childhood customs and attitudes), Martineau also argued that certain characteristics concerning sympathy, charity, and love could become increasingly innate over time. Through the force of repeated, purposeful application, these tendencies could come to be established in our physiological constitution. For both Darwin and Martineau, then, moralities manifested from the long process of organic

change. "Martineaus one principle of charity" turns out to prove precisely those principles of evolution that Darwin installed at the center of his own system. He elaborates elsewhere in the notebooks, "Mart[ineau] allows *some* universal feelings of right and wrong and therefore in fact only *limits* moral sense" (279). But for Darwin, *any* feelings of right and wrong are capable of becoming intrinsic after many generations, given that the conditions of life allow them to evolve. It is not so much that Martineau's ideas were incorrect, then, but that they offered only a partial account of how the world worked.

Here as elsewhere, Darwin drew upon popular patterns of explanation in order to re-inscribe them in evolutionary terms. He was working in two ways: first, he interrogated the terms of common cultural assumptions; then, after refuting their status as self-evident artifacts of truth, he re-inserted them back into his own explanatory system. Nowhere is this process more apparent than in his response to William Paley, whose *Principles of Moral and Political Philosophy* (1785) animated much moral and mental thinking through the first part of Victoria's reign. Darwin would have encountered the text as an undergraduate at Cambridge. Shortly thereafter, too, he records reading Paley's *Natural Theology* (1805), a text that reiterated an analogous argument in more global terms. For Paley as for other Christian cosmologists, the laws of nature reflected the good intentions of a presiding Providence. As I noted in chapter two, for this influential scientist the world was constituted for the special preservation and improvement of human life, so that God's moral mandates were written into the operations of the cosmos at large.

Paley proposed a philosophy of rational self-interest that followed from this framework. He began by conceding that individuals tended to pursue personal pleasures;

and, he reasoned, the best possible pleasure in the world was the thought of eternal life. Paley's moral and mental philosophy was born out of this premise. Precisely by learning to embrace our greatest gratification--the idea of eternal happiness--we were also led to serve the greater good. In this sense, nature exhibited a "consilience of design," in the terms of William Whewell (Darwin's tutor at Cambridge and personal acquaintance afterward)).[58] There existed a complete conformity between the material dispensation and the moral disposition of humankind. Paley's proposals continued to shape philosophical debate through the 1820s and 1830s, and assumed epigrammic form in the so-called law of expediency, "the Will of God as Collected from Expediency," as Paley put it. As he explained in the *Principles*, "[w]hatever is expedient is right. It is the utility of any moral rule alone which constitutes the obligation of it" (66). Ultimately, "utility" is inseparable from self-regard; there can be no action for the true advantage of the self which does not also, at the same time, confer benefit to the larger social whole. Thus, the best arbiter of human morality becomes the measurement of self-interest.

As a young naturalist in the later 1830s, Darwin was willing to countenance certain claims set forth in the *Principles*. He agreed that the natural order ordained a fit between personal pleasures and what was right for everyone else. If individuals only observed their best interests, the world would become consummately reformed. But while working within a framework of personal expediency, Darwin distinguished himself by suggesting how such impulses precipitated purely from the imperatives of survival. Far from suggesting some apotheosis of the spirit, our moralities were contingent and changing, relative responses to the endless struggle for existence. As Darwin explained in 1838:

> I am tempted to say that those actions which have been found necessary for long generation (as friendship to fellow animals in social animals) are those which are good and consequently give pleasure, and not as Paley's rule is then that on long run *will* do good. Alter *will* in all such cases to *have*, and *origin* as well as *rule* will be given. (291)

For Darwin, relations of "friendship" are "good" only insofar as they help species to survive (that is, to encourage their "long generation"). Nothing in the world will guarantee what "will do good," since the needs of survival are shifting and ultimately unstable. The standards of the past offer little assurance as to the continuing truth of our moralities. But Darwin's point in the passage is not to repudiate Paley's philosophical system out of hand. Instead, he envisages his task as a quite-literal re-inscription of that system itself. He strikes out the imperative term "will" and replaces it with "have," so as to insert a rhetoric of origins rather than ends, of automatic processes (lawful "rule") in place of Providential fiat. If "Paley's rule" tried to say what our actions always accomplish in the world, then Darwin divorced them from any pan-social standard of value.

Darwin's reading of Paley's *Principles* functions metonymically to show how he was working with established moral and epistemological models in order to envision a radically new notion of social development. On the one hand, he wished to sanction the general tendencies toward fellow-feeling that he saw in contemporary culture--ideas inherited from Paley and more recent Christian cosmologists such as Whewell and John Herschel. But on the other hand, and in contrast to this tendency, Darwin wanted to stress the indeterminate outcomes of moral progress itself. The effect was to sanction the advancement of social sentiments, but only by reference to the rudimentary processes of organic nature. It was true that moral virtue was always advancing; but virtue advanced

with no necessary relation to any absolute, a priori system of right and wrong.

In Darwin's developing theory, then, morality appeared arbitrary and absolutely happenstance--one sign among others of external environmental determinations. For this reason, the natural world did not reflect the truth of human morals; much to the contrary, it exhibited an array of alternative notions of what was right. In the non-human world, other organisms assigned alien, even distasteful definitions to the moral good. *The Descent of Man* offers a case in point, as Darwin presents a thought-experiment on the social life of insect communities. He writes:

> If, for instance, to take an extreme case, men were reared under precisely the same conditions as hive bees, there can hardly be a doubt that our unmarried females would, like the worker-bees, think it a sacred duty to kill their brothers, and mothers would strive to kill their fertile daughters; and no one would think of interfering. Nevertheless the bee, or any other social animal, would in our supposed case gain, as it appears to me, some feeling of right and wrong, or a conscience. (122)

In this model of moral enmity, two main operations take place. First, Darwin assumes an antithesis between the morality of "men" and "hive bees," but then collapses that opposition into an assertion of actual equivalence. Within the world of bees, hatred and animosity towards one's relations—the active destruction of family--occupies precisely the same place, and has the same social function, as familial affection in human communities. Both behaviors would be experienced as a compulsion to proper conduct or "duty." Darwin had taken up the same scenario earlier, in *The Origin of Species*, to argue that "[w]e ought to admire the savage instinctive hatred of the queen-bee" since she labors "for the good of the community."[59] Our own standards of right and wrong were far from infallible. Instead, those standards followed from the specific needs of individuals in their environmental niches. In Darwin's words in *The Descent of Man*, "maternal love or

maternal hatred, though the latter fortunately is most rare, is all the same to the inexorable principle of natural selection." Darwin's point, here, was not just that alien social sentiments are also salutary and efficacious, but that they are also *correct*.

In all of these ways, Darwin was moving towards a secular system of morals, a theory that traced the automatic progress of virtue out of nature's own lawful regularities. Concepts of right and wrong were mere manifestations of environmental needs. But just as Darwin identified the precarious nature of moral life, an apparent contradiction took shape within his own system of explanation. For, the very notion of "duty" and its various correlates--sympathy, fellow-feeling, and altruistic action--seemed self-evidently disadvantageous to the self. Such sentiments appeared to impede the powers of self-preservation, leaving individuals less fit to survive. If natural selection assumed the struggle of evolutionary agents against one another, the presence of social sentiments seemed to present a point of conceptual collapse within that system itself. As Darwin explained in *The Descent of Man*:

> It is extremely doubtful whether the offspring of the more sympathetic and benevolent parents, or of those which were the most faithful to their comrades, would be reared in greater number than the children of selfish and treacherous parents of the same tribe. He who was ready to sacrifice his life, as many a savage has been, rather than betray his comrades, would often leave no offspring to inherit his noble nature. The bravest men, who were always willing to come to the front in war, and who freely risked their lives for theirs, would on an average perish in larger number than other men. (155)

Over time, nature should select superior progeny--those that could compete more effectively for food and other necessities. Self-abnegating actions appeared as the prerogative of evolutionary losers, since the rules of the game stipulated the sole requirements of self-preservation. Compounding this issue was the fact that self-interested individuals tended to produce more offspring ("would be reared in greater

number"), in contrast to those that selflessly set limits to their reproductive interests. If, as in the example of the hive bees, a queen was compelled to kill her "most fertile daughters," this would work to leave her lineage less likely to proliferate. Other-regarding traits would be eliminated as those toward rapaciousness, selfish striving, and aggression expanded exponentially.

If Paley and others observed the moral meanings innate in creation, then, Darwin encountered enormous trouble translating those meanings into secular terms. Individuals and individualistic striving stood at the center of nature's selective principles, so that there could be no permanent place for fellow-feeling in the world. "The struggle," Darwin wrote in *The Origin of Species*, "almost invariably will be most severe between the individuals of the same species" (83). In this view, similar sorts of organisms saw the greatest degree of competition. Darwin explains earlier in the text, "[a]s more individuals are produced than can possibly survive, there must in every case be a struggle for existence, either one individual with one another of the same species, or with the individuals of distinct species, or with the physical conditions of life" (79). Working from Malthusian principles of scarcity and accumulation, he notes that a given population will always outstrip the resources and space available for its survival. Yet, this truth is expressed entirely in individualistic terms, articulated around the surfeit of "individuals" and the resulting "struggle for existence" between them. Indeed, the rivalries between autonomous agents in *The Origin of Species* is reiterated in Darwin's theory of sexual selection, the variant form of the selection process presented next in *The Descent of Man*. Sexual selection could transpire in male rivalries for female partners, or in patterns of female choice for their male counterparts. But in both cases, Darwin defined biological

conflict as internal to groups, in the struggle between conspecifics. Just as the theory of natural selection addressed the prerogatives of particular "individuals," the theory of sexual selection attended to the antagonisms between potential partners--a state of affairs that left little room for sociable behaviors.

A solution to this impasse, however, would take shape in Darwin's interest in the cooperative aspects of the selection process. While he routinely recognized the individualistic tendencies in nature, he turned more and more to the outcomes of organic interaction.[60] "When we confine our attention to any one form," Darwin writes in *The Descent of Man*, "we are deprived of the weighty arguments derived from the nature of the affinities which connect together whole groups of organisms—their geographical distribution in past and present times, and their geological succession" (18). In *The Descent of Man*, patterns of personal experience find their complement in the history of social relationships. Evolutionary mechanisms cannot carry meaning at the level of autonomous agents alone, Darwin argued; scientists should also attend to the "affinities" that tie communities together over many generations. He elaborates later upon the "social instincts," specifically. "These instincts," he writes, "are not extended to all the individuals of the species, but only to those of the same community. As they are highly beneficial to the species, they have in all probability been acquired through natural selection" (391). Nature has selected traits that allow groups to consolidate their interests together, so as to guarantee their integrity in the face of external threats.

The exigence of this approach would become clear in accounting for one class of phenomena that had baffled Darwin for a large part of his career: the repeated appearance of sterile individuals in nature. As he explained in *The Origin of Species*, "[o]n the theory

of natural selection, the case [of sterile organisms] is especially important, inasmuch as the sterility [...] could not possibly be of any advantage to them, and therefore could not have been acquired by the continued preservation of successive profitable degrees of sterility" (298). Sterile members acted altruistically for the communal good, even and especially though they remained incapable of producing progeny of their own. Because neuters were unfettered from the reproductive process, they could invest themselves more freely in the welfare of others. As Darwin saw, these individuals remained impervious to the terms of both natural and sexual selection. Sterile castes not only refrained from reproduction (as in the theory of sexual selection), but also the imperatives of selfish striving (as in the theory of natural selection). Still, extraordinary examples of sterile members manifested among social species. What, then, were the selective factors that encouraged sterility?

Darwin arrived at a range of explanations for the production of neuters in both *The Origin of Species* and *The Descent of Man*, many pertaining to nature's efforts to impose limits on inter-breeding and self-fertilization.[61] But his most compelling claims centered on the fact that they could be preserved only through a more roundabout process of selection, one which was consistent with, but ultimately distinct from, individualistic models of organic change. In *The Origin of Species,* Darwin had posited precisely this sort of explanation, though it would come to inflect his ideas increasingly in subsequent years. He writes:

> How the workers have been rendered sterile is a difficulty: but not much greater than that of another striking modification of structure; for it can be shown that some insects and other articulate animals in a state of nature occasionally become sterile; and if such insects had been social, and it had been profitable to the community that a number should have been annually born capable of work, but incapable of procreation, I can see no very great difficulty in this being effected

> by natural selection. (290)

Although anomalous in the study of evolution, sterile individuals can still be situated within a larger continuum of organic "modification[s]." These individuals were chosen by nature precisely because of the unremunerated aid that they extended to the community--not in spite of it. In this sense, the physiological "profit" of sterile individuals was irreducible to "procreation" as such. Sterile castes actually added to the total reproductive potential of the aggregate, albeit by more mediated and circuitous channels. In this sense, procreative power was uncoupled from the bodies of particular agents per se. Instead, that power inhered in more diffusive forms of influence within the larger community. The selective process preserved those traits that appeared "advantageous to the community" as well as those that helped individuals.

Darwin's account of sterility impinged upon other observations on the evolution of social sentiments more generally in *The Descent of Man*. He did allow that communal impulses could conceivably come about through Lamarckian laws of use and disuse (e.g., through the repeated force of habitual exercise). But turning to the evolution of neuter individuals, he emphasizes the causal forces of natural selection:

> But the greater number of the more complex instincts appear to have been gained [...] through the natural selection of variations of simpler instinctive actions. We can, I think, come to no other conclusion with respect to the origin of the more complex instincts, when we reflect on the marvelous instincts of sterile worker-ants and bees, which leave no offspring to inherit the effects of experience and of modified habits. (88)

For Darwin, mental and moral instincts derive from the same sorts of processes that define evolution as a whole. Random variations are always appearing in nature, only a select few of which are actually useful; those that are most advantageous are chosen to be inherited in the future. Neuter agents stand as a case in point. (In fact, Darwin declared

that his explanation of neuter castes captured his difference from Lamarck.) However happenstance their initial appearance in nature, over time their tendencies were preserved by virtue of the benefit that they gave to others in the group.[62] No longer an aporia in the overall logic of Darwin's theory, "the marvelous instincts of sterile [insects]" appear as its most exemplary proof.

From his earliest explorations of friendship and sympathy, then, Darwin derived a comprehensive account of the social sentiments. Acts of altruism and self-abnegation actually added to the greater good of the community, and, accordingly, were selected to survive. And since such actions allowed for the well-being of one's close kin, the prerogatives of the self were also realized in this manner. Self-interest was not served simply by producing progeny of one's own; it was also expressed in the offspring of near relations. In this sense, tendencies toward "friendship" and altruistic attachment signified at once within the progress of the social whole and in the position of individuals that failed to extend their independent lineages.

It may seem a far remove from Darwin's developing moral philosophy to Charles Dickens's novels of the 1840s; but my point is to say precisely how these two authors articulated their claims within a shared constellation of ideas at mid-century, so as to create conceptual affinities even in the absence of explicit authorial intention. As Ruth Yeazell has argued, "like Darwin, the Victorian marriage plot withholds or forestalls sexual resolution in order to emphasize the selection process."[63] Yeazell notes the ways in which aesthetic assumptions became bound up ineluctably with an emerging epistemology of science at mid-century. She attends in particular to the competitive strivings between potential partners in the mid-Victorian novel; in keeping with the

theory of sexual selection, Yeazell notes, female figures alternately mediate and are mediated by the desires of their male suitors.

To be sure, Dickens's plots, like those of earlier novelists such as Jane Austen, deliberately defer sexual completion in ways which call attention to the process of selection. But this tendency towards "withhold[ing]" assumes somewhat different forms and has notably different effects in Dickens's multi-plot novels. Rather than turning attention to the figures most immediately involved in the process of sexual selection (as in Austen), Dickens routinely attends to the role of the larger group--an emphasis that is nowhere more apparent than in the function of the bachelors, spinsters, and other marginal members that populate his fiction. Like Florence Dombey, these characters are "base coin" (8) in the sense that they signify outside the prerogatives of the traditional marriage plot, with its emphasis upon the reproduction of patriarchal family lines. But though they fail to signify within the terms of procreative sexuality, these figures function within the larger process of selection in the community at large. The nature of that selective process, and its implication in Darwin's developing ideas of fellow-feeling and sympathy, will form my central concerns in what follows.

II. "One Common Fountain": The Evolution of Community in *Dombey and Son*

Charles Dickens wrote widely upon the themes of inheritance, identity, and parturition. But *Dombey and Son* focused those themes in uniquely innovative ways, working to refigure familiar problems about the legacies of the past and their power to impress the present. Whereas works such as *Oliver Twist* (1838), *David Copperfield* (1850), and *Great Expectations* (1861) would advance around the hero's quest for family

and biological origins, *Dombey and Son* marks a curious conceptual inversion: instead, it dramatizes the desire to inherit itself. Here, the hero's overmastering impulse is quite simply to produce another "perfect Dombey," a son and heir to impart his "stock" in the eponymous family firm (53). In doing so, however, Dombey consistently conflates the meanings of House and home; his family functions as a business identified solely with the so-called House of Dombey. Far from an alternative to the marketplace, Dombey manor merely reflects the same, constitutive habits of competition, accumulation, and rational self-regard. As the story takes shape, *Dombey and Son* reveals the "usual return" of paternal pride (309), showing how the desire to advance the Dombey dynasty at once organizes and ultimately undermines the law of the father.

"Pride" is, notoriously, the defining term in the novel, the central concept around which Dickens sought to fix the father's fate. Yet, the term itself finds focus in several separate registers as the plot proceeds. It appears both as a byword for the Dombeyan ethos and, by extension, as a metonymy for the most encompassing ills facing Britain in the 1840s: those tendencies towards avariciousness and selfish striving that Dickens saw suffusing the social landscape. In his excessive egoism, Dombey collapses the desire for production (the accumulation of property) into the desire for reproduction (the propagation of progeny). Pride converts filial affection into the totalizing terms of financial exchange, so that formerly personal attachments are formalized into the rigid, reifying logic of an economic contract. This stands as the greatest symbolic investiture of capital--the ultimate incursion of commerce into the regions of hearth and home, heralding nothing less than the apotheosis of family as such.

While working to disclose this state of affairs, however, *Dombey and Son*'s solution is not so much to reject the materiality of the marketplace as it is to reformulate the terms of family itself. "Family" comes to connote a richer range of connections for Dombey's kin and kind. It includes an array of adoptive attachments which, while working within the constraints of the cash-nexus, are released from the crass, transactional tendencies that typify it as such. We see this tendency take shape specifically in a series of surrogate bonds between adoptive brothers, sisters, parents, and children as the plot proceeds. Far from repudiating the powers of commerce—or, much the same, retreating into a domestic domain purified from its putative other—the novel converts this fact into the family's figural reconstitution, in the dénouement, as a company of "intimate friend[s]" (260). These attachments translate the terms of rational self-interest into those of duty, selflessness, and self-abnegation to the community as a whole.

In this manner, the text transforms its informal friendships into actual family ties, divulging the common organic origins of our shared humanity. We see this tendency take shape specifically in the novel's marginal, unmarried men—wayward figures who work to show how forms of sexual failure could actually promote potent organic relations. The story concentrates these relationships around the Midshipman's supply shop and the two "longstanding friends," Sol Gills and Ned Cuttle, who oversee its affairs. Moving from the demise of Dombey's House to the Midshipman's final success, *Dombey and Son* suggests just how unproductive impulses—the particular forms of financial and sexual sacrifice bound up in its bachelors--benefit the self by benefiting those around oneself. Disrespecting the Dombeyean ethos of (re)production, the story sanctions those

sentiments of fellow-feeling, sympathy, and self-sacrifice which were teetering towards inconsequentiality in the hungry 1840s. Far from an antithesis to organic growth, *Dombey and Son*'s bachelors appear absolutely central to it.

As it traces the paradoxical potency of its bachelors, the novel builds up key connections with Darwin's own thinking in the 1840s and thereafter. For both Dickens and Darwin posed a single social problem: given the apparent advantages of selfish striving, selfless sentiments seemed to leave individuals at a loss in the larger struggle for life. Simply put, acts of unreturned aid appeared to render individuals less likely to survive and to produce progeny of their own. The imperatives of "competition, competition" (in Gills's words) should increase over time (52), while those towards cooperation and community became increasingly scarce. What factors, then, could account for the curious persistence of fellow-feeling? In other words, why would self-abnegating actions be selected to survive when more competitive, self-regarding alternatives also appeared in nature? In answering these questions, Dickens and Darwin plotted parallel narratives of group selection. Like "those who study physical science," with whom Dickens's narrator aligns himself (700), *Dombey and Son* turns away from direct, dyadic models of inheritance and parturition, suggesting instead how selfless individuals vitalized the community in ways which never reflected back upon the isolated strictures of the self. Somewhat counterintuitively, the very refusal of reproductive intimacies allowed their traits to be diffused throughout the social order.

Dombey and Son begins in an image of closure and containment. Namely, the birth of a son and heir, Paul Dombey, Jr., heralds the apotheosis of the Dombey line. “The company will be in name and in shape Dombey and Son, Dom-bey and Son,”

Dombey's sister, Mrs. Chick explains. Little Paul's presence means that the company can continue as a perfect partnership between Dombey and his double; the hyphenated noun points precisely to the absence of interrupting influences between father and child, affirming the endless vitality of the family firm. In fact, what is most notable about the infant Paul is the absence of anything noteworthy at all. He seems simply a "perfect Dombey," the facsimile of an established archetype (16). Paradoxically, the progress of the family follows from the reification of "Dombey and Son" itself as a transcendent term, so that the title can become a "perfect," "unbending," and above all static signifier of the ideal Dombeyean type (16; 44). To be a Dombey, we learn, is to embody every Dombey that came before. "Dombey had risen, like his father before him, from Son to Dombey," as the narrator notes. In this sense, Paul, Jr.'s birth does not imply progress so much as its negation, no change other than the essential erasure of teleology as such, so as to suggest the ultimate symbolic resolution of the Dombey family drama.

The keynote paragraph preserves the structure of these sentiments, while working at the same time to expose them to forms of ironic critique. The narrator observes:

> Dombey was about eight-and-forty years of age. Son about eight-and-forty minutes. Dombey was rather bald, rather red, and though a handsome well-made man, too stern and pompous in appearance to be prepossessing. Son was very bald, and very red, and though (of course) an undeniably fine infant, somewhat crushed and spotty in his general effect, as well. (11)

Little Paul presents a disposition and countenance in keeping with his paternal prototype. The paragraph conveys this point stylistically through an accumulation of repeated, punctual phrasings, which work at once to minimize the narrator's subjectivity and to dramatize the very duplications that he describes. Little Paul appears as a miniature model of his "well-made" father (11). But behind this descriptive narrative syntax stand

suggestions of distance and dissimilarity, as the narrator turns to the son's "crushed and spotty" shape--a state of sickliness disproportionate to Dombey's own "stern," spotless appearance. Indeed, the scene is steeped throughout in images of violent opposition. Dombey is "a tree that was to come down in good time"; he "toast[s]" his son upon the fireplace; and most alarmingly of all, little Paul, "with his little fists curled up and clenched, seemed, in his feeble way, to be squaring at existence." What defines the son is precisely his desire for passionate self-negation. The differences between father and son are emphasized in the final, parenthetical "of course," which points to what is unexpected and, as it were, "off course" (11). "The two," as the narrator concludes, "[s]o very alike, and yet so monstrously contrasted" (12).

But if Dombey is defined by his paternal pride, then he is also identified with what his pride precludes: the possibility of other, less selfish social relationships. The narrator explains:

> An indescribable distrust of anybody stepping in between himself and his son; a haughty dread of having any rival or partner in the boy's respect and deference; a sharp misgiving, recently acquired, that he was not infallible in his power of bending and binding human wills. In all his life, he had never made a friend. His cold and distant nature had neither sought one, nor found one. (61)

Opposition and struggle exist everywhere for Dombey, so that “friend[ship]” and “rival[ry]” become conceptually equivalent. Each evokes a kind of dangerous proximity: other people only jeopardize Dombey's "parental scheme," which is premised purely upon an omnipotent fantasy of "infallibil[ity]." Its master terms are "respect and deference," "bending and binding." Within this state of affairs, the wish for friendship marks merely the interruption of patriarchy—an unwelcome distraction, a desire defined

above all by its wayward relationship to filial and financial success. Friends threaten only to disrupt the dyadic integrity of the two Paul Dombeys.

As the plots take shape, *Dombey and Son* deliberates upon Dombey's appraisal of friendship, at once observing its accuracy and offering another, vastly different framework for interpretation. In the polarizing opposition of Dombey's estate (on the one hand) and Cuttle's and Gills's estates (on the other hand), the novel inquires into the powers of family pride and "intimate friend[ship]" as alternative ways of advancing one's legacy (260). The story does so specifically through the theme of inheritance, as it juxtaposes Dombey's desire to convey his family fortune to little Paul, his "son and heir," and Gills's wish to leave his meager "fragment" to Walter Gay. In the eventual union of Florence Dombey and Walter Gay, Gills's inheritance will win out, safeguarding the estate of the couple—and, accordingly, ensuring the success of a re-constituted Dombey lineage. But as Gills and Cuttle become invested as fathers for the newly-wedded pair, the boundary between "friend[s]" and family will dissolve, so as to show instead the intricate interrelationship of the community at large.

In its attention to the problems posed by inheritance and generation, *Dombey and Son* suggests the same sort of struggle for reproduction that Darwin's work would explore in ensuing years. But what links Dombey, Gills, and Cuttle is not the fact that they compete against one another to preserve their estates, but rather that they are all increasingly constituted as sexual *failures*. Most notably, little Paul's early death disrupts the stability of Dombey's family, so as to shift the story's focus from Dombey's successful paternity to the ensuing evacuation of his household. But other examples are also pervasive. Dombey's second marriage to Edith, the new Mrs. Dombey, does not result in

a male child, either. Much to the contrary, it instigates another rivalry between Dombey and John Carker the Manager, which ends in an absence of children altogether. Similarly, Dombey's hapless acquaintance in the marriage market at Leamington, Joe Bagstock, fails to marry Louisa Tox; but Bagstock's erstwhile overtures also prevent her from marrying Mr. Dombey. A grotesque caricature of pride, Bagstock is left alone after attempting to court Edith's mother, Cleopatra Skewton. Along similar lines, the sharp-toothed Carker--by far the novel's most overtly sexualized character--must pay with his life for courting Edith, and is left likewise without any legacy whatsoever.[64] In all of these instances, *Dombey and Son* refuses the trajectory towards sexual success in order to emphasize the fact of its repeated breakdown--those innumerable individuals and species which, as Darwin would also emphasize, were unable to preserve themselves through the production of progeny.

The question that *Dombey and Son* raises, then, is not so much who will win out in the struggle for reproduction, but rather how failure might be incorporated productively into communal processes of regeneration. In this light, the Midshipman's parlor provides a crucial counterpoint to Dombey's domestic ideology. For Gills's shop stands as a desirable domestic domain—a site of friendship, sympathy, and selflessness—precisely insofar as it is also an emphatic failure. After her expulsion from home, for example, Florence finds it "[as] convenient and orderly, if not as handsome, as in the terrible dream she had once called Home." The shop's careworn character appears as the very basis for Florence's interest in it, marking its identity at the margins of the marketplace and the imperatives of personal profit. But this fact also augurs the Midshipman's impending collapse; as Gills explains to his nephew, Walter Gay:

> You see, Walter," he said, "in truth this business is merely a habit with me [...]. But competition, competition—new invention, new invention—alteration, alteration—the world's gone past me. I hardly know where I am myself; much less where my customers are." (52)

Given the imperatives towards "competition, competition" in the 1840s, Gills's sympathies seem increasingly retrograde. "[I have] fallen behind the time, and am too old to catch it again," he explains (53). In the overall struggle for life, selfish striving has prevailed over selflessness—a tendency that leaves little room for individuals like Gills. As the passage proceeds, his self-denying disposition becomes all too literal. "I am only the ghost of this business—its substance vanished long ago; and when I die, its ghost will be laid," he explains to Walter (53). For the ghostly "Old Sol," selflessness simply impedes more substantial gratifications; in his disavowal of material matters, Gills is deemed devoid of "substance" as such.

Just as Gills has declined the compulsions of "competition, competition," he has selflessly renounced reproduction and a family of his own in order to raise his nephew. A resolutely "old Sol" (47) whose resources "vanished long ago," his name serves also as a reminder of his solitary status as a single man throughout the text. He remains the "sole master and proprietor of that Midshipman" (46). In this sense, the text juxtaposes Dombey's son (who appears as a sign of his family's future) and Walter Gay (who signifies his uncle's status as an artifact of the past). Walter reflects:

> I feel you ought to have, sitting here and pouring out the tea instead of me, a nice little dumpling of a wife, you know--a comfortable, capital, cosey old lady, who was just a match for you, and knew how to manage you, and keep you in good heart. Here I am, as loving a nephew as ever was (I am sure I ought to be!) but I am only a nephew, and I can't be such a companion to you when you're low and out of sorts as she would have made herself, years ago, though I'm sure I'd give any money if I could cheer you up. (133)

As in Darwin's discussion of neuter insects in *The Descent of Man*, the passage emphasizes both the material and sexual sacrifices bound up in Gills's guardianship. In caring for Walter, a less immediate relation, Gills has given up a "capital" wife, a companion to “manage” his interests rather than reduce them. Seen in this context, "making" assumes both transitive and implicitly intransitive properties. It indicates the "old lady['s]" company and what that company itself would have produced "years ago": an actual son and heir, a "partner" along the lines of little Paul Dombey. Simply put, his nephew precludes the possibility of a successful family of his own.

As it poses the problem of inheritance in this manner, the novel raises a human question much larger than the immediate material one. Is selfishness or abstemious self-sacrifice better suited to the aims of inheritance? In other words, why should Gill's legacy persist while Dombey's wanes away? In answering these concerns, the novel will show how Cuttle and Gills invest themselves in those around them, whereas Dombey and other self-regarding individuals end either in isolation or outright death. This means that Gills's close relation, Walter Gay, will work to further Gills's family lineage, even though Gills and Cuttle themselves forswear the trajectory towards marriage itself. Their selfless sentiments will persist through the affairs of Walter—who, accordingly, will also purify the Dombey lineage from its self-seeking disposition. If Walter and Florence's marriage marks the achieved success of the Dombey line, then it is a line in which the self-sacrificing legacies of Gills and Cuttle—themselves enshrined as "golden characters" in the end—will win out (943).

We see the identity of Gills, Cuttle, and Walter expressed explicitly in the tale of Dick Whittington, a child who rose from poverty to marry his master's daughter and to

become London's mayor. The two men commence the Whittington narrative when Walter finds employment as a clerk in Dombey's House, although they return routinely to it afterwards. In celebration of the event, Cuttle, Gills, and Walter drink a collective toast. "We'll finish the bottle, to the House, Ned—Walter's House," says Gills. "Why it may be his House one of these days, in part. Who knows? Sir Richard Whittington married his master's daughter" (142). Here, Walter assumes the status of a romantic hero who works up from obscure origins to achieve social and romantic success. But whereas Whittington had struggled in heroic isolation to achieve his aims, Walter's progress will be predicated upon the unreturned assistance of others. In fact, the tale itself serves as an inspiration for Gills's and Cuttle's support, so as to invert its individualistic emphasis in the very telling of it. Cuttle can hardly contain himself after learning of little Paul's death, for example, and informs John Carker the Manager, "Pass the word, and there's another ready for you,' quoth the Captain. 'Nevy of a scientific uncle! Nevy of Sol Gills! Wal'r! Wal'r, as is already in your business!" (178). Walter may be uneasy "when the Captain and Uncle Sol talked about Richard Whittington and master's daughters," but this is no impediment to his guardians' convictions in the story. For their parts, Gills and Cuttle ritualistically tell and retell the tale as they bring about its vicarious success.[65] In this manner, the Whittingtonian narrative does not find fulfillment in the solitary feats of a single protagonist—in fact, the shipwrecked Walter is displaced from the majority of the plot--but instead in the domestic dealings of Cuttle and Gills, so that *Dombey and Son* distinguishes and displaces prior fictional perspectives from its own confederate viewpoints.

The inaugural incident in the progress of the plot proceeds from Gills's debt to a former family creditor. An "old bond" between himself and his departed brother, Walter's father (142), the debt reflects both Gills's good will and its essential hazards to the self. "It came of helping a man that's dead now," Cuttle explains, "and that's cost my friend Gills many a hundred pound already" (152). Just as Gills has given up the chance for a son in order to raise another man's child, he has also assumed that man's "cost[s]." I've paid a good deal of it, Ned," he explains. "But the times are so bad with me that I can't do more just now" (142). In this state of affairs, there can be no stable foundation for Gills to build up his hopes for the future. The last "fragment" of his inheritance threatens to fall fatally into the past, succumbing to the pitfalls of an unfit family line.

As it resolves the problem of the debt, the narrative will work to convert Gills's "old bond" into a shared source of prosperity. By providing a spur for community and cooperation, patterns of loss are recuperated and re-conceived as a basis for positive social relations in the future. Accordingly, Gills's isolation is lessened as the weight of the debt continues to mount, beginning when Walter and Cuttle solicit Dombey himself for a loan. "People," Dombey declares, "had better be content with their own obligations and differences, and not increase them by engaging for other men" (153). For Dombey, the pleas of Cuttle and Walter are not only misguided but morally suspect, suggesting an absence of autonomy and the proprieties of masculine social "difference." Indeed, Dombey sees the event only as an opportunity to display dominance over others, allowing his son to see "the power of money, and all it can do" (152). After framing their request in this fashion, he delegates the final decision to little Paul:

> "If you had money now," said Mr. Dombey; "as much money as young Gay has talked about; what would you do?"

> "Give it to his old uncle," returned Paul.
> "Lend it to his old uncle, eh?' retorted Mr. Dombey. (153)

The joke, here, resides in the fact that Dombey cannot conceive of "giving" as anything other than as a euphemism for personal gain; but as the jest wears thin, the father's refusals of sympathy become palpable. "Young Gay comes all this way to beg for money," Dombey says, "and you, who are so grand and great, having got it, are going to let him have it, as a great favor and obligation" (153). When little Paul proposes again to give the money freely, he not only reveals himself to be an imperfect Dombey, but also aligns himself with another family altogether. The gift turns an "old bond" between brothers into a new one, substituting Gills's prior obligation into the new brotherly "bond" between little Paul and Walter. For his part, Dombey tries to convert the gift back into an economy of obligation ("'you will consider that it is done,' he repeated, by master Paul" (154)). But the statement functions not so much to transform the gift as to disassociate himself from it, establishing distance from a disenfranchising event.

As it turns out, then, the very scene which was to make little Paul "start to be Dombey and Son" designates him instead as a spiritual son of the Midshipman. From this point forward, Walter and little Paul will be remembered as friends and actual fraternal relations. Through the agency of the gift, older obligations become a foundation for new familial attachments. As the plot proceeds, Walter's brotherly bond with Paul, Jr. is in turn translated into the sibling relationship between Walter and Florence, and then finally into the sexually fertile marriage of husband and wife. This fact is reflected in Paul Jr.'s dying words to Florence. As she informs Walter, "He liked you very much and said before he died that he was fond of you, and said, "remember Walter!" And if you'll be a brother to me, Walter, now that he is gone and I have none on earth, I'll be your sister all

my life and think of you like one wherever we may be" (188). In this symbolic extension of family, the story collapses its initial distinction between sexually stagnant bachelors and the Dombeyean ideal of direct descent. Family is re-fashioned through informal bonds of fellow-feeling, blurring the boundary between lineages of blood and the more fungible, plastic patterns of relationship that pervade the plot as a whole. Thus, the problem of "base" bonds--their unrenumerative, purely fictional nature at the outset of the plot—re-appears as a principle of growing organic interconnection, so as to provide a foundation both for family and for the formal order of Dickens's own fictional enterprise.

In all of these ways, *Dombey and Son* dissolves the apparent polarities of family and "intimate friend[s]" (260), displacing Dombey's ideal of direct descent with the intricate relations within the community at large. Indeed, if Gills and Cuttle lack a single "son and heir," then this absence allows an array of surrogate relations to take shape instead—including, most notably, Walter, Florence Dombey, and Rob the Grinder, all of whom inhabit the Midshipman's shop at various points in the plot. Released from a strict hierarchy of domestic relationships, these children represent a range of more plastic and fungible interpersonal positions for family and its fortunes. For example, Florence is characterized variously as a "niece" to Cuttle, Cuttle's "ward," and an object of Gills's own "parental reverence" (741; 740; 242). Gills and Cuttle are identified as "brothers"; at the same time, Cuttle acts as a father to Gills's nephew, Walter, who is "almost a son" to him (312; 265). And most notably of all, Florence and Walter become bonded as siblings, and remain "brother and sister" until their marriage makes this fantasized family real (547). When the two are wedded together, there is "no better father than Captain Cuttle"

(872), a fact that formalizes the new bond between Cuttle, Gills, Florence, and Walter and installs the latter two as a fresh foundation for the Dombey family lineage.

Not all of *Dombey and Son*'s surrogate sons and daughters, however, are identified with Cuttle and Gills. As the plot proceeds, the struggle for family finds focus in the struggle for *adoptive* bonds, so as to intensify further the relations of fililation and affiliation. We see this take shape specifically as the sharp-toothed Carker becomes a father to that "bad son," Rob the Grinder (333). In the battle between Cuttle and Carker for the boy's affections, the story extends its initial interest in inheritance and generation, now expressed explicitly in the tension between two mock-patriarchs. Just as Darwin would reveal competitive patterns between opposed groups in nature, *Dombey and Son* suggests a similar sort of social conflict. Ultimately, Carker's rapacious self-regard unsettles the potential for further forms of relationship, leading up to his solitary demise, whereas his counterpart's more cooperative sentiments turn out to permit the shared survival of the group.

Part of what makes Rob the Grinder such a singular figure in the plot is precisely the fact that he stands as a distinctive double for the other children. As the oldest son of Polly Tootles, little Paul's wet-nurse, Rob and Paul are connected by the "one common fountain" of the mother's milk (32). Mrs. Chick's friend, Louisa Tox explains, “[Polly] naturally must be interested in her young charge, and must consider it a privilege to see a little cherub closely connected with the superior classes, gradually unfolding itself from day to day at one common fountain” (32). The mother's hired breast becomes a metonymy for shared organic origins more broadly--a point of connection which is both

necessary for Tootles's labors and also necessarily disavowed by Dombey. For the "one common fountain" from which the two boys appear actually threatens to undermine any absolute line of demarcation between natural and artificial attachments as such. Dombey's anxieties appear in the form of a changeling fantasy:

> His thoughts were tending to one center: that a great temptation was being placed in this woman's way. Her infant was a boy, too. Now would it be possible for her to change them? Though he dismissed the idea as romantic and unlikely--though possible, there was no denying--he could not help pursuing it [..]. Whether a man so situated would be able to pluck away the result of so many years of usage, confidence, and belief from the impostor, and endow a stranger with it? (31)

Dombey considers the perverse possibility that there can be no firm basis for differentiating kin from kind, no boundary between family and its others. Dissolving the difference between sons and strangers, "perfect Dombey[s]" and impostor ones, the real basis for family turns out to be "belief" in the idea of family itself (16; 31). This realization marks Dombey as a storyteller of sorts; but if Cuttle and Gills seek to make their fictions of family real, bringing about its eventual success, then Dombey steadfastly refuses to acknowledge the identity of his "belief" as such.

In this sense, Rob represents a threat to the stable identity of the Dombey home, highlighting how the children of others might be appropriated as actual family ties. Like the shipwrecked Walter, who he displaces for a large part of the plot, Rob suggests the sort of creative interconnections that the novel itself seeks to enshrine. But Rob does so in a different way than Walter; as a principle of prodigality in the plot, Rob calls attention to the fictive nature of families by virtue of his repeated disenfranchisement from them. His violent treatment at the Grinder's charity school results in his disaffection from the Tootles clan; displaced from home, Rob learns precisely how to evade education and self-help, and instead cultivates a variety of anti-social sentiments. An alien presence at home,

Rob is said to have gone "on the wrong track," having jumped his family line in order to circulate throughout the social order at large. "'You could hardly be off hearing of it somehow," his father says, "and it's better I should out and say my boy's gone rather wrong." (309). In wandering away from the apple-faced Tootles family, Rob has become errant in another sense, so that Robert Tootles is replaced by the changeling child Rob the Grinder.

Whereas Dickens had intended initially to make Walter "go bad, by degrees," he instead chose to shift this theme onto the more minor presence of Rob, who could capture the relative, relational nature of human moralities while still safeguarding the purity of his heroic counterpoint.[66] Rob is pitted against two different surrogate situations: an alliance with a bad father, Carker, and one with a good father, Cuttle, upon whom he has been commanded to spy. When he arrives in the Midshipman's shop, Cuttle accepts him unquestioningly. "The Captain did not," the narrator notes, "neglect his own improvement, or the mental culture of Rob the Grinder" (590). Earnestly devoted to the "mental culture" of his charge, Cuttle's sole concern is to lift up the child who substitutes for the lost Walter. In this sense, the two represent another version of the Walter-Gills relationship--particularly since Cuttle acts in Gills's place when his friend latter leaves England in search of the shipwrecked Walter. But Cuttle's efforts remain ineffectual for Rob, who has been schooled precisely in feigning education. "Yawn[ing] and nodd[ing]" throughout, Rob merely "ma[kes] a mighty show of being edified when the Captain ceased to read" (591). While working to make Rob part of the confederate community of the Midshipman's shop, in the end Cuttle remains unable to incorporate him. When Rob bolts suddenly from the shop, "sniveling and sobbing louder, as if he were cut to the heart

by old associations," he secretly rejoices at having duped his erstwhile master, who is left resolutely alone. "Now, old Sol Gills, Walter, and Heart's Delight were lost to him indeed, and now Mr. Carker deceived and jeered him cruelly. They were all represented in the false Rob" (596).

In the figure of Rob, *Dombey and Son* reflects more broadly upon the conditional nature of moral impulses—their constitution in the exigencies of lived experience and the pressure of environmental needs. The theme was also Darwin's, who would work to explain the evolution of social sentiments in light of the overall struggle for existence. Dickens's narrator makes this latent connection clear in an extended excursus:

> Was Mr. Dombey's master-vice, that ruled him so inexorably, an unnatural characteristic? It might be worthwhile, sometimes, to inquire what Nature is and how men work to change her and whether in the enforced distortions so produced, it is not natural to be unnatural. [...] Vainly attempt to think of any simple plant or flower or wholesome weed that, set in this foetid bed, could have its natural growth or put its little leaves forth to the sun as god designed it." (700-1)

In the thought-experiment presented to the reader, "Nature" is stripped of any transcendent signification, so that it becomes a synonym for its ostensible opposite, the "unnatural characteristic[s]" of immoral men. Simply put, social sentiments are what men make of them, so that virtue and vice are divorced from pre-established patterns of moral meaning. Instead, they are "natural growth[s]" like any other, arising out of the same principles that govern the organic world as a whole. The analogical linkage between human moralities and plant life is central, here: it serves to connect human "nature" and the wider workings of the physical cosmos.

Through the offices of the unnamed narrator, then, the text stands back to interpret itself in light of a natural history of moralities. In fact, the narrator's thematic

and conceptual concerns, here, become a basis for theorizing the multiple perspectives of popular fiction itself. As the narrator observes in the same passage:

> Oh, for a good spirit who would take the house-tops off, with a more potent and benignant hand than the lame demon in the tale, and show a Christian people what dark shapes issue from amidst their homes, to swell the retinue of the Destroying Angel as he moves forth among them! For only one night's view of the pale phantoms rising from the scenes of our too-long neglect; and from the thick and sullen air where Vice and Fever propagate together, raining the tremendous social retributions which are ever pouring down, and ever coming thicker! Bright and blest the morning that should rise on such a night; for men, delayed no more by stumbling-blocks of their own making, [...] would then apply themselves like creatures of one common origin, owning one duty to the father of one family, and tending to one common end, to make the world a better place! (702)

The narrator positions himself as an objective observer able to divulge domestic affairs from a perspective apart from it," tak[ing] the house-tops off" to trace the etiology and effects of social ills. "Vice" follows from one's environment and the lived conditions of existence. Like the voice of Darwin's narrative, Dickens's narrator (identifying himself, here, with "those who study physical science" (700)) aspires to show how moral and social sentiments stem from external contexts. What matters more than flesh and blood—the somatic essence of a given family--is the influence of the extant environment and how communities as a whole "work to change [it]" (702). To be sure, Dickens does uphold a teleology towards moral progress; those perverse "phantoms" in the passage appear as impediments to an achieved communal condition, the transcendent truth of the providential plan in nature. But in keeping with Darwin's project, the overall aim of this enterprise is to disclose the "one common origin" and "one family" of man, the shared humanity of individuals inhabiting the pan-organic order of nature.

Within this state of affairs, to be "almost a son" or daughter is still to be a more proximate relation within the group as a whole (265). Given our common connection to

"our mighty mother" and "the father of one family," no firm line of demarcation can be made between actual, authentic offspring like little Paul and his doubles: the mock-sons Walter Gay and Rob the Grinder, both "false Dombey[s]" in their own ways, like Florence Dombey herself (702). In the movement towards Florence and Walter's marriage, the artificial attachments around the Midshipman's shop provide the grounds for a new Dombey-Gay lineage, literalizing the fictions of family that had defined the group as such. In this way, while the story continues to insist upon the fragility of family—its artificial bases in the "belief" in family itself—it also emphasizes the more positive implications of this fact as it "tends to one common end" in the finale (702), articulating a set of collective connections across the social order.

The text bears out this tendency in several specific ways. For example, the fallen woman Alice Marwood is discovered to be Dombey's niece from his first marriage, just as Old Mrs. Brown is shown to be Dombey's sister in law. These connections cut across any absolute, hierarchal division between social classes to reveal the intricate relationships that structure the community as a whole. But no character more fully expresses this theme than Florence Dombey herself. Defined as "base coin" in the Dombey household (13), the term has several special meanings for her as the plot proceeds. First and foremost, Florence is the female product of a patriarchal household. To be Dombey's daughter is to signify simply as a "bad Boy," to be deemed devoid of value except in relation to an archetypal male ideal (13). In this sense, she represents the perverse presence of women within the homosocial order of Dombey and Son. But the very pathology of the father's aversion suggests a second reason for her devaluation: the prospect of an adulterated genealogical lineage. Florence is an artificial forgery, the

embodiment of a debased blood line. We see this in several scornful comments upon her lack of resemblance to Dombey—for example, when Mrs. Chick laments, "she is her mother all over again." The product of another family lineage, she threatens to dilute the Dombey "stock" altogether.[67] Florence's love for her deceased mother, Fanny; her actions on behalf of her sickly brother; and her affection for Walter, Sol Gills, and Cuttle; for Dombey, all these selfless impulses mark merely the threat of genetic dispersion, so as to challenge the essential primacy of the father and of the father's estate. Her actions threaten to diminish the Dombey line rather than building it up, broaching bonds with individuals far afield from her father's House and home.[68]

When Florence is cast out of Dombey's household in chapter forty-seven, following Edith's decisive departure, it is merely to enter the public arena in which she has always threatened to circulate.[69] In fact, Florence's expulsion from home works on several levels. In one sense, it defines Dombey as a bachelor devoid of children or a wife (so that, in the words of the narrator, "Mr. Dombey and the world are alone together" (781)). But at the same time, it also makes a new family unit of Florence and Cuttle. "Homeless and fatherless" upon her arrival, Florence is insistently identified as Cuttle's new charge (736). "The Captain was not troubled with the faintest idea of any difficulty in retaining Florence, or of any responsibility thereby incurred," the narrator notes. "If she had been a Ward in Chancery, it would have made no difference at all to Captain Cuttle" (740). The effect is to reverse the relationship between Dombey's House and the Midshipman's shop, isolating the former father while investing Cuttle and Gills as heads of an alternative family order. When Cuttle and Florence visit a neighboring shop to buy a dress, Cuttle calls attention to their new relationship: "at the word 'niece,'" the narrator

comments, "he bestowed a most significant look on Florence, accompanied with pantomime, expressive of sagacity and mystery" (741). The "pantomime" points to the artificiality of their tie, while working simultaneously to express the truth of their shared sympathy (captured in Cuttle's "most significant look"). When Cuttle confers his meager savings to her, shortly thereafter, it is not so much to quantify their relationship as to situate it outside the prerogatives of personal profit altogether. 'Put it anywheres, my lady lass, so long as you know where to find it again. It an't o' no use to *me*,' said the Captain. 'I wonder I haven't chucked it away afore now'" (742). From Paul Dombey and his ethos of (re)production, then, Florence settles in a new family of "compassion and gentleness," sympathy and self-sacrifice.

Walter's return from abroad, following immediately upon Florence's arrival, affirms her place within this re-configured family order. In fact, Cuttle calls attention to the connection between the two mock-siblings in his very refusals to inform her of his presence. "'He was older than you, my lady lass,' pursued the Captain, 'but you was like two children together, at first; warn't you?'" (738). By perversely pointing out Walter's loss, Cuttle accentuates their relationship and lays the foundation for its figural reconstitution as a romantic one. The parenthetical "at first" points at once to their initial identity as brother and sister, and to the misplaced potential for a fully sexualized relationship in adulthood. Along similar lines, after Florence rues the death of "my brother," Cuttle notes that "[he] *was* your nat'ral born friend like, warn't he Pet?" (737). The central term, "friend," functions to naturalize the adoptive attachments of the past (the two are "nat'ral born" together), while gesturing at the same time towards further intimacies in the future. When Walter does finally enter in the scene, it is to acknowledge

their former familial bond and to build up a new one out of it. He explains to her, "I have not a brother's claim. I left a child. I find a woman'" (769). But the effect is not so much to repudiate their prior relationship as it is to intensify it in light of a newer, more fully realized adult one. Florence emphasizes this point emphatically. "All I ask is, Walter, in the name of the poor child who was your sister once, that you will not struggle with yourself, and pain yourself, for my sake, now that I know all!' (768). Their new bond derives its identity in relation to their older one as "nat'ral born friend[s]," translating their initial status as mock-family relations into real relations in marriage.

In the scene of their reunion, then, Walter and Florence's fantasized family becomes codified in institutional terms, creating continuity with the past rather than an absolute rupture from it. Cuttle's own responses to the betrothal scene help to underscore this point. The narrator observes, "[Cuttle] was repeatedly heard to say in an undertone, as he looked with ineffable delight at Walter and Florence, 'Ed'ard Cuttle, my lad, you never shaped a better course in your life, than when you made that there little property over, jintly!' (772). In "ma[king] that there little property over"--giving Florence away freely, without returns to the self--his legacy is communicated to the future. But who or what Cuttle passes her on *to* remains unclear. In part because both Walter and Florence remain his surrogate children, Florence is not released from the confines of Cuttle's "family" at all. Within this phantasmic family order, the loss of "that little property," Florence, can be contained in a recuperative union to the surrogate son, and thus become a principle of continuing growth in the life of the confederate group. For Cuttle, the family lineage is intensified in the very act of giving the daughter away; the dispersion of

family, which Dombey dreads, is re-defined as a means to the increasing coherence of a new familial ideal.

Seen in this way, the charitable commitments that had hindered Cuttle and Gills, earlier—their tendency to selflessly furnish their "little property" upon others—is symbolically reconceived as a foundation for endless social returns (772). We see this theme articulated in another register when Dombey's disgraced second wife, Edith, reappears in the final chapters to speak with Florence and her newborn baby. Resigned to the life of a spinster, Edith has foresworn family and children; still, she comes to recognize the effect of her actions in the outcomes of own Florence's life. Gazing upon Florence's infant child, Edith explains, "I said that I would die and make no sign. I could have done so, and I would, if we had never met, Florence" (937). Despite disclaiming any active role in advancing the Dombey lineage ("mak[ing] a sign"), it turns out that a "sign" has taken shape after all—albeit by more roundabout routes of influence in relation to Florence, whose life she had struggled to uphold. Like Cuttle and Gills, Edith cannot claim any immediate offspring as her own; instead, she embraces a more mediated model of generation, an ideal of sympathy and self-sacrifice towards her step-daughter.

In fact, the two figures that "make a sign" most emphatically in the finale are the two figures who never marry at all, Cuttle and Gills. The narrator comments:

> And how goes the wooden Midshipman in these changed days? Why, here he still is [...] and more on the alert than ever, being newly painted from his cocked hat to his buckled shoes and up above him, in golden characters, these names shine refulgent, GILLS AND CUTTLE. (943)

As it turns out, the Gills and Cuttle are not "behind the time" after all, but profitably prescient (in light of the expanding empire's new need for nautical instruments). Just as Florence is re-fashioned from "base coin" to the "golden link" in her father's lineage (13;

224), the Midshipman moves from a site devoid of "substance" to one which is expressed in "golden characters" (53; 943). The sign signifies the new status of the two unmarried men as productive partners, having become "golden" through their very refusals of personal gain. As the narrator notes, "there is a fiction of a business in the Captain's mind which is better than any reality. [...] His delight in his own name over the door, is inexhaustible" (944). Business becomes re-constituted as a form of pleasure and play. In the same way that Cuttle's "pantomime" of family actually fosters social sympathies, the "fiction" of business makes the marketplace over in the image of friendship, cooperation, and community. Cuttle and Gills's new partnership displaces the failed family firm of Dombey and Son, promising to provide a profitable inheritance for Walter and Florence--and, through them, for the Dombey lineage itself. Just as Paul Dombey's estate dries up, Gills's former "fragment" is installed as a new, more selfless basis for the family's future.

Whereas countless social problem novels of the 1840s would make marriage between upper- and lower-class characters into a metonymy for social renewal, *Dombey and Son* presents Florence and Walter's wedding as only one in a series of newly formalized relationships in the end, in which the "golden characters" of Cuttle and Gills themselves appear prominently (943). While working within the terms and tropes of the marriage plot, *Dombey and Son* gestures beyond it to emphasize the perverse potency of its unmarried men. These other unions involve Susan Nipper and Toots, Harriet Carker and Mr. Morfin, Mrs. Macstinger and Captain Bunsby, and Dr. Feeder and Cordelia Blimber. The partnership of Gills and Cuttle becomes almost impossible to view apart from this long litany of weddings. Notably, the eponymous hero of *Alton Locke* (1850) was left likewise as a bachelor at the end of Kingsley's novel. But whereas Alton's failure

of generation signifies an unresolved problem for Kingsley, Dickens suggests how such non-reproductive relationships might vitalize the greater group, marking more prodigal but all the more prolific patterns of influence within the community at large. One also thinks, along these lines, of the Cheeryble brothers in *Nicholas Nickleby* (1839), the merchants with whom Nicholas finds employment, charity, and benevolence. Even as the final chapters celebrate the renewal of the Dombey lineage, then, they also enshrine the infertile figures of Gills and Cuttle as a new basis for organic community.

Seen in this light, the "golden characters" that re-compose Cuttle and Gills reflect the "golden characters" that constitute the novel itself, as its author struggled to arrive at a new, more tightly-focused order of narrative development. Far from merely marginal or aberrant in nature, the novel's unmarried men provide the very foundations for formal unity—figuring the intricate interrelationships between individuals and groups that typify the multiplot novel as such. From Dombey's desire for direct descent—the perfect replication of oneself in one's "issue"—Dickens's story enshrines the more wayward, seemingly sterile issues of its bachelors, who turn out to be vital to the structure of novel's nineteen serial "issue[s]." *Dombey and Son* thus suggests how non-productive impulses might provide a positive basis for the organic order of fiction, revealing the productive outcomes of personal failure and disclosing in the phenomenon of infertility the potential for unending social growth.

NOTES

[46] Darwin, Charles. *The Origin of Species.* ed. William Bynum. New York: Penguin, 2009. 105.

[47] Gould, Stephen Jay. *Ever Since Darwin: Reflections in Natural History*. New York: Norton, 1977. 12; Desmond, Adrian and Moore, James. *Darwin.* New York: Warner, 1991. 275-6.

[48] Seminal studies by scholars such as Gillian Beer and George Levine notably resist this tendency, instead emphasizing the ineluctably polyvalent nature of Darwin's writings. In Levine's words, "[g]ood cultural theory might best take sexual selection not as a simple reflex of cultural prejudice but as a fascinating commentary upon it." Levine, George. "'And If It Be a Pretty Woman All the Better'—Darwin and Sexual Selection," in *Literature, Science, Psychoanalysis, 1830-1970: Essays in Honour of Gillian Beer*. Oxford: Oxford University Press, 2003. 38. My own reading of Darwin and Dickens builds upon these approaches by showing how both deliberated upon the positive potentials for community and other collectivist sentiments in nature. The effect is to reveal a Darwin who at once reflected and refracted inherited intellectual legacies, engaging in contemporary cultural conversations in a way which led him to respond actively rather than passively to prior epistemologies. Cf. also Beer 6; Levine 1988, 13-14.

[49] Critics since have long noted to the distinctive status of the bachelor in Victorian fiction. In what he characterized famously as an "avuncular view" of *Middlemarch* (1872), U.C. Knoepflmacher saw a pervasive pattern of displacement in Eliot's novel whereby unmarried uncles were accorded a much more prominent role in families than were actual fathers. Knoepflmacher's emphasis on the "uniformly destructive" role of the bachelor has been challenged by subsequent critics—most notably, Katherine V. Snyder. But despite this fact, critics have continued to uphold Knoepflmacher's emphasis on the bachelor's antithetical relation to reproductive bonds. Departing from this tradition, I seek to show how Dickens and Darwin were working to actually dismantle the putative opposition between family and its others, so as to make expressions of sexual sterility into a new foundation for genetic legacy. Knoepflmacher, U.C. "*Middlemarch*: An Avuncular View." *Nineteenth-Century Fiction* 30 (1975): 53-81. 77. Snyder, Katherine V. *Bachelors, Manhood, and the Novel, 1850-1925*. Cambridge: Cambridge UP, 1999.

[50] Levine, George. *Darwin and the Novelists*. Cambridge: Cambridge UP, 1988. 121.

[51] *Ibid*, 124.

[52] Qtd. in Collini, Stefan. *Public Moralists*: *Political Thought and Intellectual Life in Britain, 1850-*

1930. Oxford: Clarendon Press, 1991. 68.

[53] Richards, Robert J. *Darwin and the Emergence of Evolutionary Theories of Mind and Behavior*. Chicago: U of Chicago Press, 1987. 21-22.

[54] Darwin, Charles. *The Descent of Man.* ed. James Moore and Adrian Desmond. New York: Penguin, 1994. 68.

[55] Ruse, Michael. *The Darwinian Paradigm: Essays on its History, Philosophy, and Religious Implications*. London: Routledge, 1989. 42.

[56] Richards, 12-13.

[57] Qtd in Gruber, Howard. *Darwin on Man.* Chicago: U of Chicago Press, 1981. 286.

[58] Ruse, 32.

[59] Darwin, Charles. *The Origin of Species.* ed. William Bynum. New York: Penguin, 2009. 214.

[60] Dixon, Thomas. *The Invention of Altruism: Making Moral Meanings in Victorian Britain*. Oxford: Oxford UP, 2008. 132.

[61] Richards, 84.

[62] Dixon, 142.

[63] Yeazell, Ruth, ed. *Sex, Politics, and Science in the Nineteenth-Century Novel.* Baltimore: Johns Hopkins UP, 1986. 9.

[64] Clark, Robert. "Riddling the Family Firm: The Sexual Economy in *Dombey and Son*," *ELH* 51 (1984): 69-84. 70.

[65] For a recent, cogent consideration of the Whittington narrative in relation to Cuttle and Gills, cf. Sadrin, Amy. *Parentage and Inheritance in the Novels of Charles Dickens*. Cambridge: Cambridge UP, 1994. 51-52.

[66] Qtd. in Sadrin, 55.

[67] Sadoff, Diane. *Monsters of Affection: Dickens, Eliot, and Bronte on Fatherhood.* Baltimore: Johns Hopkins UP, 1982. 63.

[68] Shor, Hilary. *Dickens and the Daughter of the House*. Cambridge: Cambridge UP, 1999. 53.

[69] *Ibid*. 54.

Chapter Four

"The Interval of Expectation": Delay, Delusion, and the Psychology of Suspense in *Armadale*

"Make 'em laugh, make 'em cry, make 'em wait." –Wilkie Collins

Recent criticism on the sensation novel, in its haste to historicize, has seized upon the trope of textual speed. These readings make the novels' nerve-racking action a metonymy for the experience of an increasingly frenetic, fast-paced British nation. Forging a connection between sensation fiction and emergent industrial technologies, for example, Nicholas Daly writes that "we can see in the sensation genre an attempt to register and accommodate the newly speeded-up world of the railway age." For Daly, these accommodations are performed specifically through the novels' "deployment of nervousness," the instantaneous transmission of feeling from texts to readers' bodies.[70] The defining term of the novels is their speed, the rapid pulse of sensation that both Victorian critics and their contemporary counterparts point out. Through the novels' immediate impact upon the nerves, readers are trained to operate within an increasingly accelerated social system. Thus, the experience of reading reflects the same pressures and compulsions that were shaping British society as a whole—the new influx of sensory stimuli brought by the trends toward urbanization, commercial expansion, and rapid technological change in the latter half of Victoria's reign.[71]

Literary history's emphasis on the speed of sensation, however, has obscured

compelling questions about the sensation novel and its relation to nineteenth-century theories of feeling. While critics have astutely aligned the genre with the changing conditions of Victorian life, these critical investments have actually deflected attention away from the cultural history of sensation. During the middle decades of the nineteenth century, scientists began to re-define the study of sensation through the terms of expectation, interruption, and lag. Spurred by Hermann von Helmholtz's startling discovery of the exact velocity of the nerves in 1850, figures from a range of backgrounds revealed an interval of delay—a gap between physical stimuli and their resolution in consciousness. As artifacts of the past, scientists suggested, sensations were mere approximations of a prior reality. In the writings of scientific popularizers, moreover, the physiological phenomenon of delay appeared in the service of more speculative studies on the effects of irresolution and psychic languor in industrial culture. The rise in medical models of delay (and, specifically, delay's status as a new symptom of mental malaise) marks a crucial turn in the history of sensation, I argue, in which sensation novels were ineluctably intertwined. Working to challenge the ostensible opposition between feeling and its deferral, in these novels delay developed as a source of empowerment, a foundation for fiction's radical allure among audiences implicated in an increasingly routinized, ever more efficient culture of speed.

This chapter re-situates current criticism on sensation novels through a reading of the science of sensation at mid-century, and reveals how new, neurological theories of delay developed in relation to the aims and assumptions of an emergent literary genre. During these years, the central concerns of novelists coincided with those of scientists working at the same time, so that connections occurred even in the absence of explicit

authorial intention. I turn to Wilkie Collins's novel of expectation and inheritance, *Armadale* (1866), as a case in point. Concentrating upon the novel's foremost protagonist, Ozias Midwinter (and, to a lesser extent, upon the contrasting character of Lydia Gwilt), I examine Midwinter as an archetype of the delayed reactor as this type took shape in the later 1860s. At the outset of the novel, Midwinter's "hesitation" appears pathological in nature.[72] But the story then turns upon itself by suggesting that these hesitations are actually advantageous and desirable, as they enable Midwinter to escape the scheme against him. Time and again, the text discloses its characters' solipsistic impulses only to displace those observations onto other, less circumspect figures. The effect is not so much to recuperate nervous delay against new medical models, but rather to blur the hardening boundaries between normative and pathological patterns of delay as such.

Delay has two clear corollaries in *Armadale*: neurasthenic characters such as Midwinter and Gwilt who consistently have trouble defining the truth or facts of their experience, and a narrative that hesitates to focus events or to proceed towards a satisfactory explanation of events. The story systematically refuses the teleologies that it sets up--alternately asserting spiritualist and materialist meanings, and moving between determinist and individualist interpretations—often denying direct representation of the action altogether. My emphasis lies in the interplay between the novel's lagging sensitive subjects and the impulses of a plot that perversely withholds a single source of interpretive truth. As we shall see, *Armadale*'s inquiry into the nature of the nervous body (delay's status as an empirical, embodied experience) is translated increasingly into an ideology of the aesthetic (its status as a principle of narrative form). What delay "means" for figures in the plot, in other words, resolves into the further issue of what it “does” to

readers' nerves, so that the novel's solution to the nature and effects of sensory delay is instantiated in its own prolonged patterns of postponement. Delay takes shape as a source of satisfaction in reading *Armadale* itself, even as reading remains a deeply disorienting experience.

Just as Collins's friend and literary mentor, Charles Dickens, upholds the value of non-reproductive sexualities in *Dombey and Son*, Collins works to imagine the generative outcomes of non-productive psychic states. In both cases, these writers define themselves and their texts against the productivist values of work and assertive agency in the public sphere as the very basis for positive social change. In characteristically bohemian fashion, Collins acknowledged delay's status as a symptom of psychic perversion, but only to open up a range of richer, expansive effects which were closed off to more middling sensibilities. In contrast to the classic Victorian virtues of industry and rational action, Collins's arch-protagonist appears a dilettante defined against the utilitarian aims of the social establishment. This sort of characterization coincides with Collins's experiments in the expected form of the novel during the 1860s. As he wrote in his 1861 preface to *The Dead Secret* (published at the cusp of a decade-long surge in sensation fiction), "[a]fter careful consideration, and after trying the experiment both ways, I thought it most desirable to let the effect of the story depend on expectation rather than surprise."[73] In *Armadale*, we see this "experiment" take shape as an actual focus for the novel's aesthetic and political program. Nervous "expectation" at once shapes and alters the realities represented in the text. Delay appears as a basis for both characters and plot, and also what withholds any unmediated access to their truth. As it explores Midwinter's morbid machinations, the novel spins out a series of competing claims which work to intensify

and invert its ideas about the nature of nervous delay, in ways which ultimately undermine the possibility of any absolute line of demarcation between the normative and the pathological, freedom and determination, representation and the real. In this sense, the novel's inquiry into the nature of nervous suspense entails nothing less than an attempt to claim cultural cachet for sensation fiction itself, as a form of mass entertainment whose allure lay precisely in its dangerously distracting powers of influence, its impact upon the minds and bodies of an audience coming to terms with a rapidly accelerating social order.

Far from reflecting the norms of a new culture of speed in the 1860s, then, *Armadale* refuses to rest in its orthodoxies of value. In particular, the novel's fascination with psychic lassitude is related to newly awakened anxieties about masculine resolution in the public sphere. In light of the newly consecrated cultural canons of work, duty, and self-help, passive introspection came to be seen in the mid-Victorian period as dangerously effeminate. Anxieties about delay were codified in increasingly gendered terms, so that signs of irresolution served to demarcate masculine social competence from its dilatory other, the unmanly failure of autonomous action. The positive potentials of psychic delay are *Armadale*'s response to the progressively powerful demands placed on Victorian men to ward off excessive inwardness and to act assertively in the public arena. It is precisely by resisting these ideological imperatives that Midwinter defeats the threats against him and arrives at a new standard of personal and professional accomplishment. As an aspiring author in the epilogue, Midwinter represents a new standard for the professional male writer, a vocational vision defined by his very delay. In this manner, Collins constructed an alternative masculinity that enshrined the enabling effects of irresolution and languor rather than decisive action, and which made these seemingly

pernicious potentials into a new foundation for fiction and for the writer of popular fiction in the mid-Victorian period.

Collins's often-repeated literary motto, "make 'em laugh, make 'em cry, make 'em wait," assumes special significance in this light.[74] Far from the unspoken antithesis to sensation--everything that sensation is *not*—in *Armadale*, "make 'em wait" appears as its culminating phrase, the paramount impulse in Collins's fictional program. This program corresponds closely with the composition of the novel itself, so that *Armadale*'s creation recapitulates the tenets of art that Collins so emphatically espoused. The first volume saw publication in November 1864, nearly three years after Collins arranged terms with the *Cornhill* magazine. Subsequent serial installments were interrupted by family difficulties, bouts of rheumatism, and a growing addiction to laudanum, all of which combined to impede progress for nearly two more years.[75] ("My mind is perfectly clear—but the nervous misery [...] is indescribable," he wrote to his friend Edward Pigott in 1864.[76]) Collins notes this fact in the preface to the first single volume edition, in which he informs readers that the book "was not hastily meditated, or idly wrought out" (4). What is most significant, here, is the strikingly reflexive framework in which the novel operates. Collins's creative setbacks are articulated in the text's own incitements to suspense, as if to work through these very authorial anxieties in the service of a new vocational ideal. Impelled by the specific pressures of the literary marketplace--just as much as by the epistemologies of speed taking shape in British culture as a whole--Collins comprised an aesthetic that rather than valorize haste inveighed against it, and turned instead to the positive potentials for nervous "hesitation" (157) as an alternative to modern modes of regulatory order, efficiency, and rational self-control.

I. "A Kind of Restiveness in Almost Every One's Mind": Delay and Delusion

The history of sensation in the nineteenth century is above all a history of ideas about the relation between mind, brain, and environment. Formerly metaphysical entities such as memory, perception, and will were explained in empirical terms: "mind" was diffused throughout its physical substrates in the body, and the organism as a whole was implicated in its surroundings. During the first half of the century, however, the nature of nervous movements remained stubbornly recalcitrant to science, a fact that left the direction, speed, and motive sources of sensation subject to many abstract speculations. The turn from this state of affairs to the rise in reaction-time experiments in the later 1860s and 1870s marks a crucial shift in nineteenth-century medical models. By the second half of the century, a new science of sensory delay could claim to chart the truth of sensation in the body, and, from this foundation, to build up an objective basis for the study of the self. My aim, here, is twofold: to trace the emergence of the delayed reactor (his visibility, in British and continental contexts, as a distinct social type), and to show how this type took shape alongside the aims and assumptions of novelists such as Wilkie Collins.

Medical models of delay developed from several distinct disciplinary contexts in the nineteenth century, the most formative of which centered on the so-called "personal equation." This emerged out of late-eighteenth and early-nineteenth-century astronomical observatories, beginning when the Belgian astronomer Friedrich Bessel noted a common tendency towards delay in notations of stellar transit times. The notations called for painstaking precision: marking the exact instant at which objects passed through the cross-wires of a telescope, astronomers tried to estimate the objects' overall velocities.

After comparing an array of notations over two years, however, Bessel found that slight degrees of delay were widespread, uncontrollable, and thus intrinsic to the human organism. His findings were published prominently in 1822, accompanied by a complete algebraic model for calculating individual rates of delay, and to arrive again at a perfect present of observation.[77]

The birth of the personal equation was hailed as a landmark intellectual event, and British luminaries such as William Whewell and John Herschel soon interpolated it into popular contexts.[78] The physiological psychologist William Carpenter commented upon the personal equation explicitly in his *Mechanical Philosophy* (1844). "It is a remarkable circumstance," writes Carpenter, "that some persons see the passage of a star, or make any other similar observation, a considerable part of a second earlier than others."[79] For Carpenter, the issue is a scientific "singularity." The signs of postponement matter precisely because they "[are] not easily to be accounted for" and are "independent of [observers'] instruments," so that the issue can be resolved by way of analogy alone.[80] Drawing attention to new railway technologies, he points out that the apparent stasis of the carriage belies the actual speed of the passing scenery. Sliding from the literal to the symbolic, Carpenter considers the essential slippages of human perception without actually addressing the physiology of the human body.

A key problem in the 1840s was sensation's seeming rapidity, which scientists simply could not hope to measure. As the noted German scientist Johannes Müller observed in *The Physiology of the Nerves* (1843), "[t]he attempts made to estimate the velocity of nervous action have not been founded on sound experimental principles."[81] However, Müller's former pupil Hermann von Helmholtz soon discovered a means of

doing just that. Working with a pair of electrodes attached to a frog's leg, in 1850 Helmholtz announced that he had calculated the rate of nervous propagation at about fifty meters per second--far slower than current electricity.[82] Helmholtz's findings were published widely in British and continental contexts in the early 1850s, in a way which altered basic assumptions about animal bodies. Far from being fine-tuned machines, contrivances approximating the watch-like perfection of our Creator, we were subject to a set of haltingly slow signals to and from the world. Just as Helmholtz demonstrated the powers of an empirical approach to the nerves, he helped to articulate the proleptic nature of observation itself.

In subsequent years, British scientists and intellectuals translated the fact of delay into new mental models. In his monumental *Senses and the Intellect* (1855), for example, Alexander Bain uses Helmholtz's discovery of "a certain delay" to reveal the merits of physiological science for the study of mind.[83] Taking his cue from figures such as Carpenter, Bain begins by comparing sensory stimuli and the signals of a telegraph. Bain notes that current electricity travels with an "inconceivable rapidity."[84] But this metaphorical connection between telegraphic technologies and neurophysiological networks resolves into catachresis: as it turns out, it points precisely to what sensation is *not.* As Bain concludes, "the nerve force is propagated far more slowly" than current through a wire, so that "[t]here is always a certain delay" in sensation.[85] Similarly, the noted scientist and popularizer James Sully identified "duration" as a vital issue in his *The Senses and Intuition* (1874). As Sully explained in the opening chapter, "Recent German Experiments in Sensation," "[i]t is probable that there exists some limit of duration below which nervous change fails to produce a sensation." Accordingly, he

writes, "[a]ny advance towards the proof and measurement of this minimum interval would be of great value in helping one to determine the minimum duration of a definite and recognizable sensation."[86] For both Bain and Sully, the study of delay marks the strongest prospects for mental science and distinguishes prior perspectives from more forward-looking, empirical approaches to psychic life.

Lay scientific writers wielded powerful influence in the construction of delay, as they worked to translate scientific studies into the larger cultural imaginary where literal truths about the body could wield symbolic significance.[87] We can see this tendency take shape specifically in the work of Henry Maudsley in the later 1860s. Widely renowned as a popularizer of new medical theories, Maudsley translated physiological discoveries about delay into a set of more widespread cultural concerns for Collins and his middle-class audiences. In Maudsley's hands, delay becomes the popular experience of a kind of masculine unwillingness to act. The empirical phenomenon of delay (the time it takes for a stimulus to travel from a sensory organ to the spinal cord or brain stem and, from there, to resolve into mental experience) is extended as a much more pervasive problem of psychic lassitude (the irresolution of the emasculate male subject). By building a coherent typology of the delayed reactor--complete with a set of common characteristics and traits—for Maudsley, the issue of irresolution could be diagnosed, treated, and thus contained in the discipline of the nervous body.

With Maudsley, then, the physiology of the nerves becomes one site of a larger cultural ethos: "delay" becomes visible as a new challenge in the formation of efficient, rationally-acting male subjects. This agenda appears in Maudsley's *The Physiology and Pathology of Mind* (1867), published in nearly the same space of years as *Armadale*.

"This time-rate of conduction," Maudsley writes, "varies in different persons, and at different periods in the same person, according to the degree of attention; if the attention be slight, the period is longer and less regular, but if the attention be active, then the period is very regular."[88] Concerted acts of "attention" can create a more standardized rate of nervous response, while its dispersion results in a more sluggish sensorium. But "whether the attention be great or little," he concludes, "a certain time must elapse" (370). The empirical fact of delay is extended into a new pathological phenomenon in need of careful control. The issue cannot be eradicated out of hand, but only disciplined by degrees of rigorous resolve.

The powers of sustained self-control, in healthy minds, find their corollary in the lagging nerves of less competent subjects. "Delay" becomes synonymous with a deranged state of languor. "Although no such researches into the cerebral centers as those have been made into the conditions of conduction by nerve have been made," writes Maudsley, "we may not unfairly apply the analogy to psychical activity" (371). "[A]nalogy" extends empirical science into the regions of subjectivity, as Maudsley makes a leap from the exact velocity of the nerves to the workings of character and consciousness--and, in particular, to the problems of indolence, torpor, and personal weakness. He focuses specifically on the effects of "overwork," "emotional anxiety," "hereditary taint," and "direct injury," all of which may result in a "deviation from the normal state" of nerve function (377). In almost all cases, "deviation" defines an absence of self-control, "an innate feebleness of nerve" and an associated failure to master the demands of mid-Victorian life (377).

For Maudsley, the study of the "time-rate[s]" affords a firm foundation for the

study of mental states (370), a program of research to focus upon the pathological absence of personal resolve. But this program is itself embedded within a still larger conceptual framework; not simply the "singular" issue set forth by William Carpenter, for Maudsley the pathology of delay ("nerve pathology") can be best understood in light of longstanding philosophical concerns (374)). "'There is,' says Locke, 'a kind of restiveness in almost every one's mind. Sometimes, without perceiving the cause, it will boggle and stand still, and one cannot get it a step forward; and at another time it will press forward and there is no holding it in" (371). The potential for perversion appears latent in "almost every one's mind." Maudsley explains, "[t]he oppression of mental suffering is notably attended with great sluggishness of thought, the train of ideas seeming to stand still, and even perception being imperfect" (371). Sensory lag is aligned with "great sluggishness," which in turn takes shape as a specific symptom of "mental disease." Analogy (between nervous "time-rate[s]" and the operations of mind) slides still closer to correspondence (370). Maudsley's language shows how the measurement of nervous velocities becomes symbolized within the larger cultural consciousness, so as to blur the boundary between empirical estimates and a more speculative science of mind. He concludes:

> In many cases of affection of the brain [...] a considerable time must elapse between a question asked of the patient and his reply: there is, as it were, a sluggishness of the mind, which perceives and reacts more slowly than natural. Such facts, proving beyond all question that the rapidity and success of mental processes are dependent upon the physical condition of the supreme nervous centers, prove also that time is an essential element in every mental function. (371)

Maudsley imagines an entire experimental scenario in which the problem of delayed reaction can be addressed. Within the terms of Maudsley's physiological plot, scientists elicit specific responses from the patient in order to observe the time taken to respond. By

working directly upon the unnaturally slow or enfeebled subject, these scientists would diminish delay and thus establish the grounds for more efficient, assertive actors.

In Maudsley's scenario, "affection of the brain" is traced to the patient's particular rate of "react[ion]" (371). But this fantasized scene was far from anomalous; in fact, it appeared at the outset of an explosion in reaction-time experiments during the later 1860s and 1870s. These studies--from continental figures such as Franciscus Donders (in Belgium) and Wilhelm Wundt (in Germany), and in the work of later British scientists such as Francis Galton--devised many new techniques for measuring rates of nervous delay. What was in Maudsley's text a general theory of "time-rate[s]" (370) is instantiated, in the study of reaction-times, as a distinct object for research and an impetus for the first psychological laboratories in the 1870s and early 1880s. Defined as the difference between sensory stimuli and their apprehension in consciousness, "reaction-time" became the key to understanding a wide range of psychic phenomena.[89]

Above all, the study of reaction-times marked an ostensibly objective means for scientists to classify subjective states. Galton, the British eugenicist, devised an assortment of tools and techniques for the study of reaction-times in his famed anthropometric laboratory during the 1870s and 1880s, where he attempted to lay the foundations for a new, eugenic society.[90] Similarly, continental scientists such as Sigmund Exner and Emil Kraepelin (known for establishing the distinction between neurosis and psychosis that still informs modern psychiatry) developed experiments in reaction-times in order to trace the effects of mental confusion.[91] For scientists such as these, the study of sensory delay held the promise of an impartial index into states of psychic perversion. Taking up Wundt's laboratory methods, they published on the effects

of alcohol, morphine, and other substances upon mental processes; forms of mania, melancholia, fatigue, and insanity could also be traced to time-rates of nerve conduction. The scientific popularizer Joseph Jastrow summarized these findings for English-speaking audiences in the last decade of the century. "Change of reaction times in insanity has been frequently observed," Jastrow reflects. "It seems probable that in most forms of mental disease, and particularly in melancholia, there is a considerable lengthening of the reaction time [...]. In the excited forms of disease, such as mania, a shortening has been observed."[92] The mind moves erratically, alternately "stand[ing] still" and "press[ing] forward" (in Maudsley's words) in ways which are deemed deeply deranging (371). The scientist, in turn, is responsible for tracing these temporal patterns, and thus for arriving at a more comprehensive knowledge of their etiology and effects.

Whether in the rise of personal delay in astronomical contexts, in its interpolation into British psychology, or in the formative findings of Helmholtz and his heirs, delay routinely represented a state of delusion. Increasingly, it became a newly identified nervous condition to be investigated in the study of the body. In the popularizing work of Maudsley, moreover, delay became visible as the symptom of a larger cultural anxiety--the breakdown of manly resolution and rational self-control. In fact, such popular texts suggest similarities between scientists and their literary counterparts in the 1860s. Both scientists and literary authors tried to elicit particular patterns of sensory stimuli in order to manipulate the minds and bodies of their subjects; and both turned time and again to the workings of sensory lag. We can see these parallels at play in *Armadale*, in which Ozias Midwinter's delay appears as a form of effeminizing vulnerability (codified, for example, in the " hysterical passion" (122) that the narrator attributes to him). Yet,

Collins seeks to resuscitate mid-Victorian models of male agency by positing the positive potentials of nervous delay itself—an agenda that finds fullest expression in the very vocation of the male professional writer in the novel, a figure defined above all as an expert in "mak[ing] 'em wait."[93]

II. *Armadale* and the Psychodynamics of Delay

First published in 1864, following the spectacular successes of *Basil* (1852), *The Woman in White* (1859), and *No Name* (1862), *Armadale* secured Collins's status as a leading light among nineteenth-century novelists. The novel presents itself as a story within a story, a narrative about the very nature of narrative suspense. Through the device of the father's confessional letter to the son, the novel examines the secret prerogatives of the past and the way in which they find fulfillment in the future. This tendency takes shape in two ways: first, through the supernatural framework of the Prologue, and again through the competing interpretations in which that framework is mediated and worked through in the next generation of Armadales. Consistently, Ozias Midwinter's attention to the past appears as a kind of morbid fascination--a state of distraction that is intensified whenever he attempts to engage with it. But the story repeatedly reverses its interpretations and shows that Midwinter's suspicions are actually correct, so that his nervous "hesitation" (157) is sanctioned as an enabling experience.

As it wrestles with these issues, the novel plays upon gothic conventions concerning the experience of the uncanny--the way in which former faculties, feelings, and thoughts could coincide in the epistemology of the present--but situates them within a specific set of Victorian psychological discourses. It explores liminal states of consciousness and picks up upon the devices of doubling and displacement, drawing

upon the madhouse as a site of disorder and ideological inversion. In Doctor Downward's sanitarium, in the finale, these themes culminate in the context of modern medical methods and diagnostic standards. And in this way, the problems of nineteenth-century psychological science are articulated in the formal and conceptual concerns of the plot. Like scientists and intellectuals in this time, the text meditates upon the nature and sources of psychic confusion, manufacturing narrative tension in these issues as a central aspect of the action. The novel focuses upon the distinctive delays, deferrals, and hesitations of its central characters, which function in turn as figures for the workings of the plot.

One of the defining terms in *Armadale* is "inherit[ance]" (30). The term finds formative expression in the frame narrative, which sets up the central concerns of property, personal legacy, and psychic pathology that alternately structure and destabilize the plot.[94] Its inset story takes the form of a deathbed confession from the father (Allan Armadale, Sr., formerly named Matthew Wrentmore) to the son (Allan Armadale, Jr., who later assumes the name Ozias Midwinter). Wrentmore's confession recounts his murder of an underhanded rival and former friend, Fergus Ingleby (to whom the Allan Armadale namesake also belonged), who attempted to steal Wrentmore's inheritance. In an act of retribution, Wrentmore murders Ingleby at sea; in his final moments at the Wildbad sanitarium, where the Prologue takes place, Wrentmore relates all this to his infant son, Midwinter. "I see danger in the future," says the dying father, "begotten of the danger in the past" (54). Earlier ills are transmitted to the next generation of Armadales, just as the disease of the father is passed on to the son, so that Midwinter and his new friend Allan Armadale (respectively, the sons of Wrentmore and Ingleby) are in danger of

reproducing the initial murder.

As the story takes shape, the distinction dissolves between the two generations of Armadales, so that the issue of inheritance appears as a transpersonal problem of influence. Patrimonial problems serve as the basis for a more expansive study of transmission itself.[95] By repeating its initial ur-plot in different registers, *Armadale* asks how earlier experiences can conspire with contemporary ones; it posits a point of indistinction between prior perceptions and sensations and actual, lived experience in the present. In this process there can be no primordial essence, but only a series of substitutions in which the Armadale identity is evacuated of any essential meaning.[96] The "blank place" in the father's letter (19), in which he relates the murder, is emphatically a void that can never be filled, and works instead as an archetype for the ensuing events. "As long as there is a page left," Midwinter says, "I shall read it. And, as long as I read it, my father gets the better of me, in spite of myself!" (127). The father's confessional letter functions as a kind of toxic text, a figure for the compulsive consumption of narratives and their effects upon the mind. It elicits a kind of captivation by the past and expresses the dangerously disorienting effects of that experience.

As a frame for what follows, the Prologue dissolves the very distinctions that it seems to build up, blurring the boundaries between the experience of the past and "the fatality" of the future (27). But it also sets up an overarching cultural context for such states of suspense themselves. By bracketing the action between the Wildbad public baths (at the outset of the novel, set in 1832) and Dr. Downward's private sanitarium (at the ending, set in 1851), the narrative enacts an arc towards more modern, medicalized modes of treatment—a science structured upon the diagnosis and treatment of particular

pathological types. If the novel incarnates, in Ozias Midwinter, the terms and traits associated with Maudsley's model of the delayed reactor, it also acknowledges the way in which social and cultural conditions can conspire to define those terms themselves. And in this way, the story suggests a kind of cultural genealogy for the way in which states of delay were emerging as a specific condition of the nerves at mid-century, even as it questions that trajectory through the machinery of its own slowly unfolding plot.

Time and again, the novel observes Midwinter's nervousness, his intensely inward and self-conflicted consciousness. He first appears after being discovered, disoriented and confused, in a field. A quintessential cultural outsider, he is defined as much by his "nervous restlessness" as by his "foreign look" (73; 67), by his "preoccup[ation]" as by his status as a loosely racialized male "vagabond" (73). The narrator observes:

> Ozias Midwinter, recovering from brain-fever, was a startling object to contemplate, on a first view of him. [...] Mr. Brock could not conceal from himself that the stranger's manner was against him. The general opinion has settled that if a man is honest, he is bound to assert it by looking straight at his fellow-creatures when he speaks to them. If this man was honest, his eyes showed a singular perversity in looking away and denying it. Possibly they were affected in some degree by a nervous restlessness in his organization, which appeared to pervade every fiber of his lean, lithe body. (73)

The discovery centers upon Midwinter's disordered body, and works in two ways—to assert the assumed abnormality of his "nervous restlessness," and to hold that assumption up to another, ironic interpretation. Midwinter is introduced "in a disordered state of mind, which looked to their eyes like downright madness" (67). But the passage proceeds to trace the tensions between his self-evidently "disordered state" and the "downright madness" that onlookers ascribe to that state.[97] This description is filtered through an undifferentiated "general opinion" of a "manner" (73). Insanity is defined by social norms and expectations, not by an objective observation of facts.

As *Armadale* advances, Midwinter's status is offered up to competing interpretations that suggest the role of social norms in determining the marks of mental malaise. His "nervous hesitation" (157) is made manifest through the cultural conditions in which he appears as a classless, half-caste male. The socially constructed nature of Midwinter's nervousness is nowhere more apparent than in the tale of his upbringing. "Everything Ozias Midwinter said, everything Ozias Midwinter did was against him," the narrator notes. "There he sat--his face averted; his hands mechanically turning the leaves of his father's letter [...]. With [...] a strange mixture of recklessness and sadness in his voice, he began his promised narrative" (104). Withdrawal appears as a defining attribute of Midwinter's speech, so that his language works to weaken any actual attachment to others; his "sardonic indifference" and "insolence" repel the sympathies of his audience (*A*, 104). But as the passage proceeds, its perspective shifts from identification with "any man" to those who observe his early sufferings. Increasingly, Midwinter's passivity appears as a learned response to the beatings and humiliations of his youth.[98] "Did you ever hear of a dog who liked his master the worse for beating him?" he asks (107). "I don't wonder at the horsewhip now [...]. Natural penalties all of them, sir, which the child was beginning to pay already for the father's sin" (105). Midwinter's manner of self-reproach at once echoes and ultimately undercuts his audience's antagonisms; in his very disavowal of sympathies, he calls attention to listeners' irrational refusals of it.

At the same time, these "natural penalties" are not entirely pernicious. In the context of Midwinter's story, these capitulations appear as a sign of resilience, a form of disengagement which works to defuse differentials of power. At every turn, such acts of resignation have an unexpected social potency, as suggested in the demise of his adoptive

"gipsy father":

> He made the dogs yelp first, and then he called to me. I didn't go very willingly—he had been drinking harder than usual, and the more he drank the better he liked his after-dinner amusement. He was in high good-humor that day, and he hit me so hard that he toppled over, in his drunken state, with the force of his own blow. He fell with his face in a puddle, and lay there without moving. I and the dogs stood at a distance, and looked at him: we thought he was feigning, to get us near and have another stroke at us [...]. When I did get him on his back, he was dead. (108)

The anecdote expunges every trace of aggression: the "amusement" and "good-humor" of his gypsy father function to obscure the essential brutality of the episode, in a way which works at once to abstract its violence and to define that violence itself as salutary and comic. In this context, the death of the father forms part of a larger movement towards the world of Thorpe-Ambrose and the new friendship between Midwinter and Allan Armadale. Thus, Midwinter's "nervous hesitation" is seen to inhere within the context of a larger life story that calls into question its essentially morbid nature, and instead sees it as an asocial form of power.

In *Armadale*, the line between normative and abnormal states is charted along a continuum of preoccupation and impulsiveness—an opposition that the narrative nonetheless renounces at every turn. The distinction is established emphatically in the differences between the two friends. Against the backdrop of Allan Armadale's frank, forthright Englishness--typified by the public school virtues of sociability, resilience, and physical prowess--is Midwinter's "nervous restlessness" (73), a weakness which manifests as a form of supreme skepticism and an almost insurmountable inwardness. If Allan looks like an embodiment of youthful vitality, Midwinter typifies its very antithesis, a figure of melancholic self-absorption. But as the plot proceeds, it becomes clear that Allan's assertiveness simply signals an absence of depths; he emerges as a

hollow, "flighty" example of such standards of social correctness (221). By portraying the perverse value of Midwinter's irresolution (what the narrator calls his "sensitive feminine organization" (265)), delay emerges as a new, more potent form of social empowerment.[99]

The central device in the advancement of the plot is the narrative of Allan Armadale's dream, which takes place in the company of his friend, Midwinter. The dream acts as a sort of switch point for the novel's competing interpretations of Midwinter's nervousness; it dramatizes the disorienting effects of his nerves, though it refuses to render them within the framework of psychic pathology per se.[100] In the Appendix to the novel, Collins explained his intention to leave the dream deliberately indeterminate:

> My readers will perceive that I have purposely left them, with reference to the Dream in this story, in the position that they would occupy in the case of a dream in real life--they are free to interpret it by the natural or the supernatural theory as the bent of their own minds may incline them. (820)

Readers are implicated in the same hermeneutic difficulties defining Allan and Midwinter. The "natural" and "supernatural" theories are amenable to opposing views which never resolve into a single standard of truth. By pitting its interpretations against one another, *Armadale* explores the limitations of any individual, isolated point of view and the explanatory principles at play in them.

The dream narrative is transcribed meticulously by Midwinter in a way which typifies the connection between writing and nervousness in the novel (a connection implicit in his father's deathbed letter, and which the talismanic narrative of the dream effectively replaces). The narrative of the dream entails a series of static scenarios--isolated events that are opposed to the story in which they are realized. In the inaugural incident, the dreamer sinks underwater with the father. "Here, where the deed had been

done," the narrator observes, "the fatal parallel between past and present was complete. What the cabin had been in the time of the fathers, that the cabin was now in the time of the sons" (150). In this manner, the dream undoes the systematic, serial progression of events and is the main way in which the past impresses itself upon the future. The event--a quite literal re-enactment of the drama of the past—appeals to Midwinter's anxieties about the impress of prior sensations into the present. His fascination with the dream marks a state of developing derangement, since the novel repeatedly represents his excessive responses to it. At the same time, however, *Armadale* also suggests that he is right to fixate upon the dream by revealing the close connections between it and subsequent events in the plot.

The contradictions of the medical account are articulated in the figure of Dr. Hawbury, who rescues the friends from the ruined ship on which the dream occurred. Hawbury, the resident physician, embodies the "essentially practical point of view" (173) of the British medical establishment. The narrator observes:

> The one absorbing interest in Midwinter's mind—the interest of penetrating the mystery of the dream—kept him silent throughout. Heedless of all that was said or done about him, he watched Allan, followed Allan, like a dog, until the time came for getting down into the boat. Mr. Hawbury's professional eye rested on him curiously, noting his varying color, and the incessant restlessness of his hands. (166)

For Hawbury, Midwinter's intense introspection appears as an unmistakable sign of disorder. But subtle shifts of perspective within the passage work to undermine the reading that Hawbury offers and that the text itself appears at least ostensibly to endorse. It begins by observing Midwinter's inmost mental processes, but then steps back to emphasize the doctor's perspective upon their external expressions, in a way which draws the reader's attention to Midwinter's pallor and restless, nerve-racked limbs. Midwinter is

given a somewhat summary reading that aligns the truth of the nervous subject with the outward signs of the body. However, Hawbury's haughty, slightly supercilious thought in conclusion ("'I wouldn't change nervous systems with that man, for the largest fortune that could be offered me'") is not so much a "professional" diagnosis as it is a personal slight (166). The doctor's most explicit pronouncement on Midwinter's nervous system is also, at the same time, his most suspect. Seen in this light, the passage points to the shortcomings of Hawbury's perspective *as* a personal perspective like any other.

As the action advances, the reader gains latent knowledge about the legitimacy of Midwinter's suspicions about the past, even and especially as Midwinter wrestles with their status as subjective sources of truth. This tendency takes shape specifically in his attempts at surveillance in Lydia Gwilt's first full scenes at Thorpe-Ambrose. At this point, Gwilt—who appeared in the Prologue as a young unnamed female facilitating Fergus Ingleby's scheme against Matthew Wrentmore—has re-emerged, in another guise, as the new governess to Allan Armadale's beloved. Armed with a written description of her figure, Ozias spies her for the first time. "He was self-possessed enough, in the interval of expectation, before the governess and pupil reached the end of the walk, to open Mr. Brock's letter" (334). At the "interval of expectation," Midwinter appears as a model of self-possession. His actions carry an assurance seldom seen in his character, which allows for a carefully considered response to the situation. However, it turns out that such "dogged resolution" only impedes his efforts at detection (334), in a way which actually affirms his more irrational, irresolute impulses. "In all that related, to his position towards his friend," the narrator observes, "he had reached an absolutely definite conclusion, by an absolutely definite process of thought. [...] In the place of the Dream-

Shadow, there had stood, on the evidence of the rector's letter, not the instrument of the Fatality--but a stranger!" (337-338). Midwinter's hesitation—the inauspicious "interval" indicated in the subordinate clause—appears as a dangerously stultifying state to be overcome by "definite" thought and action; but then this state is then purified of its pejorative implications, since its alternative is all the more problematic (334; 337).

In following a logical analysis from the facts, Midwinter is simply led to an illusory interpretation of events. And, in turn, this "absolutely definite process of thought" erodes his faith in his own "vague suspicions" (337; 782), even as we are asked to acknowledge that these suspicions are correct. The events "shak[e] Midwinter's trust in his own superstition, in the one case in which that superstition pointed to the truth " (339). The "interval of expectation" appears as a dangerously disordering event (334); however, such states of suspense stand time and again as alternatives to more normative models of psychic composure.

In *Armadale*, then, there is no teleology towards psychic and social health, but only a process of inversions that intensify and redouble upon initial interpretive issues. Unlike Maudsley's physiological plot, in which medical authorities attempt to restore their enfeebled male subjects to efficient action, *Armadale* perversely refuses such a narrative of nervous recovery. For, at almost every turn, Midwinter's wayward impulses are revealed to be *right.* Accordingly, Midwinter's struggle to renounce his "nervous restlessness" (73) is itself renounced as the weight of his social and psychic inheritance continues to accumulate. In order to allay his fears about the past, Midwinter tries to build up a more socialized persona, an antithesis to the brooding, melancholic character introduced earlier. At an informal gathering at Major Milroy's in Book Two, he is

described "bursting into the strange outbreak of gaiety which had revealed in Allan's eyes a new side to the character of his friend" (264). Midwinter's "strange outbreak of gaiety" only heightens his self-conflict, as its excesses escape his powers of rational control.[101] His struggle to construct a free, uninhibited persona in the present has the effect of "fettering him at that moment as [his superstition] had never fettered him yet" (265). Thus, the narrator notes, "Midwinter had roused himself to efface, by main force, the impression which his own altered appearance had produced" (265). Far from a weakness, Midwinter's passionate "reserve" (266) signifies a desirable alternative to any unrestrained sociability. "Well, if I can't laugh," he says, "I can wait" (239).

The chapter finds focus in another register through the device of Major Milroy's own obsession, a characteristically erratic clock. The clock is itself a miniature reproduction of a celebrated Strasbourg masterpiece--an artifact known internationally in the nineteenth century for its unerring accuracy.[102] At the stroke of noon, Milroy promises a scale version of the Strasbourg display, a procession of figures circling the clock and cut down by time's scythe:

> There is one point of resemblance between the great clock abroad and the little clock at home that they both show what they can do on the stroke of noon, and as it is close to twelve now, if you still wish to visit my workshop, Mr. Midwinter, the sooner I can show you the way to it the better [...]. (267)

In fact, the point of the scene is that the mechanism works to exemplify irregularity and not perfect precision; the ideal of a pure present is set forth simply to be abandoned again. "The machinery is a little complicated, " Milroy explains. "Sometimes the figures go all wrong and sometimes they go all right. I hope they may do their best on the occasion of your seeing them for the first time" (269). At the comic climax of the episode, the dinner party watches as the twelve figures fall to the floor:

> [the figures] tottered out across the platform, all three trembling in every limb, dashed themselves headlong against the closed door on the other side, and failed in producing the smallest impression on the immovable sentry presumed within [...]. The clicking of the major's tools was heard again among the machinery; the corporal and his party, restored to liberty, appeared in a violent hurry and spun furiously across the platform. Quick as they were, however, the hitherto deliberate sentry on the other side, now perversely showed himself to be quicker still. He disappeared like lightning into his own premises, the door closed smartly after him, the corporal and his privates dashed themselves headlong against it for the second time, and the major appearing again round the corner of the clock, asked his audience innocently, "if they would be good enough to tell him whether anything had gone wrong?" (270)

Time's scythe, in Milroy's model, just as in the machinery of *Armadale*, fails to sever its figures from the past. The comic violence of the episode repeats the patterns of the main plot; it acts as an emblem for Midwinter's struggles with the past, as the novel traces the continuities between contemporary experience and the inherited pressures of history.

The symbolic associations of the clock—its status as an allegory for the nervous subject--are made literal in Midwinter's response to it. Midwinter's excessive laughter turns the comic scenario into another scene of self-loss, the "delirium" induced by his attempts at sociability. The narrator observes:

> There are limits even to the license of laughter; and these limits were so outrageously overstepped by one of the party as to have the effect of almost instantly silencing the other two. the fever of Midwinter's false spirits flamed out into sheer delirium as the performance of puppets came to an end. His paroxysms of laughter followed on another with such convulsive violence, that Miss Milroy started back in alarm. (271)

The episode entails more than one comic interlude among others (such as, for example, Allan's earlier scenes with Nellie Milroy). Instead, it announces itself as an inversion of such set scene pieces, a scenario to be taken seriously and that surpasses "even [...] the license of laughter." In fact, the events epitomize the novel's own production of the past--a miniature mock-up of *Armadale* and its account of temporal confusion.

III. Reverse Detection and the Politics of Suspense

Midwinter's hesitation, set forth in the initial chapters, provides a foundation for the novel's shifting interpretations of his character. Time and again, *Armadale* aligns him with the outward signs of disorder so that it can continue to consider the role of others' preconceptions in defining deviance as such. But just as *Armadale* advances a set of competing perspectives on Midwinter, it proceeds to transpose them onto the overarching dynamics of detection and surveillance that suffuse the main plot. The novel maps its two interpretations of the dream narrative--derived, respectively, from Midwinter's "vague suspicions" and Hawbury's rational analysis of facts--onto the styles of observation that define the characters and their central concerns. The story juxtaposes the inductive inquiries of Pedgift, Brock, Allan, and others (one the one hand) and Midwinter's own pre-established premise, his foregone conclusions concerning the "image of fatality" (on the other hand). And in this way, the novel extends its initial interests in the nature of the nervous subject. Attempts to uncover the truth of the body become a metaphor--and, as we shall see, also an actual metonymy--for the larger effort to detect the social ills in the world of *Armadale*. The effect is to collapse the diagnosis of physiological problems into the discovery of social ones, so that the interpretation of the body becomes crucial to the defense of the general good. In other words, the same strategies used to "read" Midwinter's nervous body are also those that are brought to bear upon social problems in the novel. Specifically, as we shall see, Midwinter's own "vague suspicions" are affirmed against the inductive approaches of the medical establishment.

In Collins's novel, then, the problems of surveillance neatly recapitulate the issues

of observation that take shape at the level of medical diagnosis. As Hawbury's foil, Doctor Downward, the sanitarium keeper, comments in the final chapters (explaining how he has guessed the author of an unopened letter):

> "I have simply pursued the inductive process of reasoning, for which we are indebted to the immortal [Francis] Bacon. How does this very important letter come into your possession? I can't insult you by supposing it to have been stolen. Consequently, it has come to you with the leave and license of the person to whom it is addressed. Consequently, he is the first person I think of. You see the process? Very good. (738)

Downward's "inductive process of reasoning" repeats the same strategies seen earlier in Hawbury's interpretation of the dream narrative. A rational analysis of facts, proceeding forward from point to point, offers a firm foundation for the truth; in Downward's hands, the method lends itself to a style of *social* observation. Indeed, Downward's sanitarium stands as an embodiment of these very principles: it is a panoptic site of observation, a space of surveillance which works to isolate and analyze the nervous subject, and which provides the setting for Midwinter's attempted murder in the end. For his part, it is only by virtue of his own "vague suspicions" that Midwinter is able to escape the institution. In this manner, the novel develops its two interpretations of the nervous subject in the criminal plot, in a way which works to wrest authority away from the medical establishment as an arbiter of psychic and physiological states.

In fact, the problems and possibilities of detection define all of Collins's novels in the 1860s, but *Armadale* re-distributes their terms in significant ways. Perhaps most famously, *The Moonstone* (1868)--widely regarded as the first detective novel in English--would frame Franklin Blake's abnormal mental state as a solution to the initial theft, so that the interpretation of the nervous body becomes a means of re-establishing social order. But *Armadale* refuses to follow this structure of detection, and derives narrative

energy instead from the productive friction between Hawbury's rational interpretation of Midwinter and the "vague suspicions" presented by Midwinter himself. In *Armadale*, detection is everywhere defeated: for example, Allan Armadale Sr.'s struggle to keep his confession from his wife in the Prologue, Brock's attempts to trace Lydia's movements in London, and Mrs. Milroy's efforts to keep tabs on Gwilt and her husband. These instances suggest a consistent disenfranchisement of observers, defusing their essential social powers. The most elaborate "spy" in the novel, Bashwood, comes to incarnate this tendency. As Midwinter's mock-rival and foil for Lydia's affections, Bashwood is marked as a figure unable to read basic social signals. His reports on Midwinter, Allan, Nellie, and others reflect an essential inadequacy along these lines. "There may be inconvenience, and possibly danger," Gwilt writes, "in having such a chicken-hearted creature as Mr. Bashwood in my confidence" (517). (The fear proves prophetic when his anger at Gwilt's marriage turns retributive, and he leaves Midwinter and Allan unwatched in the sanitarium.) Bashwood's shortcomings are epitomized in his exchanges with Jemmy Bashwood, his estranged son and a private investigator in London. Jemmy's contractual services suggest the breakdown of personal sympathies between the father and the son. Through their evacuated sympathies, the strategies of surveillance in the novel--in both its official and unofficial channels--are seen to be both inadequate to the truth and deeply divisive in its outcomes.

Thus, the central crux of the plot centers not so much upon the triumph of the observer, but the extent to which acts of observation fail as a form of social empowerment. In fact, the novel presents a dynamic of *reverse* detection derived from Midwinter's supernatural suspicions. For, the plot is not premised upon the disclosure of a

secret, unspecified transgression from the past; instead, that transgression is announced at the outset and is projected into the future. Rather than attempting to unearth an earlier crime, the crime itself seeks out those associated with it. Accordingly, the traditional locus of criminal detection--the body of the victim--fails to materialize in the novel. There can be no such source of objective evidence, but only a generalized presence that turns around to haunt others. In the act of drowning, Ingleby's body is lost but not annihilated, so that it is accorded a kind of spectral afterlife in posterity:

> "Is my father's crime looking at you out of my eyes," he [Midwinter] asked. "Has the ghost of the drowned man followed me into the room?" The suffering and passion that he was forcing back, shook the hand that he still kept on the table and stifled the voice in which he spoke [...]. (103)

It is not clear, at this point, whether the "ghost" is a real presence, or only the symptom of a morbid mind. Thus, the episode works with gothic and romantic conventions while remaining firmly grounded in a framework of sensation and perception. Either way, the traditional trajectory towards criminal detection is denied, so that the body of the victim is not a source of transcendent truth but, instead, allows the initial transgression to haunt those in the present. The motif resonates in other registers as well; the murderous Armadale Sr. is described as occupying a state of "death-in-life," in a way which aligns the liminal state of victim ("the ghost of the drowned man") with the assailant himself. The theme finds its culmination in Allan's miraculous "resurrection" at sea, after having been supposedly drowned at the hands of Gwilt's henchman, in a way which re-works these earlier events through the mediating framework of the friendship between the Armadales. In all of these ways, the conventions of criminal detection—beginning from the empirical evidences of the body—are rejected and neatly reversed in *Armadale*.

The circulation of rumor and public scandal has a similar, distinctively double-

edged valence. In Gwilt's hands, scandal is provoked precisely in order to evade detection, not as a source of social intelligence. Her plot--to marry Midwinter and to appropriate his original Armadale name in order to steal Allan's estate and fortune--turns upon the appearance of having eloped with Midwinter. She does not accomplish this by avoiding the public eye, but by appearing conspicuously before it. "Nobody escapes observation in the country" (331), Brock notes. Gwilt turns this fact to her advantage by working within the constraints that follow from "observation" itself. The narrator comments:

> Nothing occurred (for nothing could occur) to dissipate the delusion on which Miss Gwilt had counted--the delusion which all Thorpe-Ambrose now shared with Mr. Bashwood, that she had gone privately to London with Allan in the character of Armadale's future wife [...]. (585)

The "delusion" described, here, is only a further form of the sort of story-telling in which Gwilt engages throughout the novel. The "private" story circulating in Thorpe-Ambrose is precisely the one Gwilt has tried to tell to everyone. The appearance of privileged information folds into its opposite, a kind of collective coercion. The informal gaze of the community does not reveal the secret truth of the plot or police the actions of individuals; to the contrary, it provides a fulcrum for further transgressions. The effect is to underscore the essential difference between such styles of detection and the distinctively asocial suspicions set forth by Midwinter. As we shall see, it is most often Midwinter's self-directed gaze that glimpses the truth of Gwilt's scheme, in contrast to the public eye of the community.

In *Armadale*, then, Midwinter's "vague suspicions" are set up as signs of mental malaise so that they can be validated through the repeated failure of other, more established strategies of detection. By pitting the two tendencies against one another,

Armadale at once observes official views on the nature of nervous delay, put forth in nineteenth-century medical contexts, and raises further questions about the novel's own capacity to generate an experience of "continued suspense" in its readership.

But the terms and tropes of "wait[ing]" are not embodied exclusively by Midwinter; they also find focus in the perverse psychology of his counterpart, Gwilt. Gwilt schemes secretly to marry Midwinter, but only to take Midwinter's original name (as Allan Armadale), to murder the two friends, and then to claim the other Allan's Armadale's fortunes as her own. Gwilt appears as an explicit authorial figure--a "shadow" (171) who works to usurp the plot through the manipulation of melodramatic conventions and a pastiche of prior narrative tropes. "[Gwilt] persisted in giving a name which was on the face of it a false one; in telling a commonplace story, which was manifestly an invention" (94). She is a unique character who tells a "commonplace story," a singular voice within a story that recycles its own narratives. Ironically, in order to rightly apprehend the "shadow of the past" in Gwilt (147), Midwinter must become adept at reading former fictions. In this manner, the dynamics of nervous delay are expressed as a particular problem of readerly response: in order to trace the sensations of the past, Midwinter must become an effective reader.

As she struggles to enact her scheme against Allan and Midwinter, Gwilt projects a physiology of suspense that resonates richly with Midwinter's own. "[T]he irritation of continued suspense," the narrator notes, "had produced a change for the worse in Miss Gwilt's variable temper, which was perceptible to every one about her, and which, strangely enough, was reflected by an equally marked change in the doctor's manner"

(743). "Continued suspense" is instantly identifiable as an illness, clear to "every one" despite an absence of any definable traits. "Perhaps I am overexcited," she asks herself, "by the suspense and anxiety of my present position? Perhaps the merest fancies and suspicions are leading me astray?" (724). As her plan proceeds, "[s]ingular hesitation" emerges as Gwilt's central characteristic (92). "Why am I hesitating? Why not go on to step the third and last?" She asks (538). Stiffening herself to carry out the plan, Gwilt explains in her private diary, "I determined to snatch at [Allan's fortune] without allowing myself time to hesitate" (699-700). With Midwinter and Gwilt, the novel focuses the effects of prolonged postponement and asks how "hesitat[ion]" can unsettle the self. In this sense, the characters' ostensible opposition is really nothing of the sort for a large part of the plot. Both Midwinter and Gwilt are defined in terms of their unconventional mental capacities, the cultural marginality that they each evince as orphans seeking family ties.

Whatever the ostensible opposition between Midwinter and Gwilt, then, each endure the problems of an excessive imagination and the "continued suspense" that it entails. This fact is explored through the medium of their own writings. Through a shift in viewpoint that is characteristic of Collins's novels, in the latter chapters Midwinter marries Gwilt and starts a whole new authorial career far from Allan. In his attempts to cultivate a career as a newspaper journalist, Midwinter is absorbed by the pressures of print publication—a fact that Lydia dryly notes. "Day after day," she writes, "the hours that he gives to his hateful writing grow longer and longer; day after day, he becomes more and more silent, in the hours that he gives to me" (660). Indeed, in the newlyweds' chance meeting with an Irish doctor in their travel to the continent, Midwinter's writerly

"nerves" become painfully apparent. Gwilt reports their conversation:

> Finding that Midwinter was devoting himself to literary pursuits, our travelling companion warned him not to pass too many hours together at his desk. "Your face tells me more than you think,' the doctor said. "If you are ever tempted to overwork your brain, you will feel it sooner than most men. when you find your nerves playing you strange tricks, don't neglect the warning--drop your pen." (671)

Whereas Midwinter's professional prose is defined by its incessant delays and deferred gratifications, Gwilt's diary, which record those travails, reflect the desire for a pure present of experience. But this desire is itself offset by her diary's record of her own "continued suspense." While their writing has separate aims, they both express the essential experience of delay. Like Collins himself, whose composition of *Armadale* was racked by extensive postponements (due in part to an growing dependence on morphine), the symbolic storytellers in the novel are those who most fully incarnate such states of nervous delay.[103]

The problems and possibilities of hesitation find fullest expression in the finale, set in the newly-established sanitarium owned by Gwilt's accomplice, Dr. Downward. The sanitarium stands as an embodiment of modern medical methods. It draws upon gothic conventions about the madhouse as a site of confusion and reversal in order to parody the treatments made popular by Victorian medical reformers in the 1850s.[104] It draws upon gothic conventions about the madhouse as a site of confusion and reversals in order to project a self-conscious parody of the treatments made popular by Victorian medical reformers such as Joseph Connolly in the 1850s.[105] The doctor's "private snuggery" typifies the institution as a whole:

> Above the fireplace hung a collection of photographic portraits of men and women, enclosed in two larger frames hanging side by side with a space between them. The left hand frame illustrated effects of nervous suffering as seen in the

> face; the right hand frame exhibited the ravages of insanity from the same point of view; while the space between was occupied by an elegantly illuminated scroll bearing inscribed on it the time honored motto, "prevention is better than cure." (712)

The transparent trappings of middle-class domesticity--present in the ornate bookcase, glass doorways, and portrait-lined fireplace--function to frame the larger spectacle of the grotesque in the scene. The photographic portraits are aligned with the other animal specimens on the shelves ("as if they were sentient things"), in a way which simultaneously suggests the objectification of the nervous subject—exhibiting her anonymity and abstraction from the social world--and her status as an embodiment of a larger type. The two portraits appear at the center of the scene. Here, the distinction between "nervous suffering" and "insanity" becomes emphatic, as signaled by the "elegantly illuminated scroll" that stands between them. Downward explains:

> "And there is my System mutely addressing you just above your head, under a form of exposition which I venture to describe as frankness itself. This is no madhouse, my dear lady. Let other men treat insanity, if they like--*I* stop it! No patients in the house as yet. But we live in an age when nervous derangement (parent of insanity) is steadily on the increase and in due time the sufferers will come." (713)

The sanitarium is made legible as the symptom of a larger social shift--an epoch in which "nervous derangement" is increasingly prevalent. But the very effort to avert insanity depends paradoxically upon the struggle to define it as such. Precisely by suggesting what insanity is not, the doctor's preventative System is implicated in the production of pathological identities themselves. As it turns out, the classificatory types in the scene--respectively, "nervous suffering" and "insanity" are inextricable.

The doctor describes his methods in greater detail during a tour of the establishment:

> My system places you in a sphere of action in which the ten thousand trifles which must and do irritate nervous people at home are expressly considered and provided against. [...] I assert the medical treatment of nervous suffering to be entirely subsidiary to the moral treatment of it. That moral treatment of it, you find here. That moral treatment, sedulously pursued throughout the day, follows the sufferer into his room at night; and soothes, helps, and cures him, without his own knowledge" (770).

Downward's "system" suggests the illusion of autonomy, an artificial sphere of action allowing for the total tranquility of the nervous subject. Through its panoptic perspective, perceptions and sensations are regimented and carefully controlled. "A nervous patient who always has his own way," he concludes, "is a nervous patient who is never worried--and a nervous patient who is never worried, is a nervous patient cured" (774). The more that patients try to exert themselves, the more they are subsumed within this system. But, as we shall see, the finale foregrounds a clear breakdown in these strategies of observation: its comprehensive view is eluded through Midwinter's own "vague suspicions." The institution's powers of pacification become bankrupt just as the characters' states of "continued suspense" are rendered all the more rich and equivocal in nature.

Through a process of symbolic inversions, Midwinter and Gwilt are placed in a paradoxical position within the establishment, so that they are at once outsiders and also its most fitting subjects. When Gwilt appears in the guise of a nervous inmate (a performance that allows her to obtain the poison for her conspiracy), she enacts the role all too well. "The prevalent impression," explains the narrator, "was [...] that [Dr. Downward's] first inmate was mad" (770). The difference between Gwilt's fictional personae and actual psyche is eroded, here, in a way which works to call into question her essential powers of self-fashioning. Similarly, Midwinter's admission to the sanitarium merely marks the culmination of his own nervous condition. He acts in a way which at

once observes the protocols of the sanitarium and turns them on their head, so as to emphasize their inherent inadequacies in the treatment of the nerves.

In their very efforts to manipulate the conditions of entry into the institution, the characters reveal its status as a more or less arbitrary, more or less artificial arbiter of psychological states. The effect is to observe the disorderly nature of "continued suspense" (743) even as *Armadale* also suggests that it appears as a disorder only in certain contexts. By disclosing the social and cultural conditions in which science takes shape, *Armadale* asserts a sense of competitive authority over the medical establishment--an assertion about which the novel becomes increasingly emphatic.

The closing chapters, in particular, juxtapose the sanitarium and sensation genre. "The English novelist who enters my house," Downward explains to Gwilt, "must understand his art as the healthy-minded English reader understands it in our time. "All we want of him is—occasionally to make us laugh, and invariably to make us comfortable" (769-770). Elaborated from his system of "moral treatment" (772), Downward offers a physiological theory of art antithetical to *Armadale*. Whereas the sanitarium seeks to placate its inhabitants ("to make us laugh") and thus to free them from nervous suffering, the sensation novel depends precisely upon its provocations to "continued suspense" (743). The central irony of Downward's creed is that the sanitarium supplies the basis for the novel's own nerve-racking conclusion; although advertised as an anodyne to excessive feeling, in fact it incarnates the text's greatest incitements to sensation.

In keeping with the principles of the main plot, *Armadale* dramatizes two concepts of delay in the end. Delay appears alternately as a symptom of self-loss and as a

positive phenomena that fails to signify within the context of the sanitarium. Lured there to save Allan's love interest, Nellie Milroy, Midwinter moves through a set of abstract "associat[ions]" about his surroundings (796). "[Midwinter's] mind," the narrator notes, "clouded and confused by disturbing influences, instinctively took refuge in its impressions of facts" (796). Beginning with the belief in a "hidden danger" (796), his "disconnected impressions" gather gradually around a "vague distrust of what might happen next" (795; 794). Midwinter's most assertive action is an act of deferral: "[w]ithout a fact that could justify to other minds his distrust of what might happen with the night; incapable of shaking Allan's ready faith in the fair outside which the doctor had presented to him [...] the one policy he could follow, come what might of it, was the policy of waiting for events" (798). The story emphasizes how Gwilt loses self-possession as Midwinter slowly suffocates in Allan's cell. In the end, *Armadale*'s competing interpretations of delay are distributed between its two foremost figures. Whereas Midwinter's "policy of waiting" becomes a sign of resiliency and strength (798), Gwilt is sacrificed to the exigencies of the plot; "continued suspense" eventually erodes the very grounds of her self (798; 743). Midwinter's reinvigorated masculinity finds expression in the very ineffectuality of such suspense for *Armadale*'s anti-heroine. In the end, the novel's newly imagined ideal of male agency is available *only* as an ideal for figures gendered as male.

Gwilt's hesitations come about progressively as she tries to murder Allan. "A clock of the noiseless sort--incapable of offending irritable nerves--was fixed in the wall, above the first-floor landing " (779), the narrator notes about Allan's location. But ironically, the intervals of the clock only exacerbate Gwilt's already “irritable nerves.”

The final episode is marked not so much by the perfect precision of her actions, but rather by the progressive postponements that the clock at once observes and ironically intensifies:

> "The minute-hand of the clock travelled on half-way round the circle of the dial. As it touched the quarter-past one, Ms. Gwilt stepped noiselessly into the corridor" (798). "Turning from the window, she looked at the clock. It was twenty minutes past one" (800). "She pondered over it till the minute-hand of the clock pointed to the half-hour. 'No!' She said" (800). "After marking the time by a glance at the clock, she dropped into the glass funnel the first of the six separate Pourings" (801). "The first of the intervals of five minutes was endless. The time stood still. The suspense was maddening" (801). "[S]he was startled into sudden self-remembrance. She turned quickly, and looked at the clock; seven minutes had passed since the second Pouring" (802). "Three out of the next five minutes passed, and again the suspense began to madden her. The space in the corridor grew too confined for the illimitable restlessness that possessed her limbs" (802). "[S]he waited the event. A time passed: a time short enough to be reckoned by minutes on the clock; and yet long enough to take her memory back over all her married life with [Midwinter]" (805).

The progress of the clock marks an acceleration of events towards the ending, even as it also calls attention to Gwilt's lagging nerves. Her "illimitable restlessness," like the "nervous restlessness" of Midwinter's body, becomes the defining term of her experience (802; 73). But for Gwilt, "suspense" is quite literally "maddening," and threatens "self-remembrance" itself (801; 802). The passage cultivates suspense precisely by recording Gwilt's increasing rate of nervous delay and her deviations from the clock. The effect is heightened by the scene's shifting perspectives, as it alternates in between an objective, third-person narrator and Gwilt's indirect, increasingly confused commentary. "Oh, the time! the time!" She thinks to herself. "If it could only have been begun and ended with the first Pouring!" (801). The "last interval" is emphatically the first in which she appears in a pure present of experience: "as she gently closed [Midwinter's] fingers on the paper and looked up, the last minute of the last interval faced her, recorded on the clock" (806).

For Gwilt, "suspense" can end only in an act of self-annihilation.

In the concluding chapter, then, the clock acts as both a general metaphor for suspense and as an actual means by which the story arrives at a resolution. The scene marks a final synthesis between the novel's inquiry into *nervous* delay and its inducements to *narrative* delay because it is through the central characters' very hesitations that the story is brought to an end. The denouement evokes recent medical models of delay in its own closural gestures. Just as lay scientific writers such as Maudsley imagined a scientific setting in which sensory speeds could be measured and manipulated in order to express states of mental malaise, Collins conceived a similar scene in the finale. In Downward's sanitarium, nervous sufferings--"continued suspense" and nervous "hesitation"--are made legible through the exact intervals of the clock (743; 157). But *Armadale* does not passively reflect new and emergent experimental trends. In fact, these intervals remain an incomplete index into mental states, since Midwinter fails to appear at all in the final sequence. Not only does he renounce outward action, but this renunciation is enacted at the level of perspective and of fictional form. His "policy of waiting" remains distinct from Gwilt's carefully measured movements (798), so as to dramatize the very limitations of the medical establishment and its perspectives.

Ultimately, *Armadale* does not offer a single, comprehensive statement about the psychic effects of delay. Like the writings within the psychological landscape at mid-century, its meanings remain multiple and contested, so that no objective truth takes shape out of the circuitous sequence of proceedings in the narrative. In his refusal to accept the "rational view" of events in the epilogue (815), Midwinter remains susceptible to the same irrational impulses that define his character throughout the novel. The

boundaries between reason and unreason remain just as tenuous as they were throughout the text, resisting the impulse to arrive at a synthetic claim about the nature and consequences of "continued suspense" (743).

Yet, if the resolution refuses to vindicate fully the outcomes of reading suspenseful fiction, it does denote the positive potentials for delay in the act of writing. This becomes clear in the final lines of the epilogue, which chart Midwinter's ambitions "to take to Literature" (814). If Ozias's "hesitation" signified earlier as a symptom of social deviance (157)--specifically, in his status as a male vagabond devoid of a name or vocation—by the ending it becomes the defining term of an incipient middling identity. As an aspiring author, Midwinter comes to live with the fact of nervous postponement and to shape these tendencies to salutary, socially constructive outcomes. The irresolution that the novel has explored emerges, in the end, as an alternative model for the professional male writer. Thus, Midwinter ends where *Armadale*'s author began, as Collins came to experience an assortment of debilitating nervous ills in the service of a text "not hastily meditated, or idly wrought out" (4). But the end exonerates its author from any aberrant or excessive delays in the production of the text itself. For, as Midwinter's choice of vocation makes clear, this condition is not only common to the act of writing, but is in fact its most normative state.

NOTES

[70] Nicholas Daly, "Railway Novels: Sensation Fiction and the Modernization of the Senses," *ELH* 66 (1999): 464.

[71]Jenny Bourne Taylor explains that sensation novels "worked directly on the body of the reader" in a way which "encapsulated the experience of modernity itself--the sense of continuous and rapid change, of shocks, thrills, intensity, excitement." Taylor, *In the Secret Theatre of Home.* Oxford: Oxford UP, 1987. 3-4. In Alison Winter's words, "the route from page to nerves was direct." *Mesmerized: Powers of Mind in Victorian Britain*. Chicago: U of Chicago Press, 1998. 324. Like Taylor and Winter, D.A. Miller seeks to uncover the historical construction of sensation in the 1860s so as to trace "the social significance of nervousness." But while questioning the "the natural immediacy of sensation" in contemporary criticism, Miller remains unable to avoid the assumption that the novels naturally see sensation as immediate. Miller, *The Novel and the Police.* Berkeley: U of California Press, 1988. 149. My own emphasis corresponds more closely with recent scholars such as Nicholas Dames, who works to trace the overlapping patterns of nineteenth-century physiology and of fictional form. Dames's reticence about the sensation genre, however, obscures one of the most compelling sites in which such connections were forged. While his study seeks to recover the temporal experience of reading in the Victorian period, it tends to reflect a now familiar account of readerly acceleration. See Dames's otherwise exceptional "The Eye as Motor: Gissing and Speed Reading," in *The Physiology of the Novel: Reading, Neural Science, and the Form of Victorian Fiction.* Oxford: Oxford UP, 2007. 207-46. On similar responses to sensation novels in the nineteenth-century, see Taylor 7-10 and Winter 321-324.

[72] Wilkie Collins, *Armadale*, ed. Catherine Peters. Oxford: Oxford UP, 1989. 157.

[73] Wilkie Collins, *The Dead Secret,* ed. Ira B. Nadel. Oxford: Oxford UP, 1997. 5.

[74] Qtd. in Winifred Hughes, *Maniac in the Cellar: Sensation Novels of the 1860s*. Princeton: Princeton UP, 1980. 47.

[75] Catherine Peters, introduction to *Armadale*, by Wilkie Collins. Oxford: Oxford UP, 1989. ix-x.

[76] Qtd in Peters, introduction to *Armadale*, ix.

[77] Edward Boring, *A History of Experimental Psychology*. New York: Appleton, 1950. 147-9; Simon Schaffer, "Astronomers Mark Time: Discipline and the Personal Equation," *Science in Context* 2 (1988): 116-19.

[78] Schaffer, "Astronomer's Mark Time": 130.

[79] William Carpenter, *Mechanical Philosophy, Horology, and Astronomy.* London: W.S. Orr, 1844. 395.

[80] Carpenter, *Mechanical Philosophy*, 395.

[81] Johannes Müller, *The Physiology of the Nerves.* London: Routledge, 1993. 729.

[82] Boring, *A History of Experimental Psychology*, 54.

[83] William Bain, *Senses and the Intellect*. London: Longmans, 1855. 64.

[84] Bain, *Senses and the Intellect*, 64.

[85] *Ibid*. 64.

[86] James Sully, *The Senses and Intuition: Studies in Psychology and Aesthetics.* London: H.S. King, 1874. 39.

[87] For a recent account of lay scientific prose in the nineteenth century, see Bernard Lightman, *Victorian Popularizers of Science.* Chicago: U of Chicago Press, 2007.

[88] Henry Maudsley, *The Physiology and Psychology of the Mind*. London: Routledge, 1993. 370.

[89] On the rise of experimental psychology in the mid-nineteenth century, see Boring, *A History of Experimental Psychology*; David K. Robinson, "Reaction-time Experiments in Wundt's Institute and Beyond," in *Wilhelm Wundt in History*, ed. Robert Rieber and David Robinson. New York: Kluwer Academic Press, 2001. 161-97.

[90] Nicholas Gillham, *A life of Sir Francis Galton.* Oxford: Oxford UP, 2001. 211-14.

[91] Robinson, "Reaction-time Experiments in Wundt's Institute," 174-5; 189-90.

[92] Joseph Jastrow, *The Time-Relations of Mental Phenomena*. New York: N.D.C. Hodges, 1890. 23.

[93] Qtd. in Hughes, *Maniac in the Cellar*, 47.

[94] Taylor, *In the Secret Theatre of Home*, 152. My reading of *Armadale*'s interpretive instabilities draws upon Taylor's formative study, which traces the novel's intricate relationship to nineteenth-century mental models. Taylor emphasizes the novel's deep-seated ambivalence towards contemporary concepts of sensation, particularly as those concepts are reflected in the perverse psyche of Ozias Midwinter. But while

her study argues adeptly for *Armadale*'s deconstruction of emergent scientific discourses, my focus lies with the dynamics of delay that the novel puts in their place. Not only dismantling the terms of the medical establishment, *Armadale* also asserts the positive possibilities for nervous delay as an anodyne to delay's increasingly reified representations within science. Seen in this light, the novel at once registers popular perspectives on the physiology of delay and works to re-appropriate them as a basis for its own incipient cultural authority.

[95] Taylor, *In the Secret Theatre of Home*, 154.

[96] Taylor, *In the Secret Theatre of Home*, 153.

[97] In Taylor's neat formulation, "Midwinter's shiftiness and twitchiness are both cultural—the particular interpretation of a set of physical responses—and physiological." See Taylor, *In the Secret Theatre of Home*, 164-5.

[98] Taylor, *In the Secret Theatre of Home*, 165.

[99] The coincidence of nervousness and effeminacy has been often observed in current criticism of sensation fiction. Miller, for example, argues that "[t]he association of nervousness with reading is complimented [...] by its coincident, no less insistent or regular association with femininity." *The Novel and the Police*, 151; also see Taylor, *In the Secret Theatre of Home*, 165. Miller wishes specifically to trace the ways in which sensation novels discipline their sensitive subjects; effeminate male figures are represented only to be reformed en route to more masculine standards of selfhood in the end. But while *Armadale* does describe the effeminizing effects of Midwinter's nerves, I argue that this tendency actually resists conventional concepts of male agency, and constitutes a strategy of displacement that resonated thickly within the scientific and other cultural discourses of the 1860s.

[100] Collins himself stresses such competing implications in his Appendix to *Armadale*, "My readers," he says, "will perceive that I have purposely left them, with reference to the Dream in this story, in the position that they would occupy in the case of a dream in real life—they are free to interpret it by the natural or the supernatural theory as the bent of their own minds may incline them" (817). The dream can be explained equally in rational terms, as a purely physiological outcome of waking experience, or in terms of occult influence. For a full account of the dream narrative along these lines, situated specifically in the context of nineteenth-century dream theories, see Taylor, *In the Secret Theatre of Home*, 156-60; 166-7.

[101] Taylor, *In the Secret Theatre of Home*, 165.

[102] Zeitz, Lisa M., and Peter Thomas. "Collins's Use of the Strasbourg Clock in *Armadale*." *Nineteenth-Century Literature* 45 (1991): 495-503.

[103] Peters, introduction to *Armadale*, ix.

[104] Taylor, *In the Secret Theatre of Home*, 171.

[105] *Ibid.* 171.

Chapter Five

George Eliot's "Fine Excess": *Middlemarch,* Energy, and the Afterlife of Feeling

First inaugurated in the early 1850s, in the synthesis of the first and second laws of thermodynamics, energy physics offered a radical account of our world: the energy in existence is never destroyed, but merely moves into imperceptible channels over time.[106] These ideas inspired scientists such as John Tyndall and James Clerk Maxwell, as well as novelists like George Eliot, whose work exploited their moral, aesthetic, and epistemological premises. This chapter argues that Eliot found in energy physics a compelling model for social relations.[107] While conceding the increasing impoverishment of personal sympathy in the nineteenth century, Eliot tried to realize the optimistic outcomes of this fact--to see the failure of sympathetic bonds as a starting point for social renewal. Not just an alienating effect of nineteenth-century life, such shortcomings could connote the accumulation of energies within the community at large. Eliot's model of "surplus" feeling, as I call it, takes shape in both the formal and thematic registers of her work. It invigorated her developing doctrine of fiction, and appears in the particular problems of perspective in *Middlemarch* (1872). But ultimately, I argue, this model is realized most fully in the novel's effort to theorize the agency of the aesthetic itself. Through the expressive resources of energy physics, Eliot crafted a new theory about the purposive purposelessness of art: its incalculable influence upon the greater good, and its

power to circulate continuously, albeit indeterminately, within the life of the larger group.

I begin with an undated notebook entry composed by George Eliot soon after the completion of her most complex and ambitious novel to date, *Middlemarch*. Entitled "A Fine Excess: Feeling is Energy," the entry records the movement of Eliot's mind over a range of topics: contemporary religion, recent political debates, and (not least) the "languor" of reformist sentiment which merely pretends to personal sympathy. Taking up this latter point, the passage turns to the ethics underlying her own work, and culminates in a self-analysis of *The Spanish Gypsy* (1868), Eliot's extended blank-verse poem. The skepticism towards sympathetic exchange that Eliot's readers often detect in her later writing is clearly evident in the passage; but equally striking is Eliot's willingness to envision a vastly different model of melioration. She quotes her poetic narrator: "Tis the grandest death! To die in vain/For greater love than sways the forces of the world." Bringing together a tone of disarming candor and cool scientific detachment, Eliot comments:

> I really believe and mean this, --not as a rule of general action, but as a possible grand instance of determining energy in human sympathy, which even in particular cases, where it has only a magnificent futility, is more adorable, or as we say divine, than unpitying force, or than a prudent calculation of results.[108]

The point of Eliot's observation is not only that "energy" may look like waste or "futility," but that this outward correspondence is correct. In the affective economy that Eliot envisions, exhaustion and excess can constitute a single standard of action. Even though it fails to culminate in sympathetic union, such surplus feeling—emotion that fails to signify at the threshold of social utility—can continue to impact the community at large. In contrast to earlier models from Edmund Burke and David Hume, which centered upon actual scenes of sympathetic union, for Eliot the key event is the act of mediation

itself--the "determining energy" of emotion that, while not "calcul[able]," continues to circulate in culture.

What Eliot emphasizes are the social benefits of surplus feeling—the latent vitality of feeling that appears wasted or (in the language of *Middlemarch*) "incalculably diffusive" (838). Eliot's model of surplus feeling (as I am calling it) takes shape specifically through the inaugural claims of energy science in the mid-1850s and 1860s.[109] Eliot found in energy science a physical conception of value that could stand as an alternative to familiar nineteenth-century distinctions and classifications. While an economic calculus assumed a clear antithesis between the scarcity of resources and the accumulation of capital, science suggested that the sum total of "excess" energy is always increasing in nature. Contradicting the established logic of declining use-value and diminishing returns--"a prudent calculation of results"—surplus feeling attests to a more primary principle of *unproductive* energy: even as surplus feeling accumulates, it expresses an ever-increasing potential for further social growth. Eliot found these ideas especially attractive in her changing beliefs about the nature of social relationships and agency. They allowed her to acknowledge the severe limitations imposed upon individuals in the nineteenth century, even as they indicated other, more "divine" consequences of such constraints.

Eliotic surplus feeling occurs at a specific juncture in the history of affect, and springs out of a confluence of scientific and other cultural concerns. Departing from eighteenth-century intellectuals like Burke and Hume, who saw the recognition of pain as affirmation of universal humanity, Eliot came to challenge the ethical limitations of that ideal. These writers argued for an act of identification—seeing oneself in another—as a

foundation for sympathy.[110] In contrast, Eliot wanted to imagine a sympathy that was unwedded to the egoistic impulses of individuals. In place of a politics of recognition, she sought to trace an ongoing *process* of social relations: to show how one person's desires could be mediated through another, and again through someone else, and could thus impact others far removed from the initial actor. Even though that person's feeling might never find an expressive outlet, it could continue to impinge upon a range of individuals. This is to say that Eliot was searching for alternatives to more entrenched, transactional models of emotion—for a structure of feeling that refused to rest at the level of atomic agents. Science suggested just this sort of paradigm, predicated upon an ideal of constant co-relationships and an unending train of influences. In this sense, surplus feeling points to the persistence of emotion within the social medium, even and especially after its apparent demise. Such feeling has an afterlife, a "divin[ity]" in its very death. In her later fiction, we witness a concerted effort to define the nature and effects of such surplus, and to show just what its outcomes might look like in contemporary culture. Eliot's experiment takes shape specifically in *Middlemarch*, never more so than in the lives of her arch-protagonists, Dorothea Brooke and Tertius Lydgate. Their emotion is surplus in two ways: in that it is "unhistorical," or that it fails to register in conventional historical narratives; and in that it continues to accrue within the total system of relationships in the novel.

These two forms of excess epitomize Eliot's theory of surplus feeling and its curious appeal to an afterlife of emotions--the enduring effects of defeated desire. Creating a conceptual circuit between surplus feeling and nineteenth-century thermodynamics, Eliot forged a challenge to the dominant discourses of economics and

social reform at mid-century. But on a more basic level, she was challenged by energy science to re-think the basic relationship between organic vitality and the foundations of the subject--and, as a crucial component of this re-calibration, to re-plot her conception of organic *form* in the realist novel. Eliot used these ideas as a heuristic device, as a social model and not as an empirical framework.[111] In particular, Eliot saw in energy science a model for society that refused to rest at the level of distinct, isolated individuals, and which suggested instead a transpersonal pattern of affect. Ultimately, her theory of surplus feeling presents an explanation for the unproductive pleasure of novels. In Eliot's general economy of feeling, the "fine excess" of literature becomes the source of constantly accruing affective gain.

One of the most familiar *topoi* of nineteenth-century culture, the connection between passionate surfeit and self-disintegration served overwhelmingly to affirm the Victorian values of duty, restraint, and self-control. Too much feeling, Victorians believed, could leave one quite literally at a loss for oneself. (As the narrator in *Middlemarch* comments, the "roar on the other side of silence" could stifle the fragile sensorium (194).) The profusion of feeling could translate into a dangerously estranging experience, leaving the self susceptible to the external forces of the world. Somewhat curiously, then, Eliot invokes this idea only to invert it: the value of surplus feeling lies in its power to extend beyond the boundaries of the immediate self. Although socially aberrant, its unlocalized quality is precisely what enables it to persist within culture at large. Thus foregrounding a law of unintended consequences, the logic of surplus feeling makes contingency a positive phenomenon. For Eliot, such erratic energy can create connections between individuals at a far remove from one another, and who may not

otherwise engage in sympathetic experiences. Unconstrained by both political forces and the physical body, it "sways the forces of the world."

More broadly, Eliotic surplus feeling points to the powerlessness of the aesthetic itself. Like Tertius Lydgate's researches into the "last refinement of inward energy" (164), Eliot's experiment ends in an effort to re-cast the conventions of sympathetic exchange, rather than to repudiate them out of hand. But if her ambitions do not end in a transcendent scheme within *Middlemarch*, they continue to animate ideas about the politics and ethics of reading within British culture as a whole. For Eliot, surplus feeling finds is fullest expression in the "magnificent futility" of art: the wastefulness of its efforts and the waywardness of its energies are what typify the true value of fiction. While a narrative may not intervene in specific social occasions, or find perfect understanding in another, it may still impress readers at a vast distance from itself. In this sense, Eliot's engagement with energy science appears at a crucial moment in the history of the novel and its cultural capital: her ideal of surplus feeling persists in the "fine excess" of literature itself, and in the unproductive effects of novel-reading in the latter part of the century. Just as Charles Dickens and Wilkie Collins sought to define themselves against the productivist values of mid-Victorian culture, Eliot was led to a similar project through the terms and tropes of organic breakdown. While conceding the artifactual status of art—namely, its special distinction from the lived realities of its time--Eliot also endeavored to show how fiction could continue to circulate incalculably in history, and to influence society in indeterminate and unending ways.

By emphasizing the powerfully generative outcomes of thermodynamics in Eliot's milieu, this chapter brings a counterintuitive perspective to bear upon physics's

cultural impact. Usually invoked as a theory of cosmic disaggregation and decay--equated roughly with *fin de siècle* pessimism and ennui--critics have tended to obscure its salutary initial response at mid-century. Far from exacerbating new forms of nihilism, energy science inspired palpable enthusiasm among Victorian audiences. Paradoxically, the discovery of cosmic depletion became a new inspiration for imagining British cultural progress. such dispersion takes place as a principle of narrative value in *Middlemarch*—expressing at once the inefficacy of art and its endless effects in society. If surplus feeling remains restricted at the level of character and plot, as we shall see, it becomes all the more viable in the ethics and aesthetics of fiction itself. For, Eliot attempted to liberate art from personal politics and the crass commercialism of the market while, at the same time, she suggested how literature could improve our world. In her model of surplus feeling, fiction occupies a position at once inside and outside of politics, at the same time typifying and transcending the lived experience of nineteenth-century life.

I. Conservation and Decline: Eliot and Energy Science

Like many Victorian novelists, George Eliot wrote often on the theme of emotional loss: all of her novels explore the effects of ardor which is misdirected, defeated by convention, or simply mastered by material need. Far from an isolated preoccupation, this pattern permeates her novels and constitutes an overarching dynamic of desire. As just one example, Maggie Tulliver enacts a pattern of unrenumerative expenditure which links her longstanding love for her brother Tom and her brief infatuation with Stephen Guest, whereby she is "perversely brought to destroy all her opportunities for renewal," as Elaine Showalter puts it.[112] Not only dramatizing the decline of enthusiasm, Eliot's fiction centers upon the continuing effects of feeling which has lost its way--sidetracked away from the immediate actions of individuals and their society.

Accordingly, Eliot's interest in defeated desire has formed a central axis for recent historicist approaches. By situating Eliot within the political and epistemological contexts of nineteenth-century culture, formative readings by critics such as Nancy Armstrong and D.A. Miller have provided enormous interpretive insight, particularly by theorizing the novel's participation in new class and gender-differentiated subjectivities. These critical models identify a form of affective regimen at play in Eliot's fiction, an insidious incitement to self-discipline--the "surrender of desire or its reductive rescaling," or "the operations of division and self-containment."[113] As they argue, Eliot invokes exceptional feeling only to admonish her enthusiasts in favor of the more modest pleasures of acculturation. She offers a bourgeois selfhood at once uncoupled from politics but also central to the new stratifications of nineteenth-century British society.

These readings provide exemplary accounts of how Eliot's novels inaugurate new forms of subjectivity and social relations; however, the novels' representations of emotional decline are almost always conceived as *symptoms* of coercion--either as cautionary tales about the perils of nonconformity, or (much the same) as compensatory fantasies of some purely fractional, uncompleted passion. On the one hand, her novels appear as normative and normalizing allegories of community, which endorse the wisdom of the given order of things by displaying the devastation of all that contradicts it. On the other hand (and in conjunction with this reading), her novels articulate fantasies of resistance that can never be coherently realized: Dinah Morris's abdication from preaching and Felix Holt's withdrawal from politics stand as synechdoches of how Eliot's narratives imagine passionate feeling only to defuse it, making prodigal impulses merely the prelude to a preferred orthodoxy.

In either case, however, such structures of feeling can signify only as something other than themselves, as signs of a larger pattern of cultural repression. It seems self-evident that Eliot's novels dramatize the fact that passionate feeling is untenable within contemporary culture. Even the most exceptional impulses, Eliot tells us time and again, are untranscendent and finite in

that they tend to decline within their social medium. But it is less evident that her novels thus take part in the emergence of new disciplinary structures in any seamless sense. Far from characterizing the comprehensive reach of Victorian social controls, these tendencies could suggest a kind of negative agency: a form of influence defined in terms of its very unproductivity and disavowal of any appeal to action.[114] Not so much a "*reductive* rescaling" of desire (Miller 149)--the emotional atrophy of an incipient middle-class—surplus feeling suggests something quite to the contrary: the re-location of meaning apart from the exchanges of individual subjects. Ultimately, by suggesting the insufficiency of individual viewpoints—the tendencies toward dispersion and disaggregation in a realistic narrative--Eliot came to a further realization: how the non-productive pleasures of literature could contribute to "the growing good of the world" (*Middlemarch* 825).

Eliot's interest in energy science took shape notably over the course of her career. Besides her exposure to the outpouring of articles and essays in the popular periodical press from the mid-1850s onward, Eliot read and owned influential works by William Grove and Hermann von Helmholtz (whom she met briefly in her travels to Germany during the 1850s). These texts provided a set of terms and tropes that suffused her fiction, and offered an important touchstone for her new interests in thermodynamics in the later 1860s. Her reading list for 1868 – 1871, the years of *Middlemarch's* inception, reflects a remarkably focused interest in contemporary thermodynamics. Grove and Helmholtz feature prominently, and Eliot describes rereading Grove "with renewed interest, after the lapse of years" in an unpublished diary entry from May 1870.[115] But the list also includes an essay on Lucretius's atomic theory, Bence Jones's recent *Life and Letters of Faraday* (1870), and John Tyndall's influential *Fragments of Science for Unscientific People* (1871).[116] These were important and carefully selected works, all of which placed

thermodynamics within a specific set of epistemological and ontological concerns. "All I wish to point out," Faraday insisted, "is, by a reference to light, heat, electricity, &c., and the opinions formed on them, the necessity of cautious and slow decision on philosophical points, the care with which evidence ought to be admitted, and the continual guard against philosophical prejudices which should be preserved in the mind."[117] Scientific subjects call for a "philosophical" approach, a lens like any other social concern. Problems of perspective and personal "prejudices" are always bound up in the act of observation. Together, these texts express a vigorous return to Eliot's earlier interests in energy science, now emphasizing the conceptual emergence of thermodynamics over the two previous decades.

Although energy conservation formed single idea, it was predicated upon two separate and seemingly contradictory principles. The first law of thermodynamics argued that the amount of energy in a system is always the same: in the case of either a simple steam engine or the entire cosmos, energy is never gained nor lost (this was the eponymous law of *conservation*). The first law suggested that energy remained constant through many different transformations; manifesting variously as heat, light, electricity, or electromagnetism, energy is immutable throughout the universe. In any of its forms, energy could be measured quantifiably in terms of physical "work." The mathematical concept of work, in particular, captured the clear disjunction between classical eighteenth-century mechanics and thermodynamics: scientists could now show in explicit terms that energy remained constant in different manifestations, and they could measure these transformations mathematically.

The second law which underwrote the theory of energy conservation was that entropy tends towards a maximum (the law of universal *dissipation*). Demonstrating that the energy in a given system always tends to decline, physicists also showed that the cosmic mechanism itself was gradually running down. The upshot of this idea was that, even though energy is never destroyed, it becomes incapable of being measured and manipulated for work: continuing to exist in perpetuity, it merely moves into increasingly imperceptible channels. While the first law of thermodynamics suggested energy's permanence in a variety of forms, the second law added the caveat that energy loses its capacity to perform work over time: energy is lost or "dissipated" as radiant heat, and cannot be re-channeled into productive action without the addition of external resources. While energy is constantly being lost as "waste," it continues to persist *as* energy—it merely moves into unlocalized avenues of action.

Taken as a whole, the theory of energy conservation suggested a new natural economy, a circuit of value in which "waste" and "energy" were fused together. Whereas classical Newtonian mechanics had ascribed to Providence a kind of ongoing replenishment of mechanical resources, mid-nineteenth-century science argued for an entirely immanent reality in which "unproductive" energy accumulates continually, ubiquitously, and inexorably. At the same time, the sense of cosmic impermanence suggested by thermodynamics was remarkably muted in the mid-1850s and 1860s. While acknowledging the ultimate apotheosis of life over the *long durée*, writers at mid-century were more willing to latch onto its enabling and emancipatory outcomes. It is not so much that the larger effects of dissipation were somehow incomprehensible, but rather that they were assimilated through the generally optimistic sentiment which pervaded the

period in the aftermath of the hungry forties, the defeat of Chartist radicalism, and a new celebration of incremental progress.

For its initial audiences, thermodynamics asserted that life was no longer limited to the confines of the body, but *traces* of vitality suffused the world in a variety of contexts. Even as energy is lost to productive forms of work—in the fading powers of a galvanic battery, a heat engine, a plant organism, or a human body--it continues to persist in immeasurable forms of influence. As Grove commented, "the effort we have made pervades and shakes the universe; nor can we present to the mind any exercise of force, which is thus not permanent in its dynamical effects."[118] Rather than enshrining the body as a special locus of subjectivity, thermodynamics located it within a general economy of energy relations—a universal network of transfers, exchanges, gains, and losses, indicating a form of value traceable ultimately to the heat of the sun. The inspired energy of individual "effort" proceeds outwards from the self and carries an illimitable range of effects. Not simply a deterministic law of decline, thermodynamics suggested the irrepressible animation of the universe at large**.**

Scientists were quick to translate these theories into other cultural contexts. In a lay treatise on *The Conservation of Energy* (1873) the physicist Balfour Stewart observed, "Very often we know little or nothing of individuals, while we yet posses a definite knowledge of the laws which regulate communities. [...] Nor is our knowledge of individuals greater in the domains of physical science. We know nothing, or next to nothing, of the ultimate structure and properties of matter, whether organic or inorganic" (1-2). Physics fails to resolve upon an individualizing viewpoint; for Stewart, particular properties and structures are alien to its account of the world. But such shortcomings are

offset by its greater veracity as "a very good instance of that kind of generalization which we may arrive at, even in spite of our ignorance of individuals" (11). While thermodynamics cannot account fully for single, isolated "individuals," for this very reason it offers a more inclusive vision of the "community."

As the example of Stewart suggests, over the course of the late 1860's and early 1870's, findings within thermodynamics turned increasingly upon the nature of the individual exception. Specifically, scientists began to question physics's capacity to account for deviations from the law of diffusion--the *individual* instances of energy that contravened the general principle of decline. As Eliot's London acquaintance James Clerk Maxwell wrote, "the motions and displacements which are concerned in the communication of heat are those of molecules, and are so numerous, so small individually, and so irregular in their distribution, that they quite escape all our methods of observation" (2: 669). In a series of private letters, journal articles, and lectures between 1866 and 1871, culminating in his seminal *Theory of Heat* (1871), Eliot's Maxwell showed that the law of entropy was premised upon the motions of a huge number of particles, and could never be proven as an absolute fact of dynamics. Developing from his own statistical theory of gases (in which gaseous particles were shown to behave in inherently random and unpredictable ways), Maxwell showed that, under certain circumstances, it was possible to imagine circumstances in which individual particles actually contradicted the law of entropy.[119] Paradoxically enough, irreversibility was a contingent concept.

Maxwell presented his findings to a lay audience through an ingenious thought-experiment, in what came to be one of the most celebrated conceptual arguments in the

history of science: he imagined a "finite being" or "demon" (as it came to be called) existing at the molecular level, which controlled a doorway between a warm body and colder body. This being could observe the random motions and velocities of individual molecules, selectively choosing them so that slower ones could pass back into the warmer system, and vice versa. The result of this process, Maxwell pointed out, would be that "the hot system has got hotter and the cold colder and yet no work has been done, only the intelligence of a very observant and neat-fingered being has been employed."[120] While the subject of widespread initial debate, Maxwell's argument found increasingly general acceptance. Stewart and Tait would allude to it in expansive terms--albeit without Maxwell's undertone of irony—in *The Unseen Universe*: "by enlisting in our service conceivable finite beings (imagined by Clerk-Maxwell, and called demons by Thompson), it would be possible materially to alter this state of things, even though these beings should do absolutely no work" (124). Although such processes were "exceedingly improbable," colleagues like Ernest Boltzmann soon conceded, they were nevertheless "not impossible."[121]

In the same period of time that Eliot was reading from Grove's *Correlation of the Physical Forces* that our most isolated actions "pervade and shake" the world in an endless profusion of effects, scientists like Maxwell were pointing out that the principles of energy were inconsistent with any individualizing perspective. Eliot was acquaintanced with Maxwell and had regular contact with him during these years, and it is very likely that she would have heard of his undertakings directly, or else from important London friends like Clifford and Tyndall. Without doubt, Maxwell's argument actually underscored the explicit epistemological and ontological claims of physics:

vitality was a potential detached from the decline of individual "molecules," and the possibility for animation continued beyond the cessation of vital activity itself. Maxwell's more important intervention had to do with the representational claims of energy science, and with the particular way in which his argument focused the relationship between representation and the role of the observer.

There were several outcomes of the "demon paradox" which would resonate with Eliot. Explicitly, Maxwell suggested that enervation—not enduring constancy—was the more pressing issue in the representation of energy. And along these lines, Maxwell imagined a perfectly detached observer of "universal regular sequences" who attended to the minutiae of individual actions, rather than to large-scale historical outcomes; as in Eliot's conception of natural history, the truest representation will begin with particular instances of behavior, and follow the unpredictable arc of their effects. But perhaps most significantly, the demon suggested a resplendent model of intellectual labor itself, in which no energy is required or expended in the sorting activity: the work of mental sifting is freed from the ordinary laws of physical expenditure. Devoted entirely to individual deviations, the demon itself embodies an even more singular exception to the logic of decline. Observation is equated with a kind of all-powerful posture of detachment: a luminous and endlessly lucid ideal of intelligence, which at once participates in the movements of molecules and yet remains perpetually removed from their laws of limitation. ("These beings should do no work," as Stewart and Tait observed (125).) This is the underlying first premise of Maxwell's model: an analysis of the individual exception depends upon an anomalous detachment from the ordinary laws of expenditure.

However suggestive as a fantasy of literary labor, Eliot proceeded to respond to Maxwell's model precisely at this point. Rather than embracing the observer's total isolation from the natural economy, diffusion in *Middlemarch* becomes a basic paradigm for perception itself: entropic decline is internalized as a principle of narrative development, in the gradual expansion of perspectives inherent to the form of the multiplot novel. That is, the narrator itself is linked with the tendency towards decline which it attempts to observe in particular individuals. This fact accounts in part for the peculiar double emphasis of *Middlemarch*: while it is clearly interested in those "exceptional" instances that resist the downward direction of nature, it emphasizes constantly the continuing value of energy which is *not* re-converted.

Even as it foregrounds the importance of the individual deviation in this manner, the novel turns to a radically post-individualist model of social influence. Rather than celebrating sympathy as a kind of endlessly productive resource, the novel emphasizes the prodigal and apparently unproductive actions of her protagonists: "the growing good of the world" takes place precisely through the development of diffusion. This emphasis is vitally apparent in Eliot's later fiction. Embarking self-consciously upon a new stage of her career in the late 1860s, Eliot was prepared to acknowledge the imperfections of her earlier, more confident convictions for a more trenchant approach to culture. Far from legislating the values of organic interdependence, Eliot saw that a community could be close-fisted, capricious, and generally disagreeable. Moreover, the power of sympathetic feeling--once seen to foreshadow a consummately reformed future--was exposed as fugitive and ephemeral: passion and fellow feeling were, as it turned out, as evanescent as organic life itself. How could such impulses be sustained in a world of illimitable loss? I

argue that Eliot turned to energy science to find a solution to this imaginative impasse. Precisely by embracing its singular conception of waste, she found the conditions of possibility for a renewed social and moral philosophy. As her friend Tyndall wrote in 1865, "The mode of motion changes, but the motion continues."[122]

II. Diffusion as Development in *Middlemarch*

Nearly every major character in *Middlemarch* loses energy, in the sense of an increasing disproportion between their actions and the results they achieve. In the slippage between inspiration and accomplishment, Eliot's characters enact the order of an inefficient universe--a world moving towards total decay. Only isolated anomalies such as Farebrother and psychologically-limited figures such as Fred Vincy and Mary Garth escape this fate. It seems self-evident why this is the case for Eliot's egoists (namely, Edward Casaubon, Featherstone, Rosamond Vincy, and Bulstrode): whether expended in jealousy or revenge, or squandered in scrupulous isolation, the self-directed impulses of these characters cannot be sustained in perpetuity. But it is less obvious why the narrative imparts a similar logic of depletion to its more celebrated characters, Dorothea Brooke and Tertius Lydgate, who undergo analogous experiences of wasted effort. Conventionally, of course, this can be explained in terms of the novel's need to punish and rebuke the desire for transcendence: in their efforts to exceed the realities of their world, Dorothea and Lydgate are enslaved to them. But in another sense, in *Middlemarch* the fact of emotional decline appears almost as a psychological starting point, a condition which governs the logic of subjectivity itself. Personal energy is circumscribed in contemporary culture, and the nature of the self is determined by the particular forms of expenditure that one's energy assumes.

The downward direction of energy, dissipation, becomes an organizing problem in the Prelude. In particular, it is underscored by the example of St. Theresa, whose vitality is associated with an older ideal of "fuel" (that is, "material for burning, combustible matter as used in fires," *OED n.*1a). While emphasizing the difference between Theresa's social circumstances and those in the nineteenth century, the narrator articulates the distinction in terms of their respective natural economies, and, in particular, the new ideal of limitation that the nineteenth century has produced. "[Theresa's] flame quickly burned up that light fuel; and, fed from within, soared after some illimitable satisfaction, some object which would never justify weariness, which would reconcile self-despair with the rapturous consciousness of life beyond self" (3). The extended sequence of clauses neatly encapsulates the epic that *Middlemarch* cannot tell: Theresa's "flame" spent its early sources of fuel; this flame "feeds" from her own self-generated resources; finally, it conquers "weariness" itself. In St. Theresa's story, energy provides its own magical solution to the problem of enervation. Her "fuel" can be used to overcome its very exhaustion. But nineteenth-century society will not facilitate such strategies for Dorothea, whose powers are finite and cannot be replenished from within. In the language of physics, diffusion cannot be reversed without the addition of work from outside the system. As the narrator comments, "here and there [will be] born [...] a foundress of nothing, whose loving heart-beats and sobs after an unattained goodness tremble off and are dispersed among hindrances, instead of centering in some long-recognizable deed" (4). Whereas her precursor's "passionate, ideal nature demanded an epic life," for Dorothea there can be "no epic life wherein there was a constant unfolding of far-resonant action" (3). Departing from the conditions of epic possibility,

Eliot's novel will focus on the problem of "dispers[al]," of futile actions that do not register in conventional histories.

Pitting an ideal "constant unfolding" action against the potential for endless "dispers[ion]," the Prelude presents two antithetical possibilities for Dorothea's narrative: will her life achieve epic stature, or will its energies merely scatter and decline? The question is all the more pressing since readers know from the beginning that epic stature is impossible. In fact, Eliot's novel resolves this question by reconciling its opposing implications. Turning to the new concepts of thermodynamics, *Middlemarch* forges a connection between "constant unfolding" action and the dispersive nature of surplus energy—it seeks to locate a new form of value in the very limitations of contemporary life. The novel marks this movement in the shift from "dispersion" in the Prelude to "incalculable diffusive" influence in the Finale. As the narrative advances, wasted ardor becomes a condition for the upward progress of nineteenth-century society.

The open secret of Dorothea's marriage—what everyone *except* Dorothea knows--is her husband's enervation. In her new connubial life, Dorothea believes, at first, that "[s]he was going to have room for the energies which stirred uneasily under the dimness and pressure of her own ignorance…. Now she would be able to devote herself to large yet definite duties" (44). These duties promise to focus her feeling in particular channels: "to Dorothea, Mr. Casaubon had been the occasion which had set alight the fine inflammable material of her youthful illusions" (84). Yet, far from being "the book that," Dorothea believes, "will make your vast knowledge useful to the world" (200), Casaubon's Key to all Mythologies is an embodiment of unproductive activity, so that his learning and labors are revealed as futile. Casaubon's condition is drawn explicitly from

energy science:

> He did not confess to himself […] his surprise that though he had won [Dorothea]…he had not won delight […]. It is true that he knew all the classical passages implying the contrary; but knowing classical passages, we find, is a mode of motion, which explains why they leave so little extra force for their personal application. (85)

The passage resonates with Tyndall's *Heat: a Mode of Motion* (1868); indeed, it was part of the common parlance of physics. "The fact is, I believe," the British scientist William Thomson observed, "that work is lost to man irrecoverably; but not lost in the material world."[123] Physicists had made the point that energy consists of a finite quantity of matter in motion (appearing as heat, light, electricity, or electromagnetism): energy can be employed in active "work" or diffused as radiant heat, but cannot be maintained indefinitely. Thus Casaubon's knowledge has "little extra force for…personal application." He cannot "feed from internal sources" in the manner of St. Theresa, either. As the narrator elaborates:

> [Casaubon's frame] was too languid to thrill out of self-consciousness into passionate delight; it went on fluttering in the swampy ground where it was hatched [...] [I]t was that profound narrow sensitiveness which has not mass enough to spare for transformation into sympathy, and quivers thread-like in small currents of self-preoccupation or at best of an egoistic scrupulosity. (279)

Casaubon lacks the requisite "mass to convert languor into "passionate delight." He embodies so much inert energy: his feeling simply quivers "thread-like in small currents." Poised on the edge of analogy, the prose points to the rhetoric of science—seen in scientists' emphasis on oscillations, vibrations, and matter in motion—while resting squarely in the conventions of narrative exposition. Casaubon's energy cannot "thrill out," and thus it "flutter[s]" and "quivers," but it is never destroyed: it merely moves to less perceptible channels over time. "The mode of motion changes," Tyndall wrote, "but

the motion continues." As it turns out, Casaubon's energies do continue after his death--both in his prohibitive codicil, designed to keep Dorothea from marrying Will Ladislaw, and in his injunction for her to carry on his research. If these acts appear to drain Dorothea's ardor, they also become an indirect impetus in the ending—what helps her to alleviate Lydgate's financial difficulties and to achieve a new, "selfless" form of sympathy in the nineteenth century.

Instead of focusing her ardor into productive channels, Dorothea's marriage is experienced as a form of emotional attenuation: she learns that feeling is finite and subject to decline. After Lydgate diagnoses her husband's fatal condition, in chapter twenty-three, the narrator comments, "she hesitated, fearing to offend him by obtruding herself; for her ardor, continually repulsed, served with her intense memory, to heighten her dread, as thwarted energy subsides into a shudder" (425). The image of obstruction neatly encapsulates the sense of cleavage in the marriage: "thwarted" energy is energy that fails to find productive avenues. (It is "dispersed among hindrances" (4).) Since it cannot be maintained, such energy "subsides into a shudder," and cannot be re-channeled. "Friction," as Balfour-Stewart wrote in 1873, "will prove itself to be, not the destroyer of energy, but merely the converter of it into some less apparent and perhaps less useful form."[124] Eliot uses the rhetoric of energy to indicate a sense of implacable distance despite the close physical proximity of her characters. Far from focusing her passion into productive avenues, the marriage images a portrait of emotional loss. Eliot has turned the second law of thermodynamics into a figure for social relationship, a way of expressing the failure of sympathetic bonds.

What drives the narrative dynamic of Dorothea's story, then, is not so much the

question of whether passionate feeling can be sustained, but rather what happens after it is *lost.* For while her energies are squandered, they are not annihilated:

> Dorothea's ideas and resolves seemed like melting ice floating lost in the warm flood of which they had been but another form. She was humiliated to find herself a mere victim of feeling, as if she could know nothing except through that medium: all her strength was scattered in fits of agitation [...] and then again in visions of complete renunciation, transforming all hard conditions into duty. (198)

Rather than resolving into a specific task, Dorothea's ambitions end in the dispersal of form--a dispersion that develops into an entire "medium" of experience. As the narrator comments, in Dorothea's final moments with Casaubon: "She sat listening…with a dumb inward cry for help to bear this nightmare of a life in which every energy was arrested by dread" (374). Even though her energy is "arrested," it is all the more palpable as a generalized anxiety: "[Dorothea's] excessive feeling manifested would alone have been highly disturbing to Mr. Casaubon" (200). Despite the fact that Dorothea's "excess" feeling is estranged from her ("arrested by dread"), it is not absented from the social medium, but continues to impact others around her. Dorothea's feeling is not destroyed but merely transformed into a less perceptible form which has a powerful effect on Casaubon.

The dispersion of form, in Dorothea's narrative, extends to the structure of *Middlemarch* itself—a problem of content that it addresses through the logic of its development. In the gradual broadening of perspectives beyond Dorothea after chapter eleven, the novel envisions a kind of progressive dissemination of narrative energy, and finds in physics an image of its own progress. Ultimately, as we shall see, the narrator's perspective actually does move outside the web of Middlemarch (and *Middlemarch*). Except for Farebrother, Fred Vincy, and Mary Garth, every main character leaves the

community. But the novel recasts the fear of "dispers[ion]" itself along the way to this conclusion, so that it becomes consistent with sympathy itself. In particular, to address the issues of surplus feeling that the novel introduces in Dorothea's narrative, it traces the "determining energy" of its other main protagonist, Tertius Lydgate.

III. "Ethereal Atoms" and the Victorian Social Imaginary

As Eliot's only major character engaged in experimental discovery, Lydgate appears as a central figure in studies of nineteenth-century science, often seen in light of the rise of medical and biological discourses.[125] Yet, while his vocational ambitions are associated with the reform of English pathology, the novel is equally interested in examining the *limits* of bodily knowledge—in putting the body within a general field of energy conversions. Critics have often read Lydgate's story against the advancement of the biological disciplines, but it is significant that both his personal relationships and his actual intuitions about the "primary tissue" are expressed through the rhetoric of energy science. The novel curiously and consistently aligns Lydgate with an intuitive insight into "ethereal atoms"--a notion which was amenable to materialist physiology but which transcended its boundaries. Crucially, it establishes a correspondence between his scientific inquiries and his experiences in the milieu of Middlemarch itself: in the convergence of scientific theories and personal experience, Lydgate's circumstances come to exemplify the very ideas for which he searches.

As with its depiction of Dorothea, the novel identifies Lydgate with an ardor that exceeds the average mean of Middlemarch, and which causes his energies to strain against its "hampering threadlike pressures." Introducing Lydgate in chapter 11, the narrator comments:

> Among our valued friends is there not someone or other who is a little too self-confident and disdainful; whose distinguished mind is a little spotted with commonness…whose better energies are liable to lapse down the wrong channel under the influence of transient solicitations? All these things might be alleged against Lydgate […]. (149)

Like Dorothea's "Puritan energy" (8), Lydgate's energies are threatened by transience—the possibility of "laps[ing] down the wrong channel." But whereas these tendencies are instantiated at the level of theme and formal exposition in Dorothea's narrative, Lydgate's story localizes them in the actual pursuit of experimental knowledge. The great irony of Lydgate's story lies in the way in which his intimations about the energy of "ethereal atoms" are exhibited in his social experience, but exceed his own understanding. His "diffusive" medium—brought on by a premature marriage to the wrong person--fails to culminate in the discovery of diffusion. That is to say that the lapsing of Lydgate's energies is both the occasion for knowledge (insight into the "diffusive influence" of molecules) and an ultimate outcome of his failure (an inability to complete his quest for the primary tissue). Unable to scrutinize his life, Lydgate is also incapable of observing "the last refinement of inward energy."

Middlemarch associates Lydgate with "the limit of anatomical analysis" (148), an idea underscored by his intellectual allegiances. Reflecting upon his hero Bichat, Lydgate muses:

> That great Frenchman first carried out the conception that living bodies, fundamentally considered, are not associations of organs, but must be regarded as consisting of certain primary webs or tissues, out of which the various organs […] are compacted, as the various accommodations of a house are built up in various proportion of wood, iron, stone, zinc, and the rest, each material having its peculiar composition and proportions. (148)

Bichat, contemporaries believed, was on the verge of discovering an atomic substratum linking all reality--a forerunner to physics as much as molecular biology.[126] Like many

pioneers of energy conservation (foremost among them Helmholtz and English scientists like Tyndall and James Joule), he framed his work as an attempt to trace the "forces" in organic bodies, and found inspiration in Isaac Newton's analysis of the primary principles of the world.[127] Challenging the very the boundary between organic and inorganic nature, Lydgate's narrative associates him with a physiological analysis of force highly resonant among mid-Victorians. "The more he became interested in special questions of disease," the narrator notes, "the more keenly he felt the need for that fundamental knowledge of structure which just at the beginning of the century had been illuminated by [Bichat]" (147).

If the novel associates Lydgate's experimental notions with subsequent ideas of energy, it also describes his mental patterns along these lines. In Lydgate's often-quoted scene alone in his study, the narrator comments upon his mental constitution as

> [an] imagination that reveals subtle actions inaccessible by any sort of lens, but tracked in that outer darkness through long pathways of necessary sequence by the inward light which is the last refinement of Energy, capable of bathing even the ethereal atoms in its ideally illuminated space [...]. [H]e wanted to pierce the obscurity of those minute processes which prepare human misery and joy, those invisible thoroughfares […]. (164-165)

As Selma B. Brody has observed, "This is a physicist's reverie, not a physician's" (48). Indeed, the imagery of thermodynamics abounds in the passage; it points in particular to Tyndall's *Fragments*, which Eliot had been reading at this time.[128] The "ethereal atoms" indicate the ultimate objects of knowledge which science can intimate: Lydgate's concerns are not with the infinitely hard, destructible atoms of eighteenth-century science, but with *ethereal* matter. As physicists argued, the world is constituted by a total vacuum of energy, or ether, and all action transpires through transfers of energies within this field. In Tyndall's terms, "[w]e on the earth's surface live night and day in the midst

of ethereal commotion. The medium is never still."[129] The principle of "ether" embodied the idea that our world consists of a universal medium of energy relations, in which energy can assume measurable manifestations, but can also be dissipated as radiant heat. The goal of Lydgate's research is not a particular material substance, but rather their "last refinement"--the "minute processes," and "invisible thoroughfares" of atoms.

Lydgate's musings upon the "ethereal" medium thus correspond with the *social* medium in *Middlemarch*. Society is a fluid continuum of transfers and exchanges of force, and individuals are constituted ineluctably through this all-pervasive atmosphere. Indeed, Lydgate's downfall is conceived explicitly in terms of his scattered energies: in his disintegrating marriage, Rosamond Vincy absorbs his "best energies," demonstrating their "lapsing" down the wrong channel. The concepts of thermodynamics are thus brought to bear upon Rosamond's gradual and irrevocable depletion of Lydgate's "energy":

> [...] the terribly inflexible relation of marriage had lost its charm of encouraging delightful dreams. The Lydgate with whom she had been in love had been a group of airy conditions for her, most of which had disappeared, while their place had been taken by everyday details which must be lived through slowly from hour to hour, not floated through with a rapid selection of favorable aspects. (661)

The "airy conditions" of Rosamond's attraction recasts Lydgate's "ethereal" intimations about the natural medium: "He had no longer free energy enough for spontaneous research and speculative thinking" (668). In place of the constant transformations of their earlier relationship (defined by a "rapid selection of favorable aspects"), the marriage flutters in the slow grind of the mundane. Emotionally depleted, he has no energy to contemplate the nature of diffusion itself. Lydgate's tragic error lies in his inability to apply his scientific standards of observation to his own private circumstances: his

"scattered energies" actually *exemplify* the patterns of diffusion that elude him.

The double logic of diffusion in Lydgate's narrative—its significance as both a metaphor of personal decline and as an actual embodiment of his scientific failure--becomes an explicit theme in chapter sixty-four. Centering upon Lydgate's "wasted energy and…degrading preoccupation," the chapter dramatizes Rosamond's climactic departure from the Lydgate household. The epigraph announces its explicit concern with the operations of "force":

> Power is relative; you cannot fright
> …all force is twain in one: cause is not cause
> unless effect be there; and action's self
> must need contain a passive.
> So command exists but with obedience (647).

Specifically, the lines elaborate upon Newton's older, anachronistic third law of motion. For every action, Newton hypothesized, there is an antithetical consequence (or reaction): "cause is not cause/ Unless effect be there." The epigraph employs this concept to suggest the circumstances which subtend Lydgate's circumscribed "power": energy which is lost in one direction is taken up elsewhere, namely by Rosamond. However, the chapter then moves beyond the older, Newtonian ideal to emphasize that energies are never transferred or re-allocated perfectly. The energy which Lydgate loses is wasted irrevocably, and cannot be regained again. "Lydgate," the narrator writes, "was paralyzed by opposing impulses: since no reasoning he could apply to Rosamond seemed likely to conquer her assent, he wanted to smash and grind some object on which he could at least reproduce an impression" (660). Rather than a perfect exchange of power, a trace of "wasted" energy remains: "Lydgate was now a prey to that worst irritation which arises not simply from annoyance but from the second consciousness underlying those

annoyances, of wasted energy and a degrading preoccupation, which was the reverse of all his former purposes" (647). The point is elaborated subsequently in the chapter:

> Rosamond's quiet elusive obstinacy would not allow any assertion of power to be final; and again, she had touched him in a spot of keenest feeling [...] the very resolution which he had wrought himself to was relaxing under her torpedo contact [...]. (660)

On the path to greatness, Lydgate's ardor has been diverted to "wasted energy"—it has been depleted as a kind of radiant heat "with little force for personal deployment." As the narrator comments, "it was the sense that there was a grand existence in thought and effective action lying around him while his self was being narrowed into the miserable isolation of egoistic fears" (648). Like Casaubon's knowledge, his medical inquiries have turned into a "dried preparation." In failing to apprehend the logic of diffusion, Lydgate has become determined by it.

This new sense of irreversible loss organizes his connection with Rosamond in the chapter: "[s]uch was the force of poor Rosamond's tactics now she applied them to affairs" (658). The narrator writes:

> We are not obliged to identify our own acts according to a strict classification any more than the materials of our grocery and clothes [...] [A]s for him, the need of accommodating himself to her nature which was inflexible in proportion to its negations held him with pincers. He had begun to have an alarmed foresight of her irrevocable loss of love for him (666).

Like his "fair unconquered," the primary tissue, his relationship with Rosamond resists any strict classification between human energy and inorganic objects ("the materials of our grocery and clothes"). But what the passage emphasizes is his intimation of irrecoverable energy. Although Lydgate fails to discover the diffusive nature of "ethereal atoms," he gains foresight of "irrevocable loss" in his own lived experience. Lydgate's

experience of irreversible depletion, in this manner, extends beyond the immediate outcomes of the chapter and expresses his own ultimate fate in leaving Middlemarch. As Lydgate recognizes, "the first great disappointment had been borne: [...] [his] ideal wife must be renounced and life taken upon on a lower stage of expectation" (652).

In Lydgate, Eliot expresses a specific logic of enervation in nineteenth-century energy science, whereby energy is defined by the very inevitability of its loss. In conjunction with Dorothea, the dramatic tension in Lydgate's story centers around the question of what happens *after* energy is diffused. The tragic dimension of Lydgate's life, in this sense, does not lie in the isolated fact that his ardor declines, but that such decline fails to result any generative knowledge or social outcomes. He is "shapen after the mean" without any salutary consequences in society.

Although Lydgate is subject to the universal tendency towards emotional decline, his narrative points out the continuing potential for deviation from this teleology. Exceptional individuals might resist the pull of diffusion and actually regain ardor: precisely by ascertaining his own "diffusive" circumstances, that is, Lydgate might reverse the downward direction of his scientific ambitions. Indeed, this possibility for deviation was articulated by contemporary scientists such as Maxwell, as we have seen, in the years immediately surrounding *Middlemarch*'s publication. The novel alludes to these experimental contexts at a crucial juncture in Book Seven, in Rosamond's entreaties to leave for London:

> If his energy could have borne down that check, he might still have wrought on Rosamond's vision and will. We cannot be sure that any natures, however inflexible or peculiar, will resist this effect from a more massive being than their own. They may be taken by storm and for the moment converted, becoming part of the soul which enwraps them in the

> ardor of its movement. But poor Lydgate had a throbbing pain within him, and his energy had fallen short of its task [...]. (752)

The passage marks the novel's most explicit allusion to Maxwell's findings. As Maxwell argued, individually "diffusive" molecules might actually resist the general trajectory toward depletion. Rather than continue to lose vitality, exceptional molecules might be converted back into productive channels of work. "Irreversibility," in this way, was predicated upon a singularly reversible logic of progression, simultaneously suggesting a resigned fatalism and a more recuperative contingency. Given the inherently random and anomalous action of particles, exceptional individuals might contradict the general pattern: once scrupulously observed, individual examples of "excess" energy could be shown to deviate from the general order of things, and "resist th[e] effect" of universal entropy. As Eliot's narrator notes, Lydgate's "energy" has the potential to resist the tendency towards decline. It could be "for the moment converted" back into productive channels, and put in the service of individual applications again. Notably, the passage integrates the rhetoric of thermodynamics—with its emphasis on the "conversion" and the motion or "movement" of energy—alongside the human "ardor" that pervades the social medium: "they may be taken by storm and for the moment converted, becoming part of the source which enwraps them in the ardor of its movement." Eliot is saying that Lydgate's "lapsed" energies are not absolutely decisive or determining; although a majority of individuals (what Maxwell called "the statistical mean or group") are subject to the law of dissipation, it is possible that Lydgate might convert his energies back into active channels.

Of course, Lydgate fails to reform his energies in the end. For the remainder of his life, he "had no longer free energy enough for spontaneous research and speculative

thinking." Unlike St. Theresa, whose sources of "fuel" can be replenished from within, "his energy had fallen short of its task." Ultimately, Lydgate conforms to the general laws of probability upon which energy science expresses reality: Lydgate is "shapen after the mean." But by the same token, Lydgate's lost energy still inspires the union between Dorothea and Ladislaw; his defeated desires continue to impact a range of others. The chain of action is notoriously circuitous. First, Dorothea asks Lydgate to call at Lowick, her fascination piqued by "an awakening conjecture as to what Lydgate's marriage might be to him." Learning of his condition, Dorothea offers to intercede on his behalf. Importantly, what impels Dorothea is his "wasted energy" itself. In turn, this leads to her discovery of Rosamond and Ladislaw together; to her new resolve to act on Lydgate's behalf in spite of her own attachments; and, finally, to Rosamond's confession of Ladislaw's love for Dorothea. The narrator comments:

> All the active thought with which she had before been representing to herself the trials of Lydgate's lot, and this young marriage union which, like her own, seemed to have its hidden as well as evident troubles—all this vivid sympathetic experience returned to her now as a power [...]. She said to her own irremediable grief, that it should make her more helpful, instead of driving her back from effort. (788)

Lydgate's stifled energies are the condition for Dorothea's new "power" and "vivid sympathetic experience." It is not so much that Dorothea absorbs or assimilates his energies; her "irremediable grief" has not been reversed by Lydgate's influence. Rather, that influence becomes a new compulsion to her own selfless "effort." Even as it is framed as a scene of sympathetic recognition, this experience is not defined by an act of exchange. Instead of an intense identification between Dorothea and Rosamond, their bond is inherently ephemeral. The two are speaking at cross purposes, so that the scene stages the very absence of a perfect sympathy. But despite the slippage between

individuals—indeed, because of it—such feeling has "power[ful]" effects, and points to the possibility of "life beyond self" (3).

As an *indirect* consequence of Lydgate's influence, Dorothea does regain "energy." Indeed, what seems to distinguish Eliot's two main protagonists is that they provide alternative examples of Maxwell's "exceptional" individuals. Both characters seek to resist the downward direction of energy, but Lydgate is finally "shapen after the mean," while Dorothea actually departs from this tendency and regains ardor at the end of the novel. Thus, while Theresa's "fuel" is replenished from within, Dorothea's "energy" temporarily resists the effects of entropic decline. However, to resolve upon this individualizing perspective is to miss the radically *post*-individualist perspective on social relations that the novel seeks to produce. For, Dorothea's personal triumph is temporary and will be disclaimed. Like her sympathetic bond with Rosamond, great feeling is fragile and the trajectory towards decline cannot be contravened. The value of a life does not lie in its capacity to regain energy, then, but in the diffusive effects of that feeling beyond oneself. Eliot thus troubles the absolute antithesis between her two protagonists; they are linked through a larger narrative pattern whereby "wasted energy" becomes the condition for new and salutary forms of influence.

If the final scenes suggest the prodigal power of surplus feeling, then the novel's closing gestures make this power clear. Commenting on the later history of Dorothea's life, the narrator observes:

> […] certainly those determining acts of her life were not ideally beautiful. They were the mixed result of a young and noble impulse struggling amidst the conditions of an imperfect social state, in which great feelings will often take the aspect of error, and great faith the aspect of illusion. For there is no creature whose inward being is so strong that it is not greatly determined by what lies outside it. A new Theresa will hardly have the opportunity of reforming a

> conventual life […]. the medium in which [her] ardent needs took shape is for ever gone. (838)

Whereas an older order has produced monumental expressions of ardor, the ethereal "medium" of the nineteenth century presumes the inevitability of loss; in spite of the increasingly complex nature of the "social state"—indeed, exactly because of its complexity— "great feelings will often take the aspect of error" and "lapse down the wrong channel" (150). True to this new epistemology, passionate feeling is defined through its very depletion, its transition to channels outside of personal experience. As the narrator comments, Dorothea's "finely-touched spirit had still its fine issues, though they were not widely visible. Her full nature…spent itself in channels which had no great name on the earth" (839). Her spirit is "*finely*-touched" and has "*fine*" consequences. Suggesting "a *fine* excess," such impulses are imperceptible but all the more refined; although lost to "the world of effective action," Dorothea's ardor still possesses what Eliot called a "determining effect," a kind of posthumous life in the lives of others.

While Dorothea's actions are ultimately unhistoric, then, her energy continues to impinge upon the processes of history. This becomes clear in the novel's final paragraph:

> But the effect of her being on those around her was incalculably diffusive: for the growing good of the world is partly dependent on unhistoric acts; and that things are not so ill with you and me as they might have been, is half owning to the number who lived faithfully a hidden life, and rest in unvisited tombs. (839)

The celebratory tone of the passage, as readers such as D.A. Miller point out, is rife with qualification. "*Partly* dependent," "*so* ill," "*half* owning": the phrases seem to defer the very progressive discourse towards which they gesture (193). But Eliot's point is just to embrace the ancillary effects of Dorothea's life. Her "diffusive" influence stems from its collateral power, and inheres in the unpredictable effects of surplus feeling. The point of

the passage is not to affirm the uniform efficacy of Dorothea's ardor, but to celebrate its profligate dimension. This surplus cannot be quantified in any exact fashion; it can only be approximated in imagining her "hidden," unproductive energy.

In this sense, Eliot's aesthetic of "*fine* excess" attempts to re-cast an anxiety of diffusive form in the telling of *Middlemarch* itself. Like the "dispersion" augured in the Prelude, the narrator's powers are threatened by transience: instead of epic achievement, "an ardent beginning may be followed by declension" (832). As the narrator explains earlier, "I at least have so much to do in unraveling certain human lots and seeing how they were woven and interwoven, that all the light I can command must be concentrated on this particular web and not dispersed over that tempting range of relevancies called the universe" (141). The narrator's efforts appear as a kind of second-level narrative which looks uncannily like that of her characters': can the writer of realist fiction "concentrate" her energies in some epic outcome, or will her energies merely scatter and disperse? The problem of narrative dispersal would have weighed acutely upon the novel's initial readership. In its initial contexts of serial publication (in eight numbers appearing every two months between December 1871 and October 1872, and the last two volumes in November and December of that year), the question of narrative "concentrat[ion]" or "dispers[ion]" *was* unresolved, making its considerations of "diffusive" energy a metafictional concern.

Like Lydgate and Dorothea, most of the major figures are gone by the finale. The narrator's perspective *is*, in the end, "dispersed over that tempting range of relevancies" outside the community. Yet this "dispersion," like the "dispers[ion]" augured in the Prelude, has been re-conceived as a "diffusive influence." It becomes a principle of

organic relationship and the indirect potential for further progress. Providing its own solution to the terror of a dissipating form, the novel embraces such dispersion as a pattern of development. In this sense, the meta-narrative succeeds in showing just what the narrative itself can only gesture towards. For it seems clear that surplus feeling does not transcend the perspectives of its individual characters. Apart from the expository ending, Eliot's ideal does not resolve into a fully-realized social model. Instead, this model takes shape most convincingly at the level of form and in the unending effects of fiction. For Eliot's readers are implicated within her narrative framework, as the perspective shifts from the characters and conditions within the novel (set in the late 1820s and early 1830s) to "the imperfect social state" of the present. Like Lydgate's "ethereal" medium, the audience exists within an increasingly fragmented milieu: progress does not tend toward a perfect endpoint, but takes shape through the accumulating impulses within the total system, in the ardor of individuals that fails to find perfect expression in another. The same holds true for Eliot's audience, for the bond between “you and me” (838), reader and writer, is at once deeply personal and inherently incomplete. Because we cannot account fully for the intentions of the novel—because of the very slippage between “you and me”--we ensure its vitality in the present. Imperfect though they are, our responses to *Middlemarch*’s “diffusive influence” ensure its continuing circulation in culture.

Ultimately, then, Eliot’s model of surplus feeling finds its truest expression in the act of reading *Middlemarch* itself. For Eliot, it is not that reading is socially productive rather than unproductive, useful and not unuseful. Instead, the very unproductive process of novel-reading becomes a condition for generating affective capital, a growing sense of

organic interconnection uncoupled from any individual viewpoint. The idea is thematized in the final sentences: Dorothea's feeling "*spent* itself" in diffusive channels; in its very unrenumerative nature, such feeling adds to the total reservoir of "invisible conditions" in culture. In "learning the cost of things," Dorothea is not simply conscripted to the norms of a middle-class culture, but is also associated with a vastly different economy of expenditure, a circuit of value completed in the act of reading the novel itself: the surplus of Dorothea's life continues in the lives of Eliot's readership.

In the history of the nineteenth-century novel, Eliot's theory of affective surplus stands somewhere between conventional claims about the social purpose of fiction (which saw its role as articulating and altering the lived conditions of the present) and an Arnoldian ideology of culture (which would seek to abstract art from the political pressures of its time). Eliot would come to retreat from the transpersonal perspectives with which she experimented in *Middlemarch*. In her next novel, *Daniel Deronda* (1876), Eliot returned to the established ideals of multiplicity and the play of competing viewpoints that organized her earlier work. But *Middlemarch*'s implicit ideology of the aesthetic appeared all the more pressing in the years to follow, as formalistic canons of literature took shape and argued that art should stiffen itself against any incursions into political consciousness or the trivalizing task of social change. Somewhat counterintuively, Eliot attempted to explain how the very powerlessness of art--its distance and disengagement from the problems of the present--could also appear as a source of social agency, the means of intervening in the lived experience of our world. Eliot's "fine excess" thus attempts to produce, in the very form of the realist novel, a radical solution to the problems of an increasingly disaggregated society, which sees the

potential for development in its dispersive conditions and realizes in its very excess the possibility for refinement.

NOTES

[106] Important nineteenth-century scientists such as William Thomson, Peter Tait, and Balfour Stewart all advanced spiritual perspectives on energy, often in the service of a reinvigorated Christian theodicy. Stewart and Tait, for example, explained entropy as the sign of spiritual progress and of the endless enlargement of otherworldly powers. As these two authors argued in *The Unseen Universe* (1875), "by far the larger portion of the high-class energy of the present universe [...] is gradually transferred into an invisible order of things. May we not regard the ether or the medium as not merely a bridge between one portion of the visible universe and another, but also as a bridge between one order of things and another [...] in virtue of which the various orders if the universe are welded together and made into one?" (Stewart and Tait 158). For discussions of contemporary religious interpretations of thermodynamics, cf. Gooday, Graeme. "Profit and prophecy: electricity in the late-Victorian periodical," in *Science in the Nineteenth-Century Periodical.* Geoffrey Cantor, Gowan Dawson, Gooday, Graeme, Richard Noakes, Sally Shuttleworth, and Jonathan R. Topham, eds. Cambridge: Cambridge University Press, 2004. Levine, George. *Darwin and the Novelists*. Cambridge: Cambridge UP, 1988.

[107] For an innovative discussion of nineteenth-century literary experiments in thermodynamics, cf. Choi, Tina. "Forms of Closure: The First Law of Thermodynamics and Victorian Narrative." *ELH* 74.2 (2007): 301-322. But whereas Choi calls attention to the closural forms that thermodynamics typified for scientists and novelists, my own interest rests with precisely those patterns of excess and unrecuperable expenditure that resist the potential for any contained closure as such.

[108] Eliot, George. *The Writings of George Eliot*. 25 vols. New York: Houghton Mifflin, 1908. 21: 313.

[109] In keeping with Crosbie Smith's recent cultural history of physics, this chapter uses the term "energy science" to describe the remarkable range of inquiries into the nature and effects of energy from the early 1850s onward. Impelled by the discovery of the first and second laws of thermodynamics, theories of energy supplied a foundation for the developing discipline of physics and for the work of "physicists" in the latter part of the century—a word that William Whewell coined in the 1840s, but which was only very slowly adopted in Britain. As a distinct field of knowledge, physics remained relatively inchoate until the early 1880s, which saw the establishment of

several specially designated physics laboratories in Cambridge and London. Even after that time, inquires could be carried out in areas as diverse as physiology, stellar astronomy, and natural philosophy. Thus, "energy science" suggests a set of interests that physicists would come to claim as their own, but which did not fit a single, coherent program of research in the late 1860s and early 1870s.

[110] Cf. Jaffe, Audrey. *Scenes of Sympathy: Identity and Representation in Victorian Fiction*. Ithaca: Cornell UP, 2000. Also Cf. Ablow, Rachel. *The Marriage of Minds: Reading Sympathy in the Victorian Marriage Plot.* Stanford: Stanford UP, 2007.

[111] Such an understanding was wholly in keeping with contemporary ideas about the nature of scientific hypotheses, shared by Eliot and her scientist friends like Tyndall and William Clifford. For these writers, "models" are necessary fictions that allow us to move from the ideal realm of feeling and the outward world of objects. Even though models can never overlap perfectly with reality, they still allow a basic purchase upon it, and add to an increasing synthesis between our inward intuitions and the extant environment. See Shuttleworth, Levine, and Davis.

[112] Showalter, Elaine. *A Literature of their Own: British Women Novelists from Brontë to Lessing*. Princeton: Princeton UP, 1977. 128.

[113] Armstrong, Nancy. *Desire and Domestic Fiction: A Political History of the Novel.* New York: Oxford UP, 1987. 21; Miller, D.A. *The Novel and the Police*. Berkeley: U of California Press, 1988. 149.

[114] As Miller writes, "the community sees desire as the sign of a dangerous excess, and its narrative moves to suppress it correspondingly. The protagonists experience desire as a deficiency, and their 'scripts' naively attempt to satisfy it" (120). Miller views this "deficiency" as a naïve impulse towards emotional transcendence which the community (by definition) always undermines. However, my point in this essay is that Eliot actively recasts this structure of desire itself, and re-articulates the polarity between "excess" and "deficiency" so as to produce a vastly different distribution of value.

[115] Qtd. in Shuttleworth, 159.

[116] Brody, Selma B. "Physics in *Middlemarch*: Gas Molecules and Ethereal Atoms." *Modern Philology* 85 (1987): 42-53. 43. While several scholars have noted the novel's interest in physics, they almost invariably interpret it in light of Eliot's general understanding of science and of the scientific

process. Those who do acknowledge physics' importance as a social model tend to see it in terms of an individualistic structure of exchange, and do not consider the first and second laws of thermodynamics themselves. For valuable readings along these lines, cf. Brody and Dale, Peter Allen. *In Pursuit of a Scientific Culture: Science, Art, and Society in the Victorian Age*. Madison: U of Wisconsin Press, 1989.

[117]Qtd. in Jones, Bence. *The Life and Letters of Michael Faraday*. 2 vols. London: Longmans, 1870. 1:311.

[118]Qtd. in Edward Youmans, ed. *The Correlation and Conservation of Forces: A Series of Expositions by Prof. Grove, Prof. Helmholtz, Dr. Mayer, Dr. Faraday, Prof. Liebig and Dr. Carpenter*. New York: Appleton, 1865. 22. Grove's writings would have resonated with her husband George Henry Lewes's work on *Problems of Life and Mind* (1871). As Lewes writes, "[t]he universe to us is the universe in Feeling, and all its varieties are but varieties of Feeling. With the feeling of difference or otherness arises the judgment of not-this, which in turn evolves the distinction of Self and Not-self. These two aspects are abstractions; in Feeling they emerge simultaneously as correlations" (I:194).

[119] Harman, P.M. *Energy, Force, and Matter: The Conceptual Development of Nineteenth-Century Physics*. Cambridge: Cambridge UP, 1982. 162.

[120] Quoted in Smith, Crosbie. *The Science of Energy: A Cultural History of Energy Physics in Victorian Britain*. Chicago: U of Chicago Press, 1998. 214.

[121] *Ibid.* 216.

[122] Tyndall, John. *Fragments of Science for Unscientific People*. London, 1871. I:14.

[123] Qtd. in Smith, 103.

[124] Balfour-Stewart, John. *The Conservation of Energy: Being an Elementary Treatise on Energy and its Laws*. London: Henry S. King and Co, 1873. 36.

[125] For influential readings of Lydgate in relation to nineteenth-century biology and medicine, cf. Greenberg, Robert. "Plesxuses and Ganglia: Scientific Allusion in *Middlemarch*," Nineteenth-Century Fiction 30 (1975): 33-52. Mason, Michael Y. "*Middlemarch* and Science: Problems of Life and Mind." *Review of English Studies* 22 (1971): 151-169. Rothfield, Lawrence. *Vital Signs:Medical Realism in Nineteenth-Century Fiction. Princeton*: Princeton UP, 1994. Tambling. Jeremy. *"Middlemarch, Realism, and the Birth of the Clinic*." *ELH* 57 (1990): 939-69.

[126] Shuttleworth, 159.

[127]As Tyndall explained famously, "Whether [matter and force] recombine in the furnace of the steam-engine or in the animal body, the origin of the power they produce is the same. In this sense we are all 'souls of fire and children of the sun.' But, as remarked by Helmholtz, we must be content to share our celestial pedigree with the meanest of living things" (*Fragments* II:72).

[128] Levine, 14.

[129] Tyndall, I:8.