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Strata, Soma, Psyche: Narrative and the Imagination in the Nineteenth-Century Science of Lyell, Darwin, and Freud

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Graduate Program in English
A thesis submitted in partial fulfillment of the requirements for the degree in Doctor of Philosophy
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STRATA, SOMA, PSYCHE:
NARRATIVE AND THE IMAGINATION IN THE NINETEENTH-CENTURY
SCIENCE OF LYELL, DARWIN, AND FREUD

(Monograph)

by

Pascale McCullough Manning

Graduate Program in English

A thesis submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

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Abstract

My dissertation, “Strata, Soma, Psyche: Narrative and the Imagination in the Nineteenth-Century Science of Lyell, Darwin, and Freud,” contributes new research to the diverse field mapping the intersections of science and literature in the nineteenth century. Although scholars such as Gillian Beer and George Levine have established ties between developments in the natural sciences and the scope of the nineteenth-century novel, there has not been a sustained effort to attend to the narrative structures of the primary texts that most influenced coterminous literary movements of the period. My work thus attends closely to the narrative and imaginative form of scientific writing that attempts to transcend the limits of what can be seen. All three of Charles Lyell’s, Charles Darwin’s, and Sigmund Freud’s discipline-making texts (*The Principles of Geology*, *On the Origin of Species*, and *The Interpretation of Dreams*) deal with historical forces whose operations cannot be observed in action, but only through the traces that are left behind. Three long single-author chapters detail how each text reconciles the ambition to establish a new branch of empirical science with the necessity of relying on the imagination to ford the gaps in physical evidence. I provide close readings of these foundational texts, identifying in each the rhetorical systems by which it represents and details what has never been present, and I demonstrate how each author strategically employs methods more conventionally associated with fictional narratives in the pursuit of establishing scientific facts. As a result, my project reframes the dominant concerns of Nineteenth-Century Literature and Science Studies by focusing in on how literary point of view, diversely defined, enables scientific thought to find a language in which to speak.

Keywords

Literature, Science, Nineteenth Century, Charles Lyell, Charles Darwin, Sigmund Freud, Geology, Evolution, Psychoanalysis, Narrative, Imagination, Figurative Language, Empiricism, Samuel Taylor Coleridge, William Wordsworth, George Eliot, Thomas Hardy.

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INTRODUCTION

TO ANNEX THE UNSEEN: EMPIRICAL SCIENCE AND THE LANGUAGE OF THE IMAGINATION

For the wit and mind of man, if it work upon matter, which is the contemplation of the creatures of God, worketh according to the stuff and is limited thereby; but if it work upon itself, as the spider worketh his web, then it is endless, and brings forth indeed cobwebs of learning, admirable for the fineness of thread and work, but of no substance or profit. Francis Bacon (I 4:5 30)¹

Imagination!—lifting up itself / Before the eye and progress of my song / Like an unfathered vapour, here that power, / In all the might of its endowments, came / Athwart me. William Wordsworth (1805 6.525-9 217)

I.

How do we know what we know, and what is the shaping power of the mind? From Bacon to Hume, and from Burke to Coleridge and Wordsworth, these twin questions have long themselves had a shaping influence on philosophies of the mind and the imagination. Let us begin by attending to the first of these two questions. As Mary Warnock reminds us, it was René Descartes who “set philosophy in the habit of raising the question ‘what are we aware of?’ in a general form, and of answering that we are aware of *the content of our consciousness*” (13). Descartes finds that when we objectify these contents, we discover that our consciousness is made up, in Warnock’s phrase, of

“mental objects or *ideas*” (13). When John Locke wrote, in *An Essay Concerning Human Understanding*, that “all ideas come from sensation or reflection” he was in agreement with Francis Bacon, cited above, who argued that the only reliable idea, and thus, item of knowledge, was derived from the study of matter, and not, as he writes, from the cobwebs woven onto the pages of books. Indeed, those spider webs upon the library shelf receive an even harsher condemnation from David Hume, in *An Enquiry concerning Human Understanding*; after asserting that “every idea is copied from some preceding impression or sentiment; and where we cannot find any impression, we may be certain that there is no idea” (7:2 61), and that reason cannot be employed to demonstrate the *existence* of a thing, he goes on to write:

When we run over libraries, persuaded of these principles, what havoc must we make? If we take in our hand any volume; of divinity or school of metaphysics, for instance; let us ask *Does it contain any abstract reasoning concerning quantity or number?* No. *Does it contain any experimental reasoning concerning matter of fact and existence?* No. Commit it then to the flames: for it can contain nothing but sophistry and illusion. (12:3 123)

Writing in the tradition of empiricist thought established in the preceding century by Bacon and Locke, Hume insists that abstract reasoning must first be founded upon what he calls “matters of fact,” or propositions which arise out of observations of the world’s natural objects, or, more simply, from experience (4:1 25). For Hume, without past experience, the reasoning mind has no foundation for perception, thought, or idea, and the library books he vilifies in this passage stand in for the Baconian “cobwebs of

learning,” which may suture together strands of knowledge exclusively through the faculty of reason without the concrete evidence of sense data upon which ideas should be based.

According to Locke, “our knowledge is founded” in “experience” and from “our observation, employed either about external sensible objects, or about the internal operations of our minds” (I 2:1 54). And from the Lockean concept of the mind as a “white paper” or a *tabula rasa*, William Godwin writes, in his *Enquiry Concerning Political Justice*:

All our knowledge, all our ideas, every thing we possess as intelligent beings, comes from impression. All the minds that exist set out from absolute ignorance. They received first one impression, then a second. As the impressions became more numerous, and were stored up by the help of memory, and combined by the faculty of association, so the experience increased, and with the experience the knowledge, the wisdom, every thing that distinguishes man from what we understand by a ‘clod of the valley’. (II 1:2 94).

Godwin’s précis of empirical philosophy reasserts the dictum that sound ideas are derived from impressions. Writing in the midst of a great age for empirical science, Godwin recalls to the reader the Baconian imperative to attend first to “the substance of matter,” which, Bacon writes, “is better than the beauty of words” (I 4:5 29). While it is true that Bacon’s argument in *The Advancement of Learning* is often moralizing – Book I is preoccupied with evidencing the assertion that “learning doth soften men’s minds . . . and pervert men’s dispositions” – Bacon’s claim, that the thought-productions of “wits . . .

shut up in the cells of a few authors” generate only “distemper” because they “study words and not matter,” deserves attention because it establishes an antipathy between empirical philosophy, and by extension, the empirical scientific method, and the productions of language (I 2:1 11, I 4:5 30).

Bacon’s point here is twofold. Firstly, ideas born of study and not experience are imbalanced and perhaps even diseased. Secondly, and as he notes in the second part of this passage, partial and fragmentary notations of the concrete evidence afforded by observations of the world are preferable to carefully woven and coherent analyses, “admirable for the fineness of thread and work,” for these are not only “of no substance or profit,” but may generate mental imbalance in those who read them. To be sure, Bacon is railing against the unwholesome consequences of learning about the natural world from books, and of adopting rigid precepts (especially Aristotle’s)² which, “by strictness of rules and axioms,” restrict our naturally supple minds into a state of “distemper” (I 4:5 30, 2:1 11). But it is the potential of language, to ‘weave’ and ‘work’ the threads of thought into new images, which may in turn expand upon the original substance material out of which the threads themselves were teased, that, like a bogeyman, lurks behind Bacon’s statements against the productions of reason rather than experience. When we work “according to stuff,” the raw material available to observation, and are “limited thereby,” and able only to produce a roughly hewn and partial account of the systems of nature, limits, it is hoped, are placed upon the observer, and the text produced evinces a willingness to be modified by the acquisition of new knowledge (I 4:5 30). Bacon’s distrust of language is clear: “words are but the images of matter” and “the substance of matter is better than the beauty of words” (I 4:3 28, 4:5 29). For Bacon, as for Locke,

Hume, and Godwin, observation is the foundation that supplies the understanding.³ As Bacon makes clear, language, which “work[s] upon itself,” and is thus not “limited” by the partialness of what is available to observation, but is instead “endless” in its potential to build and connect images, is an unruly mediator of the “stuff” of observation (I 4:5 30).

Bacon’s distrust of words is echoed in Book III of Locke’s *Essay*, in a chapter entitled “Of the Abuse of Words.” Here, Locke writes:

Besides the imperfection that is naturally in language, and the obscurity and confusion that is so hard to be avoided in the use of words, there are several willful faults and neglects, which men are guilty of, in this way of communication, whereby they render these signs less clear and distinct in their signification then naturally they need to be. (III 10:1 359).

Besides the fact that the words on a page are subject to the flaws of the author combining them, language has a history of its own, and words are composites of other words, making their meaning difficult to fix. Witness “empiricism,” which is derived from the Greek ἔμπειρος, meaning *skilled*, *trial*, or *experiment*, and ἐμπειρία meaning *experience*, then translated to the Latin *experientia* and *empīricus* which ultimately translate to the English *experience* and *empirical*.⁴ The capacious power of language, its ability to mean numerous things at once, makes it an unstable ground upon which to build. As T.S. Eliot writes in Canto V of “Burnt Norton,” “Words strain, / Crack and sometimes break, under the burden, / Under the tension, slip, slide, perish, / Decay with imprecision, will not stay in place, / Will not stay still” (180). Words strain because language is subject to the creative reach of the imagination, and because any given word may be freighted with the

connotative redirections of numerous source words. As Hume writes, many words “have very loose meanings annexed to them; and their ideas are very uncertain and confused” (2:7 61*n*).

From Bacon to Locke to Hume the empirical philosophy inherited by the practitioners of natural science in the nineteenth century is fraught on the subject of the power of language both to lend the appearance of coherence and connection in its account of the world, and, ironically, to build upon the concrete object being described, reaching past the limits of experience. Language both threatens to contain and to expand its object. The purpose of this short history of empirical philosophy prior to the nineteenth century has been to convey the extent to which, for these thinkers, language is suspect, both because a writer’s ego may lead to the crafting of “cobwebs of learning” in lieu of “work[ing] according to the stuff” and being “limited thereby,” and because words cannot comfortably stand in for the solidity of concrete evidence.

II.

This dissertation, which attends closely to the rhetorical techniques employed in three paradigmatic texts of nineteenth-century natural science, takes as its premise that the empirical precepts inherited by Charles Lyell, Charles Darwin, and Sigmund Freud undergo a radical revision as the sciences of geology, evolution, and psychology give notice to processes that cannot, strictly speaking, be observed. Their three paradigm-altering texts, *Principles of Geology*, *On the Origin of Species*, and *The Interpretation of Dreams*, each demonstrate a dual allegiance. First, all three, through repeated use of the

language of observation, experience, and experimentation, align themselves with the empirical scientific method first outlined by Bacon, where systematic observation, measurement, and experiment allow for the formulation of hypotheses and the establishment of scientific facts. Second, all three texts attest to the necessity of enlarging the parameters of empiricism, to make way for the plastic power of language and narrative to establish connections and to reach out, from the evidence of experience, into the expansive range manifested by imaginative language.

Lyell's *Principles* catalogues evidence collected by the author over hundreds, perhaps thousands, of hours of geological study. Field trips in Wales, Scotland, England, and France supply Lyell with quantities of data about the processes governing the upheaval and subsidence of strata. Collating his own experience with the observations of his predecessors (James Hutton in particular), Lyell is prepared to claim, as he does in *Principles*, that rupture in one quarter of the earth's strata, such as "subterranean convulsions," volcanic eruption, and erosion, lead to shifts – uplift, tilting, and deposition – in the composition of strata in a new quarter (I 19). Thus the ground on which we stand may very well once have been a sea floor which, over eons, undulated ever upward until it rose above sea level. Lyell's model of rupture and repair in the earth's crust is largely inherited from Hutton's *Theory of the Earth*, and so far we are within the guiding precepts of empirical science, where concrete evidence fuels observation. And what could be more concrete than the rocks that populate Lyell's field of vision? But Lyell adapts Hutton's theory of the earth's antiquity, adding to it the claim that "the destroying and reproductive operations of modern times" remain "unaltered" from "those of remote eras" (I 20). *Principles of Geology* must explain the *process* of those "destroying and

reproductive operations” in order to justify the thesis that the operations of antiquity mirror those of the modern age. But these processes are not available to observation, at least not in their totality. A geologist may observe a cataract of water pounding interminably against a cliff’s stone base, but in all likelihood he will not, even in the course of his whole life, observe the transformation, through the action of the water, of that stone base first into fragments, then into smaller particles of stone, and ultimately, perhaps, into a fine sedimentary powder. The actions of the geological world are unimaginably slow, discontinuous, and non-directional. The cataract does not pound the rock in order to produce sediment which, settling, will establish a stratigraphic record of its era. But in Lyell’s text, sequence is imposed upon the processes of nature in order to tell the story of the earth’s deep past. *Principles of Geology* offers numerous passages in which narrative subtly sequentializes the discontinuities of the stratigraphic record, as when Lyell imaginatively traces the history of a river carving its way to the Mediterranean Sea.

The same is true for Darwin in *On the Origin of Species*. The process of natural selection, where beneficial characteristics are unconsciously selected over innumerable generations, cannot be observed in its *happening*. It is the growing field of animal husbandry that affords Darwin the evidence he needs – and a laboratory of sorts – to prove the viability of his theory of natural selection. He writes that “it is certain that several of our eminent breeders have, even within a single lifetime, modified to a large extent some breeds of cattle and sheep,” adding that “breeders habitually speak of an animal’s organization as something quite plastic, which they can model almost as they

please” (*Origin* 90). Through the evidence afforded him by numerous eminent breeders, Darwin reasons that:

Slow though the process of selection may be, if feeble man can do much by his powers of artificial selection, I can see no limit to the amount of change, to the beauty and infinite complexity of the coadaptations between all organic beings, one with another and with their physical conditions of life, which may be effected in the long course of time by nature’s power of selection. (*Origin* 153)

But, like rupture and repair in the earth’s crust, the “long course of time” required for nature to effect its “power of selection” defies observation. And so Darwin establishes, as the basis of his theory of transmutation, certain thought experiments that mobilize the concrete knowledge of species he gains over decades of cataloguing with an abstract idea of species change. The theory of natural selection is thus an imaginative extrapolation, arrived at through inductive reasoning, but nonetheless heavily reliant upon the flexibility of certain key linguistic formulations and the faculty of the imagination to bridge gaps in the fossil record, to accelerate an immense lapse of years into imageable, and thus assimilable, epochs and periods, and to explain and systematize mechanisms in nature which are themselves not necessarily systematic.

Adapting Lyell and Darwin’s actualism, the concept that the operations of the past can be explained in the terms of the observable operations of the present, in *The Interpretation of Dreams* Freud designates the psyche as the holding tank of the innumerable historical events dotting the individual’s psychological journey to the present. Recuperating the human from the oblivion of Lyell and Darwin’s model of the

earth's deep time, where a human life barely registers a nanosecond on the earth's ticking clock, the individual's psyche, her mental life, is registered by Freud as constituting its own immense, slow, observable present in the form of the dreams and psychoses that are continually surfacing from and submerging back into the dark recesses of the mind. For Freud, the mind, like the earth, like species, is in a continual state of flux, of rupture and repair, and of development, and like the earth and its inhabitants, the processes of the mind may be mapped. But, again, since the mental life is largely concealed from view, except in the rare instances where mental trauma manifests itself somatically, Freud develops a flexible lexicon for the operations of thought, and makes language – the words his patients use to describe their thoughts – a primary source of material evidence to prove his theory about the unconscious.

All three of Lyell, Darwin, and Freud seek to reside, to borrow T.S. Eliot's phrase from Canto II of "Burnt Norton," "At the still point of the turning world" (177). That is to say that all three, like Eliot's speaker, look for an observational vantage point in a world constantly in flux. In order to establish the stability of their observing gaze, the plastic properties of language – the expanding work of metaphor and simile, the creation of correspondences enabled by the strategic use of analogy, and the unifying and sequentializing work of narrative description – stand in for the likewise plasticity of the processes being described.

My dissertation traces a paradigm shift in nineteenth-century natural science, where the capacious power of the imagination – to synthesize the fragmentary evidence gathered from observation, and to reach past what is familiar not only to grasp what is unknown, but to create mental images of that which has not been experienced, its power

to generalize, to harmonize, to unify, to invent, and to make – is mobilized to substantiate the claims of empirical science.

III.

We may now turn to my second opening question: What is the shaping power of the mind? From David Hume's *A Treatise of Human Nature* to Edmund Burke's *A Philosophical Enquiry into the Origin of our Ideas of the Sublime and Beautiful*, the mind's power to reproduce impressions as images, and, in Warnock's phrase, to "fill in the gaps in our experience" receives careful and systematic attention throughout the eighteenth century (24). For Hume, the imagination has the "propensity to feign the continu'd existence of all sensible objects," or to make today's experiences compatible with yesterday's (*Treatise* 209). And yet for Hume the necessity of the imagination for human sanity (our crucial ability to recognize resemblances between objects when our perception of them has been interrupted) would seem to be regrettable. In his discussion of this mental faculty Hume's language is consistently derisive and mocking. He describes the productions of the imagination as "false," 'feigned', "trivial" and 'illusory', and the faculty itself both as subject to undisciplined redirections and as a mental force that threatens to "lead us into such errors, absurdities, and obscurities, that we must at last become ashamed of our credulity. Nothing is more dangerous to reason than the flights of the imagination, and nothing has been the occasion of more mistakes among philosophers" (267). Indeed, Hume writes:

I cannot forbear giving vent to a certain sentiment. . . . I begun this subject with premising, that we ought to have implicit faith in our senses, and that this wou'd be the conclusion, I shou'd draw from the whole of my reasoning. But to be ingenuous, I feel myself *at present* of a quite contradictory sentiment, and am more inclined to repose no faith in all my senses, or rather imagination, than to place in it such an implicit confidence. I cannot conceive how such trivial qualities of the fancy, conducted by such false suppositions, can ever lead to any solid and rational system. (217)

The faculty of the imagination threatens to seduce us with false, feigned, and sometimes frivolous illusions. Though Hume goes on in his *Treatise* to distinguish between positive and negative functions of the imagination, he nevertheless establishes that the productions of our imagination deserve our most rigorous skepticism.

This Humean distrust of the imagination is particularly registered by Darwin in the *Origin*, whereas both Lyell and Freud adhere more closely to Joseph Addison's and Edmund Burke's assessments of the faculty. In his article for *The Spectator* of Monday, June 23rd, 1712, Addison writes:

Our imagination loves to be filled with an object, or to grasp at any thing that is too big for its capacity. We are flung into a pleasing astonishment at such unbounded views, and feel a delightful stillness and amazement in the soul at the apprehension of them. The mind of man naturally hates every thing that looks like a restraint upon it, and is apt to fancy itself under a sort of confinement, when the sight is pent up in a narrow

compass, and shortened on every side by the neighbourhood of walls or mountains. On the contrary, a spacious horizon is an image of liberty, where the eye has room to range abroad, to expatiate at large on the immensity of its views, and to lose itself amidst the variety of objects that offer themselves to its observation. Such wide and undetermined prospects are as pleasing to the fancy, as the speculations of eternity or infinitude are to the understanding. (No. 412)

As Marjorie Hope Nicolson argues, Addison's text acknowledges the natural human desire to escape from limitations (314). For Addison, as for Burke, there is value in the operations of the imagination, which has a salutary effect upon the understanding precisely *because* it compels us to reach from sense experience toward greatness and boundless potential, or a "spacious horizon." The language of Addison's text, of infinitude, amazement, liberty, and boundlessness, anticipates the lexicon of Burke's concept of the sublime, developed some forty years later. Burke's *Inquiry* aims to systematize our response to infinitude, and to establish general laws for the faculty which, in Hume's formula, threatens to carry us away from the source matter at the origin of all our ideas. Burke seeks, as Addison does, to ennoble the imagination and the aesthetic judgments we arrive at through this faculty, and to establish, *pace* Hume, that these judgments are not mere whimsy. In the *Inquiry*, Burke insists that there are universal standards of judgment: the senses are the origin of all our ideas; the senses are a universal faculty and thus access to sense-data is likewise universal; and even though our judgments are arrived at subjectively, since our ability to perceive through the senses is itself universal, then the judgments we arrive at must be subject to universal standards of

judgment. For both Addison and Burke the mind abhors limits, and to allow the mind “to lose itself amidst the variety of objects that offer themselves to its observation” is to broaden the scope of our understanding. Burke writes:

But let it be considered, hardly anything can strike the mind with its greatness, which does not make some sort of approach toward infinity; which nothing can do whilst we are able to perceive its bounds; but to see an object distinctly, and to perceive its bounds, is one and the same thing.

A clear idea is therefore another name for a little idea. (45)

Greatness in the world adds dimension to the mind. To know more, and to know differently, we must allow the magnitude of things to invade the mind so that we may exceed the bounds of our current knowledge.

For all three of Lyell, Darwin, and Freud, it is the special shaping power of their individual minds that allows for the development of their paradigm-altering ideas. And so it will be my practice throughout this dissertation to ask “What are the terms of an empirical study which, either tacitly or overtly, insists upon a validation of the faculty of the imagination?” My object is not to delineate the debate between a Baconian, Lockean, or Humean conception of empirical science and the methods of Lyell, Darwin, and Freud. Rather, I seek to understand how Lyell, Darwin, and Freud conceive and make use of the connective propensities of the mind and how narrative and figurative language allow them to effectively convey the processes they seek to explain. All three of these figures declare themselves empiricists, and yet all three embrace the ambiguity of language, and the inability of words to fully grasp the objects they describe. Indeed, all three *depend*

upon the shaping power of their mind and upon the forward reach of language, which together, allow them to project beyond what is strictly observable.

Finally, all three of Lyell, Darwin, and Freud evidence the influence of a Romantic conception of the imagination, especially as it is enlisted by William Wordsworth and Samuel Taylor Coleridge. In Chapter XIII of *Biographia Literaria* Coleridge describes the “esemplastic power” of the imagination, its ability to grasp the indefinite and to actively integrate the fragments it receives into thought-unities (195). For Coleridge, the imagination is a fusing faculty, synthesizing the partial information available to the mind and shaping it into something more. Rejecting passive perception, and championing instead a mode of receptivity in which the mind is open to drawing associations and to forming images that exceed the evidence of experience, Coleridge insists that the imagination is a “*vital*” faculty whose productions have value in and of themselves and do not stand in simple opposition to the productions of the rational mind (*Biographia* 202, 196). In language that echoes Burke’s in the *Inquiry*, Coleridge writes in a letter to Thomas Poole, dated October 16th, 1797:

Those who have been led to the same truths step by step thro’ the constant testimony of their senses, seem to me to want a sense which I possess— They contemplate nothing but *parts*—and all *parts* are necessarily little— and the Universe to them is but a mass of *little things*. . . . I have known some who have been *rationally* educated, as it is styled. They were marked by a microscopic acuteness; but when they looked at great things, all became a blank & they saw nothing—and denied (very illogically) that any thing could be seen; and uniformly put the negation of a power for the

possession of a power—& called the want of imagination Judgment, & the never being moved to Rapture Philosophy!— (*Letters* 355).

Whereas Baconian empirical philosophy advocates acquiescing to the limits imposed upon us by the “stuff” of our observation from which are revealed only “parts” of the whole system of nature, Coleridge insists not only that greatness must be integrated into our vision of the world, that the sphere of observation must be widened and our eyes forced to adjust from the microscopic to the macroscopic, but also that we are endowed with the capacity to unify what we see, to transform *parts* into *wholes*. Coleridge calls for the expansion of the boundaries of judgment and philosophy and the sciences of geology, evolution, and psychology answer his call by establishing methods whereby both the “microscopic acuteness” of empiricism and an awareness of “great things,” the systems of the earth, may be mapped together.

In *The Prelude*, Wordsworth considers the imagination as “like a guide into eternity” that carries the mind “Beyond the limits which my feet have trod,” introducing it “to things unknown and without bound” (Bk.12, 1805 150-3 444). For Lyell, the imagination transports him beyond the stratigraphical record to the theory of uniformitarianism; for Darwin, it is a journey from the evidence of animal husbandry and the fossil record to the theory of natural selection, and for Freud, the boundaries of other peoples’ minds are crossed through the theory of the unconscious. When, in *The Prelude*, Wordsworth pauses to “bend in reverence / To Nature, and the power of human minds” he could not have known how his belief in the plasticity of the imagination would find a voice in three of the great scientific texts of his age (Bk. 13, 1805 223-4 448).

The three single-author chapters to follow will offer readings of the relationship of nineteenth-century science to the productions of the imagination. From Lyell to Darwin to Freud, the sciences of geology, evolution, and psychology each evidence the impress of Wordsworth's apostrophe to nature in *The Prelude*. It is as if all three men are negotiating the force confronted by the poet, which he says, "lifting up itself / . . . In all the might of its endowments, came / Athwart me" (6.525-9)

Notes

¹ For Bacon's *The Advancement of Learning*, Locke's *An Essay Concerning Human Understanding*, and Godwin's *Political Justice*, citations will be listed as (Book Chapter: Section Page). For Hume's *An Enquiry Concerning Human Understanding*, citations will be listed as (Chapter:Section Page).

² See (I 4:5 51), where Bacon writes: "This kind of degenerate learning did chiefly reign amongst the Schoolmen: who having sharp and strong wits, and abundance of leisure, and small variety of reading, but their wits being shut up in the cells of a few authors (chiefly Aristotle their dictator) as their persons were shut up in the cells of monasteries and colleges, . . . did out of no great quantity of matter and infinite agitation of wit spin out unto those laborious webs of learning which are extant in their books." (30)

³ See Locke (2 1:2 54): "Our observation . . . is that which supplies our understandings with all the materials of thinking."

⁴ "empiric, adj. and n.". OED Online. June 2013. Oxford University Press. 29 June 2013 <<http://www.oed.com/view/Entry/61340>>.

CHAPTER ONE

FICTION AND THE GEOLOGICAL IMAGINATION IN CHARLES LYELL'S *PRINCIPLES OF GEOLOGY*

When it is first advanced, theory is at its most fictive.

G. Beer (*Plots* 1)

The ancient memorials of nature were written in a living language.

C. Lyell (I 24)

I.

In tracing the ties that join science and literature, students of the productions of the nineteenth century have repeatedly allied the principles and methods of empiricism with those of the realist fiction that emerges around mid-century. The vast majority of the studies devoted to mapping the convergences of science and literature have taken Darwin and his theory of evolution and natural selection as the touchstone by which to measure the instantiation of scientific discourse in literary narratives. In what follows, I hope to show that the geologist Charles Lyell, though often forgotten in the discussion, has contributed significantly to the ties between Victorian realist fiction and the great scientific revolutions of the age.

From Gillian Beer, to Sally Shuttleworth, and George Levine (to name only a few), critics have looked to Darwin for insight into a new scientific mindset which his

work in evolutionary biology is seen to exemplify. This is a mindset which must balance the information received from observable phenomena with deductions arrived at through a consideration of the unobservable. For instance, whereas Darwin makes use of the example of animal breeding to demonstrate the plasticity of biological structures and the means by which certain desirable characteristics can be isolated and selected for in favor of other less attractive or beneficial characteristics, to extrapolate from this example (in which changes in the make-up of an animal may be visible within a few generations) to the theory of natural selection in the wild (in which change happens achingly slowly) requires a considerable mental adjustment. The Darwinian theory of evolution is characterized by mind-contorting thought experiments through which the imagination stands in for the eye in the conversion of concrete data on extant and extinct species into the unobservable abstraction of species transmutation. Whereas the empiricist's eye may extrapolate from the example of artificial selection, which Darwin demonstrates in *On the Origin of Species* through numerous examples of how animal husbandry has long been a site of experimentation in artificial selection, it is the mind's eye which must make the leap from the idea of apparently fixed species to the concept of transmutation; for the process, though ongoing, is invisible to any given observer.

With any attempt to construct a systematic picture of species transmutation complicated by the yawning gaps in the available fossil record, Darwin's particular brand of empiricism sought a middle ground between a strict Baconian inductivism and a state of imaginative suspension enabling him to think past Baconian strictures of verifiable, reproducible, falsifiable knowledge and, in Levine's phrasing, to "imagine what wasn't there and could never be seen" (*Darwin 1*). But it is important to recognize that while

Darwin was not furtive about this element of his theory – that natural selection was not itself empirically verifiable – neither did he dwell on this vexing truth. The “one long argument” (435) of the *Origin* is powerfully bolstered by deductions arrived at through Darwin’s direct observation not only of fossils and animals in the wild, but also of the methods of artificial selection employed in breeding animals in captivity. Nevertheless, Darwin’s writings obliquely gesture to the troubling problem of witnessing in evolutionary science.

According to Shuttleworth, Beer, and Levine, the alliance of realist fiction with Darwinian science occurs because of shared observational concerns. Where the scientist may only obliquely gesture, the novelist is free to offer sympathetic reflective notice. Whereas the genre of Darwin’s text prevents him from attending to the human implications of how his theory escapes observation, realist fiction is a well-equipped medium through which to flesh-out Darwinian thought in human terms. Levine has suggested that it is their mutual acceptance of a gradualist principle of development that binds realism to Darwinism (*Darwin* 5). Their shared foundation upon the belief that organisms develop according to slow and perhaps even imperceptible change allows each to be read as a meditation upon fundamental concerns of the other.¹ Thus in clearing a space to exercise the flexibility of mind necessitated by Darwinian science, realist fiction can, for instance, cast imaginative light upon the very transitions in development which science cannot observe.

In her study of realist fiction and Darwinism, Shuttleworth demonstrates how, in an age greatly occupied with the measurement and classification of the natural world, George Eliot’s fiction takes up the concerns of natural science and applies its methods to

the mapping of the social organism. For Shuttleworth, Eliot's persistent engagement with various principles of organic theory – a theory which, put simply, proposes that natural law causes all organisms in the natural world to coexist in a complex interdependence where, as Shuttleworth puts it, “the form and development of each part is dependent on that of the whole” – engendered a conceptual framework through which Eliot could assess, in her fiction, various scenes of social and psychological life (15).

Similarly, Levine has studied the convergences of literary and scientific forms of discourse in his survey of nineteenth-century novels which share a brand of realism which he comes to call “uniformitarian” realism. Levine lines up the diverse narrative voices of Jane Austen, Walter Scott, Charles Dickens, Anthony Trollope, Thomas Hardy, and Joseph Conrad to theorize a Darwinian literary form – one which does not require the author in question either to know Darwin's writing intimately, or, in some cases, to know it at all (Austen and Scott necessarily fall into this category as producers of anticipatory texts). Levine's *Darwin and the Novelists* seeks to broadly uncover overlapping concerns and points of view between Darwinian and realist fiction. He claims that the Victorian novel's “preoccupation with multiple and complex social relations, with growth and change, with uniform and minute and inexorable sequences” reveals an affinity with Darwinian scientific thought (21). As for the inclusion of texts that predate Darwin, Levine summarizes his point of view as follows: “In the earlier novels we can, as it were, watch Darwin coming; in the later we can feel his presence” (*Darwin* 21). The Darwinian literary form, then, is understood by Levine as a product of cultural discourse, that is, of broadly shared thematic concerns.

What Levine calls “uniformitarian realism,” and Shuttleworth, in relation to George Eliot, simply calls “realism,” is best defined by Beer’s description of Eliot’s organizing principle in *Middlemarch*. Beer describes Eliot’s causal sequence as follows: “In the uniformitarian ordering of *Middlemarch* events, however seemingly catastrophic, are prepared for the by slight incipient movements, crumbings, pressures, erosions, and siltages observable to an immeasurably patient eye, whether it be that of Uriel² in the sun ‘watching the progress of planetary history’ (as she writes in *Middlemarch*) or that of the novelist exempted from the partiality and subjectivity of her personages” (*Plots* 169).

Whereas Beer’s primary concern in *Darwin’s Plots* is, of course, how the literature following Darwin carried the freight of his ideas, it is through the language of Charles Lyell’s geology that Beer most succinctly expresses the relationship between fiction and science. Realist fiction, with its interest in the small, apparently unimportant events of everyday life – the little parochial tragedies that make up the minutiae that history leaves out of its grand narratives – provides a space for the exploration of the shifting ground of character, relationship, community, et cetera. And while Beer primarily emphasizes how elements of *Darwin’s* sustained meditation on the divergent, retrogressive, and interconnected processes of evolution are given voice in the realist fiction of Eliot and Hardy, Charles Lyell’s contribution to the discussion deserves to be further explored.

While Beer, Shuttleworth, and Levine acknowledge that the “uniformitarian ordering” in realist fiction is indebted to Charles Lyell’s study of continuity in the geological world – a study which popularized the language of gradualism, uniformitarianism, and a steady-state view of history nearly thirty years before Darwin’s *Origin* appeared – their texts on the subject invariably position him as a transitional

figure, whose strategies, in Levine's words, wanted "Darwin's powerful theoretical and practical application" to make them figure in the cultural matrix (*Darwin* 6). The immeasurably patient eye observing the world (which in Beer's study is likened to the narrator's eye gradually uncovering a "web of affinities"³ in *Middlemarch*) is inevitably Darwin's, but I would argue that the particularly Darwinian struggles to taxonomize "what wasn't there and could never be seen," and to "find a language to think in," are inherited imaginative paradoxes, bequeathed to Darwin by Lyell's work in *Principles of Geology* (*Darwin* 1, *Plots* xvii).

Indeed, the detached narrator that Beer describes ("exempted from the partiality and subjectivity of her personages") is much more a Lyellian figure than a Darwinian one. For Lyell's very placement as a transitional figure in the discovery and development of evolutionary theory is largely indebted to his insistence on the human's status as a special and separate creation, standing apart and thus able to disinterestedly observe the operations of flux in the natural world. While it is clear that the narrator of *Middlemarch*, whom Beer is here describing, observes a Darwinian world – where plasticity of form is not reserved for geological structures but extends out to include all organisms – the very idea of a narrator being, like Uriel, capable of "watching the progress of planetary history," implies a very un-Darwinian localized disentangling of the web of affinities which binds all of life together. The Uriellian power of observation which Eliot reserves for her narrator reinstates in a post-Darwinian world an Enlightenment-era conception of the human as capable of standing apart, wielding the disinterested analytical gaze of reason upon the observable world.

A possible objection at this juncture might be that in Darwin's own text there exists one such moment of localized disentangling: that is, in the famous "entangled bank" passage which occurs on the second-to-last page of the *Origin*. In this brief but important passage, Darwin muses that "It is interesting to contemplate an entangled bank," thus suggesting a divide between objective scientific gaze and observable nature. What Darwin goes on to describe, however, is the inchoate mess of interdependence, struggle, increase, and decrease that makes up the cross-section of life to which he has turned his attention. He writes:

It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that 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. (459)

Thus the conceit of "contemplation" can be read as much more a rhetorical means of entering into a discussion of the interconnectedness of organisms than a surreptitious admission of a closeted belief in species hierarchy (a belief he *may* have held, as was common among Victorians, but which his theory denied, and which is not convincingly evidenced at any other point in the *Origin*).

The semantic tangle of this passage is itself revealing. Darwin's inability (or unwillingness, since the passage remained very nearly unchanged throughout the book's six editions) to relinquish the terms of an empirical vantage which the phenomena described could only frustrate, stands, by dint of its very obduracy, as a tacit admission of

the limits of human perception against which the scientist of evolution is buffeted. With the word “contemplate” Darwin participates in a fantasy of the “immeasurably patient eye” that Eliot appropriates as his legacy to her narrator in *Middlemarch*. While it is of course true that Darwin’s work in evolutionary theory was defined by an extraordinary patience (the twenty years he took to collect and compare data, to experiment with plant hybridization and animal breeding, readily attest to his forbearance), the “immeasurably patient eye” “watching the progress of planetary history” described by Beer is, crucially, only conceivable in the realm of fiction. For the contemplation imagined in that brief phrase is beyond the grasp of the nineteenth-century scientist of evolution.

That Uriel’s supra-human envisionings cannot stand in for Darwin’s eye observing the natural world might seem to be an obvious point. But the ease with which Uriel’s point of view and the narrator’s perspective on life in *Middlemarch* are aligned demonstrates how in the fictionalization of Darwin’s vision, what to Darwin were insurmountable perspectival limits could, through fiction, be subtly and unceremoniously overcome. Indeed, far in excess of offering sympathetic reflective notice in fiction to a problem obliquely acknowledged in science, the narratives that take up Darwinian concerns tend to dwell in and report from the very vantage point from which the scientist is utterly excluded. The flexibility of the narrator’s expansive and inclusive vision of all elements of life in *Middlemarch* – all the small incipient movements that lead to change in the operations of a village and of the lives that make it up – actualizes Darwin’s fantasy of contemplation. The narrator’s ability to perceive in this way is indeed the foundation upon which the “realism” of *Middlemarch* is built. The narrator’s stated goal, of “unravelling certain human lots, and seeing how they were woven and interwoven,”

(148) relies upon the idea that like a cadaver opened for autopsy, the shiftings and repositionings of human action are observable in what is very nearly real time (in the Darwinian view of time, events of fifty years past, as those of *Middlemarch* are, can readily be thought of as the present).⁴ Eliot's concerns – to map some of the “diffusive” effects of Dorothea's character on the world around her, to closely observe “unhistoric acts” and the “hidden life” which does not leave a monument behind to commemorate it – firmly position the text she produces within the kinds of gaps in history which Darwin's narrative must ford. Eschewing the necessity of a fossil record (so to speak), Eliot's text not only boldly shrugs off the constraints of Darwin's vision, but projects her own vision from the very site whose inaccessibility would most vex the scientist.

Where Darwin is recalcitrant, Lyell is verbose. Although his text betrays his frustrations over the limits of perception, Darwin refuses to address himself directly to the difficulty of observing “what wasn't there and could never be seen.” Long before Darwin had ever thought of transmutation, however, Lyell in his *Principles of Geology* was already considering the difficulty of describing a process of gradual change in the earth's makeup so infinitesimally slow as to be invisible to the watchful eye. For realist fiction to be dwelling in this perceptual zone is a much more Lyellian than Darwinian move. For this reason, I shall now offer a reading of Lyell's concern with questions of perspective, the relationship of literary and scientific narrative forms, and, finally, the illuminating convergences between Lyell's work and Eliot's much-discussed post-evolutionary innovations in fiction.

II.

In the last chapter of the five-chapter historical sketch of geological science that begins his monumental *Principles of Geology*, Charles Lyell rather uncharacteristically adopts a roving narrative voice in order to play out fictions of what he calls the ‘delusions’ of geology’s past (I 76).⁵ Chapter V, entitled “Review of causes which have retarded the progress of geology,” finds Lyell inventing stories of how learned minds might privilege their prejudices in the face of counter-evidence, and concoct extravagant systems to frame material evidence that does not conform to their preconceived ideas of the economy of nature. By this point in the text, Lyell has already elaborated his theory of uniformity in the material realm, his great innovation for geological study, now known as uniformitarianism.⁶ This theory was radical in two significant ways: first, and in place of the biblical timeline (which afforded about a six-thousand-year time-span for all of the events of the earth’s history), Lyell’s theory of uniformitarianism established a new timeline for the earth, stretching “time backward an unknown and [largely] irrecoverable extent”; second, it proposed that all of the changes that had taken place in the earth’s crust were the consequence of ongoing and observable causes. In asserting that the geologist can show that the world has “been the theatre of reiterated change,” and continues to be “the subject of slow but never ending fluctuations,” Lyell asked his readers to see themselves as living amongst the forces of ongoing flux (*Principles* I 73). Chapter V, then, operates as a kind of thought-experiment, allowing the author to assert his authority and overcome his readers’ potential resistance by presenting a variety of ways of seeing that function as straw men beside his own deep geological perspective.

What if science were driven by the precepts of credulity rather than doubt? What if the great minds working in, say, exploring and decoding the antiquities of Egypt, were deluded by an obscuring dogmatism whose weak or insufficient grounds required them to erect “fanciful conjectures” (I 76) in order to explain away the evidence furnished by experience? In Chapter V of the *Principles*, Lyell urges us to imagine the great modern scientific minds in the thrall of misguided belief by drawing out a fantasy of the speculations necessary to counteract the evidence of experience. What would a map of their delusional logic look like? If contemporary scholars of Egyptology, Lyell muses, arrived on the banks of the Nile believing that these had not been peopled before the nineteenth century, what would they make of the mummies they uncovered there, entombed in the ancient-seeming crypts? Lyell suggests a number of extravagant responses to such a troubling discovery: the mummies might be explained away as rejected prototypes of modern man, “abortions of nature” stored underground in much the same way as specimens kept, as if in suspended animation, in formaldehyde-filled jars on laboratory shelves; or they might have been “generated by some *plastic virtue* residing in the interior of the earth”; or again, and taking a turn into science fiction, they might be explained as “the archetypes of men not yet called into existence” (I 77). Perhaps a crypt containing mummies was not a tomb at all, but a curious womb of sorts containing the key to the future face of humanity? “These speculations,” writes Lyell, “if advocated by eloquent writers, would not fail to attract many zealous votaries, for they would relieve men from the painful necessity of renouncing preconceived opinions” (I 78).

Lyell thus suggests that the hallucinations of prejudiced science are triggered by the vertigo of gaps in knowledge. We see what is not there when our field of vision seems

suddenly populated by what is not readily intelligible – and in those moments, we reshape what we see into something we can perceive according to the assumptions to which we cling. The fantasies Lyell invents may be exaggerations, but they exemplify the kind of wit required to fill the space between knowledge and nescience. New knowledge always holds the potential not only to affront, but to seize and overturn what we now know, and so it is not surprising, claims Lyell, that we should seek to overwrite (and thereby undermine) new systems when we encounter them.

Take, for example, Jean-François Champollion, the French Egyptologist whose work in hieroglyphics enabled one of the first translations of the Rosetta Stone, an artifact whose very name has come to serve as shorthand to designate any key to previously unattainable knowledge. Lyell enlists Champollion in his exploration of the alternate nineteenth century – one in which the world’s preeminent Egyptologist observes his subject through a fog of delusion – in order to signal the harrowing threat that misplaced skepticism poses to scientific discovery. If Champollion had beheld the Rosetta Stone and found in it a threat to his position as a knowing subject, he might have recreated it in his own image in order to preserve some sustaining fantasy as to the age of the earth or the timeline along which parts of the globe had been peopled. Champollion stands in Lyell’s text as a signal example of one who overcame the constant potential in science for false iteration: in translating the Rosetta Stone, the key to previously unattainable knowledge, Champollion’s task is to decipher what has been indecipherable, and it is also to resist false iteration – that is, to resist reiterating through the text on the stone the presuppositions he brings with him in his observation of it. Champollion’s task is to don

the mantle of objectivity, even as the epistemological flux to which it leads him serves to erode the epistemic ground he stands on.

And yet ‘objective’ does not quite account for the state of mind Lyell deems necessary for the observation of natural phenomena. Lyell’s text is preoccupied with fictions. His speculations in the first part of Chapter V are neither the mocking voice of the bringer of light who takes a moment in his text to poke fun at wrongheaded fantasies about causality in the material world, nor are they simply examples of the naturalist’s convention of pausing to trace the gradual gaining of ground of a particular system of thought (a convention we find exemplified in Robert Chambers’ *Vestiges of the Natural History of Creation* (1844) and Charles Darwin’s *Origin of Species* (1859), among others). Lyell is not demonstrating the inevitability of his system, in the manner of a teleological model that places his method at the apex of intellectual development in the assessment of change in the physical world. Instead, I shall argue that Lyell’s narrative method in this chapter both explores *and* embodies the revolutions of mind he deems necessary for the acceptance of his new vision of the state of the natural world.

Far from seeking simply to dismantle what he calls “antiquated dogmas” – whether of received knowledge about the age of the world, or of the means by which the great monuments of the natural world came to be as they are, and of the relationship of the present systems in nature to those of the past – Lyell’s text demonstrates his interest in exploring how the mind works to explain what is indecipherable (I 78). As much as Chapter V of the *Principles* is a critique of the delusions consequent upon misplaced skepticism, then – where, in the hands of those “eloquent writers” Lyell so deplors, credulity masquerades as skepticism in the service of an overarching belief in a restrictive

causal narrative – it is also the site of Lyell’s development of his concept of the perceiving consciousness necessary for the recognition of the laws governing geological phenomena. This consciousness balances on a knife’s edge, *between* credulity and skepticism. It rejects both extremes. Lyell’s narrative method in this chapter is, from the outset, to use the means of imaginative literature to highlight the shortcomings of perception in empirical science. The fictions of self-deception that Lyell conjures serve the larger function of enabling him to begin the work of narrating the contours of a state of consciousness more suited to fiction than to science. Lyell uses the fictions of self-deception to acclimatize the reader, to prepare her for his inward turn, where the geologist will offer a picture of the crisis he faces when confronted by the gaps in his own knowledge. I shall argue that Lyell’s fifth chapter represents the scientist’s confrontation with and mastery over those moments in scientific theorization at which empiricism must give way to fiction. In drawing out stories of self-deception, Lyell begins the difficult work of expressing the state of a mind confronted with gaps in available information on an enormous scale. He begins by addressing himself to the misguided speculations of adherents to “antiquated dogmas,” but he goes on to confront the gaps in his own knowledge, and to suggest that as incipient science builds bridges out into the dark,⁷ the methods of fiction will offer the means with which to begin the difficult work of seeing through the obscurity.

III.

Lyell's theory of uniformitarianism states that geological phenomena must be explained according to known and observable causes. His theory hinges upon the claim that the material world has been subject to "one uninterrupted succession of physical events, governed by the laws now in operation" (*Principles* I 144). As James Secord notes, Lyell's sustained argument in the *Principles* is that "We can see [...] forces adequate to produce the Andes and the Alps, especially if the cumulative effects of time were taken into account" (xvii). But Lyell must admit, as he does in the fifth chapter of Volume 1, that since "we cannot watch the progress of their formation" – that is, the formation of new strata – "and, as they are only present to our minds by the aid of reflection, it requires an effort both of the reason and the imagination to appreciate duly their importance." Then he adds with chagrin: "Our position as observers is essentially unfavorable" (I 81). Put simply, the geologist's dilemma is this: though the present affords us the perspective to observe the forces adequate to induce change in the physical world, our own physical limitations mean that we cannot observe this process in all its drawn-out sequentiality. Lyell continues:

He who has observed the quarrying of stone from a rock, and has seen it shipped for some distant port, and then endeavours to conceive what kind of edifice will be raised by the materials, is in the same predicament as a geologist, who [...] beholding a volcanic eruption [...] tries to conceive what changes the column of lava has produced, in its passage upward, on the intersected strata (I 81).

Lyell's theory, as Isobel Armstrong playfully notes, seeks to make sense of "a world of non sequitur" (262). To follow its posited path of uniformity, then, Lyell's text must somehow ford the many insuperable gaps in the fossil record.

Owen Anderson writes that "Lyell's principle requires a radical form of empiricism," because so much of what it seeks to interpret is not itself empirically verifiable (454). But rather than give his theory over to non-empirical interpretive principles, Lyell embarks on a careful delineation of the means by which the mind may come to know what is not necessarily verifiable. Quarrying his own processes of thought, he carefully delineates the problem of witnessing in geological science, explicitly abiding in the geologist's inability to witness the developmental process he describes:

We are called upon, in our researches into the state of the earth, as in our endeavours to comprehend the mechanism of the heavens, to invent means for overcoming the limited range of our vision. We are perpetually required to bring, as far as possible, within the sphere of observation, things to which the eye, unassisted by art, could never obtain access. (I 83)

In the service of exploring the limits of the geologist's range of vision, Lyell enlists in Chapter V three fictional creatures, each of whom inhabits a *milieu* from which the geologist's gaze is excluded, to provide a narrative of sorts of the world as they might see it. What if, he muses, "we were inhabitants of another element" (I 81). The 'assistance of art' here takes the form of a fantasy of seeing the world from other points of view. For a brief two pages, Lyell's own narrating voice gives over the smooth veneer of a paced, Whiggish style of composition in favor of a narrative condition of shifting mobility.⁸ Like the physical world whose processes he describes, Lyell's narrative is here governed by

what Armstrong characterizes as Lyell's vision of the world's continual state of repositioning (262).⁹

Lyell imagines an amphibious creature, possessed of the same faculties as he. He acknowledges that "the reader may, perhaps, smile at the bare suggestion of such an idea," but forges ahead, setting the stage of his strange theatre with the props of geological knowledge (I 82). The amphibian possessed of reason would, he muses, "more easily arrive at sound theoretical opinions in geology, since he might behold, on the one hand, the decomposition of rocks in the atmosphere . . . and, on the other hand, examine the deposition of sediment in the sea, and the embedding of animal remains in new strata" (I 82). Adaptable and mobile, the amphibian is by definition a creature who enjoys two modes of existence – who lives two lives. "Amphibian" is derived from the Greek *amphibios* which combines *amphi* (meaning "both," "on both sides," and "around") with *bios* (meaning "life"). Through this creature Lyell imagines setting aside the *human* point of view, which is constricted to "the narrow limits of the land" (I 81). Shortly before allowing himself to fantasize his way out of his perspectival limits, Lyell laments: "We inhabit about a fourth part of the surface; and that portion is almost exclusively the theatre of decay and not of reproduction" (I 81). Through the amphibian, the geologist imagines a key to previously unattainable knowledge; he is able to imagine intimacy with an element normally beyond the bounds of human habitation, and to fantasize a means of filling in the gaps in knowledge – of transcending the vertiginous condition of geological perspective. The amphibian, he writes, "might ascertain, by direct observation" processes that the geologist is forced merely to deduce from general principles (I 82).

Confronted with gaps in knowledge on an enormous scale, Lyell faces a crisis in perspective. Through three fictional creatures the geologist openly acknowledges how his theory of the shifting condition of the physical world might itself initiate a crisis of point of view in the reader. As the first in the series of creatures through whom Lyell highlights the contingency of his own point of view, the amphibian is joined in the narrative by the creature Umbriel, whom Lyell borrows from Alexander's Pope's *The Rape of the Lock*, and then by a Gnome. Umbriel, a creature "entirely confined to the nether world" offers a supplement to the amphibian's mobile gaze. Umbriel, that "dusky melancholy sprite" is imagined by Lyell to be a creature intimate with the inner workings of the globe. Privy to the operations of the inner structure of the earth, Umbriel might devise a system of thought to explain "the stratified rocks, containing shells and other organic remains" that he would there find (I 82). And like Umbriel, the Gnome provides a figure through whom Lyell can open his eyes underground, and consider how stratified rocks ("curiously bedded formations") might be evaluated by creatures privileged to live within them (I 83).

Through the three creatures, Lyell lends his text a depth of field which, up to this point, his own, more searching scientific gaze has not been capable of providing. And yet, with all its advantages, we are told that Lyell's amphibian cannot know for sure how "rocks of subterranean origin" would have come to be as they are. Seeking in vain, "within the sphere of his observation," the amphibian would not, Lyell insists, be able to draw an analogy between the processes he observes in motion, and the monuments of past activity he imagines to be still and fixed. He would, thinks Lyell, naturally ascribe those rocks of subterranean origin to some "primeval state of nature." Like the

amphibian, Umbriel, “who could ‘flit on sooty pinions to the central earth,’ but who was never permitted to ‘sully the fair face of light,’ and emerge into the regions of water and of air,” is, for all his access to the inner structure of the globe, fundamentally disadvantaged by his restriction to one elemental realm. The Gnome, too, for all that he may behold the “curious impressions and fantastic markings” of embedded rocks, is marked-out by Lyell as a victim of the limits of his sphere (I 82). Though all three creatures would *seem* to have access to theatres of reproduction – domains where strata are embedded, or from whence earthquakes emanate and volcanoes spring – they are each in turn imagined to be insensible to what Lyell calls their “natural disadvantages” (I 83).

Though each of these creatures is marked out as a privileged witness, dwelling in a theatre of reproduction rather than decay – each has the potential to *behold* the action of the world repositioning itself – they are also each delimited by what Lyell takes to be the natural condition of one’s position as an observer. That is to say that each creature, it is predicted, would imperfectly estimate the result of operations invisible to his sight. Not only, then, is Lyell shedding light on the contingencies of his own point of view, but he is highlighting the contingency of all other points of view as well. This rhetorical move allows Lyell to make a key assertion in his text, and to claim a privileged place for himself in the accounting for causes of change in the natural world. He writes, “It is only by becoming sensible of our natural disadvantages that we shall be roused to exertion, and prompted to seek out opportunities of discovering the operations now in progress, such as do not present themselves readily to view” (I 83). The special work of reflection, the combined “effort both of the reason and the imagination,” that Lyell has by this point listed as being part of the geologist’s interpretive arsenal is what differentiates him from

the creatures privileged to witness and collate the processes of nature. He imagines a series of three creatures with great observational advantages, but the *coup de grâce* comes when the reader discovers that Lyell is here inscribing himself into the text as a fourth creature. His special advantage is his imagination. Imagination, he suggests, enables us to overcome our creaturely contingencies. Imagination is the art we bring to our observations. Though our literal purview be limited, we are endowed with a special inner faculty of sight.

The geologist's task is to observe the operations of a world that slips continuously out of focus, moving, as James Krasner writes, "out of range of the mind's eye" (124). But before that, the geologist must possess the visionary imagination that will enable him – to adapt Walter F. Cannon's phrasing – to look at an apparently rigid structure, and see a plastic one.¹⁰ The amphibian, the creature Umbriel, and the Gnome are bereft of this visionary imagination. The "living language" – as Lyell calls it – of the natural world is *unimaginable* to them (I 73).

It must be acknowledged, however, that Lyell's narrative imagination – in seeing through the eyes of his creatures – is constrained by a certain unwillingness to fully immerse himself in seeing from their points of view. The observations of strata from which the geologist is excluded (underwater sedimentation, underground repositionings, and the "curiously-bedded formations" of the Gnome's environment) are narratively and syntactically confined to the conditional form. The perceptual actions Lyell ascribes to the amphibian, Umbriel, and the Gnome are always framed by conditional verbs. "Might" continually reappears in the text to connote a possibility as distinct from a certainty. The creatures are always spoken of in the third person, and hypothetically; no attempt is made

to adopt a first person point of view in the voice of any of the three creatures. Such one-dimensional forays into alternative points of view might be taken as a sign of the failure of Lyell's imagination to fully adopt a plasticity of vision characteristic of imaginative literature. After all, Lyell does not actually open his eyes underground as the creature Umbriel, or as the Gnome. His interest is not to *become* amphibian. I would argue, however, that rather than denoting a failure – either in narrative terms: to fully adopt another point of view, or in imaginative terms: to display a willingness to stretch his mind – Lyell's refusal to fully immerse himself in these other points of view is strategic. First, the geologist who seeks to establish his field of research as a discrete area of science may not want to diminish his credibility by appearing to give over to caricatures and fantasies. He will not ascribe imagination to creatures that are not human. But more importantly, Lyell's interest in this chapter is to establish a roving narrative eye, one which multiplies possible worlds through narrative imagination.

Lyell's distanced narrativizations – his insistence on the third person – allow him to retain his semblance of objectivity while exploring alternate subjectivities. This rhetorical strategy is what allows Lyell to see plasticity in the natural world without himself becoming subjected to the implications of this model for geological change. Lyell's "undulating mountains and valleys" may slip in and out of focus (indeed, the very act of saying "undulating mountains and valleys" is, after all, a notation for thousands of years of geological metamorphosis, most of which is not clearly recorded in stratifications), but the geologist's gaze will be steady (Krasner 124). Lyell's work in this chapter finally sees the geologist narrating himself overcoming the limits of perception. He does this through a neat elision of the limits of his field of vision. Lyell's radical

empiricism takes the form of a willingness to dwell in the space between knowledge and nescience, where the imagination may fill in the gaps between fragments of available data. He writes:

The variations in the external configuration of the earth . . . which the geologist beholds when he restores in imagination the scenes presented by certain regions at former periods, are not more wonderful or inexplicable phenomena, than are those which a traveller would witness who traversed the globe from pole to pole (I 159).

The geologist is faced with the daunting task of deciphering continuity in a body of evidence that seems to spell out a language of discontinuous fracture. His work is to find a way to see how formations separated by millions of years of shifting actually coexist within a single system of uniform repositioning. The doctrine of uniformitarianism requires that the observer be able to see an unbroken continuity in a world of non sequitur. “Non sequitur” means in two senses here: first, that the fossil record is incomplete and so speaks in fragments, and second, that the strata that do exist can elude the observer and appear to be the monuments of utter fracture and diversity. The geologist, then, must “restore in imagination” a picture of a collated world, where corresponding parts are linked with the connective tissue of his own mind.

But *restoring* in imagination implies a reestablishment, the renewal of an original condition: a reconstruction. Lyell’s geological perspective (what James Secord calls his “perceptual reform” (xx)) is built on a rather Platonic notion of *anamnesis*, that all knowledge is remembrance; all seeing is restored vision. And yet the Platonic model of how the philosopher calls things to mind is (in *Phaedo*, and by inference, in *Meno*) based

on the precept that all knowledge is gained through the faculty of reason.¹¹ Lyell's curious thought system, the "effort both of the reason and the imagination," builds a bridge between empiricism, which dictates that our experience is the only source of knowledge, and a kind of anamnestic system, through which we may call to mind an original condition of knowledge, or sight (I 83). In other words, Lyell's radical empiricism imagines a way to light the path of incipient science, whose task is to build bridges out into the dark. As with Coleridge's understanding of the secondary imagination as a vital power, able to recombine ideas and images into new and living forms, Lyell's geological perspective sees in the imagination the power to restore observations of fractured natural phenomena into an unbroken, or *uniform* shape.

Mary Warnock writes that the imagination "is necessary [...] to enable us to recognize things in the world as familiar" (10). To "restore in imagination" scenes from the geological past is to recover familiarity, to make the world and its repositionings canny. I would like to suggest that this phrase, and the sentence it occurs in, can stand as a demonstration of how the imaginative matrix of Lyell's geological perspective works to bring together things not – to use Darwin's phrase – "closely consecutive" into the collated whole that is his text (*Origin* 299).¹²

Firstly, Lyell says that "the geologist *beholds* when he restores in imagination" the scenes of the past unavailable in living memory or recorded history. These scenes, we are told, can be likened to those witnessed by a traveller, traversing the "globe from pole to pole." Lyell here conjoins two axes of measurement, linking a vertical motif to a horizontal one in the same sentence. The geologist's restorative imagination, which operates on a vertical, or temporal axis (tracing the stratification of the earth's matter

back over eons), is joined with the traveller, who operates on a horizontal, or spatial axis (traversing the earth's surface in a single narrow era). Lyell's mobile narrative imagination – the plasticity of his rhetorical movement – dissolves what would seem to be the incommensurable directional divide between the axes, moving his reader comfortably through what amounts to a rather drastic imaginative leap.

As a result, Lyell's text establishes a narrative system whereby he – geologist, perceiver, author – performs a restorative and unifying function. Just as he retains his semblance of objectivity even while exploring alternate subjectivities, he is able to occupy the position of fixed entity throughout a text that posits a depth of time so vast as to threaten the radical destabilization of the perceiving subject. In this respect Lyell's narrative feat stands as both remarkable and dubious: remarkable because he manages to remain for himself and his reader a coherent imaginative force amid narrations of “ceaseless subsidence, upheaval, displacement and transfer of the earth's matter” (Armstrong 262); and dubious for much the same reason. For in refusing to allow the implications of his theory of uniform change to erode either his own narrativized subjectivity or humanity's status as a special creation exempt from the regulatory force of natural law, Lyell willingly persists in a fiction of humans as primarily *moral* rather than physical beings. A fiction necessary to Lyell, but one which Darwin (his most notable inheritor), would go on to expose as an antiquated dogma unworthy of the revolutions of mind Lyell's theory of uniformitarianism had helped to inaugurate. And yet it is because of Lyell's commitment to reifying the human as a special, separate, and fixed creation that he ascribes to the human observer the work of the imaginative reconstruction of a

past which exceeds human observation in both its remoteness and non-sequentiality. The geologist who restores in imagination enjoys a transcendent capacity for collation.

I have mentioned Coleridge's secondary imagination in passing, but the connection between the Lyellian geological imagination and the Coleridgean poetic imagination deserves further notice. When, in his late notebooks, Coleridge came to sharpen his teeth on Lyell's theory of uniformitarianism, his antagonism toward Lyell's dismissal of the 'truths' of "progressive Zoogeny," which, in his view, left "a craving void for every philosophic Mind," blinded Coleridge to the degree to which Lyell's vision of the slow, uniform, and constant processes of upheaval and subsidence in the earth's strata was actually deeply indebted to a mode of thought closely resembling Coleridge's own concept of the vital and generative power of the secondary imagination (*Notebooks* 6713, 6597). Coleridge's complaint against Lyell arose largely from his own preoccupation with origins – a philosophico-poetic propensity he systematized in his *Biographia Literaria*.¹³ Lyell's theory of uniformitarianism, which arose out of the work of the geologist James Hutton – who famously declared that he saw "no vestige of a beginning, no prospect of an end" in the operations of earthly flux – refused to bring the same inductivist reasoning he applied to processes of upheaval and subsidence of strata to the yawning question of genesis (*Theory* 96).¹⁴ In other words, Lyell's theory provided an account of processes already underway, declaring that the systems we observe today (volcanic eruption, erosion, sedimentation, earthquakes) are the same systems which have always governed changes in the geological realm, and that we have insufficient information upon which to build a picture of an original state.¹⁵

For his part, Coleridge sided with the catastrophist vision of the earth which Lyell's *Principles* sought to undermine. Whereas Lyell's vision focussed in on process, the catastrophists, most famously Abraham Gottlob Werner and Georges Cuvier, provided an account of cataclysmic and other sudden, violent punctuating events which can be seen to simultaneously demarcate end- and beginning-points. Whereas Coleridge had hoped to find in Lyell's text a system through which to consider genetic progression in nature, or a methodology for theorizing a synergy between successive epochs in the geological (geogony) and animal (zoogeny) spheres, what he encountered there was an explanation of all the earth's systems as "merely cyclical—like those of the Tides, the Seasons, &c &c, and disguised from us by the greater length and amplitude of the Cycle" (*Notebooks* 6713). The "craving void" Lyell's theory left for Coleridge's "philosophic Mind" can be traced to its privileging of cyclicity over the clearly demarcated event. Coleridge's work is filled with events: from the wind/universal mind operating upon the harp/poetic imagination in "The Eolian Harp," to the "secret ministry" of frost/inspiration moving "Unhelped by any wind" to act on the window/mind of the poet in "Frost at Midnight," to the mode of the secondary imagination's operation, which "dissolves, diffuses, dissipates, in order to recreate" in *Biographia Literaria*, Coleridge is broadly committed to querying the happening of thought (*Poems* 46; *Biographia* 202).

To Coleridge, Lyell's plan for change in the natural world would seem to foreclose the operations of the philosophic mind which looks for the happening of natural processes, always seeking a vital connection between living nature and thought process (and thus unearthing the correspondences between human nature and Nature at large). In his sketch of the secondary imagination in *Biographia Literaria*, Coleridge imagines a

union between the poet as a living and creating being, and the generative forces – building even out of dissolution – which he finds everywhere in nature. The imagination, he writes, “is essentially *vital*”(202). So, in his private musings, Coleridge turned to the catastrophists, whose model of successive violent events of dissolution and repositioning appeared better suited to his own conception of the creative vitality of the imaginative faculty, with its essential processes of diffusion and reconstruction. But what Coleridge did not perceive is that the *happening* he craved occurs in Lyell’s text in the form of the geologist’s imaginative act of interpretation. This chapter has explored how Lyell’s theory of uniformitarianism is built upon an original act of imaginative retrieval, in which, in true Coleridgean form, the geologist exercises mastery over the past through his imaginative reconstruction of prehistory, where “history” is understood to mean “belonging to human time.”¹⁶ In the absence of a complete fossil or strata record, Lyell’s mind acts as the site of productive connectivity, and he generates a connection between himself as an observer and the unobserved past. To adapt what Michael John Kooy has shown in his reading of Coleridge’s Romantic historiography, this striving to “relive the past in individual consciousness” (717), to retrieve what is incommensurable to experience, and to forge a creative encounter with the past, is intimately connected to Coleridge’s concept, from *Biographia Literaria*, of the transcendental philosopher, who begins his thought-journey with intuition and moves latterly to matter.

Whether Lyell read Coleridge’s *Biographia Literaria* is unclear, though a letter to his father shows that he read, and disliked, “Christabel” in 1816, and, with a casual reference to the “Lake Poets,” the same letter speaks to his familiarity with their productions (*Life* 36). It is likely that Lyell – brought up by a father whose translation of

Dante's *Inferno* garnered critical esteem – was at least aware of Coleridge's philosophical musings. Since the poet's historiography is drawn largely from his notebooks we can be sure Lyell was unacquainted with it as such, but Coleridge's concept of the potential for a creative aesthetic encounter with the past is not far distant from his notion of the poet's trembling responsiveness of mind in the act of perception, described in "The Eolian Harp." Like the poet-figure in "The Eolian Harp," who, bathed in the aromatic infusion of jasmine and myrtle (which herb etymologically signals "the sweet gale" of inspiration operating on the poet), and who comes to perceive "A light in sound, a sound-like power in light, / Rhythm in all thought, and joyance everywhere—," thus gaining entry into the life of things, and insight into the music of nature's heartbeat, Lyell's mental traveller transcends the limits of perception and sees into the perfect symmetry and unity described in Coleridge's poem (*OED, Poems* 46, l. 29-30).¹⁷

The mental traveller who "restore[s] in imagination" unifies, through the connective propensities of the mind, the apparently discontinuous occurrences of the past, 'restoring' them to the individual's memory bank and making them available to mental visitation. As early as 1827, in his review of Scrope's *Memoir on the Geology of Central France* for *The Quarterly Review*, Lyell made the mental traveller central to his geological imagination.¹⁸ There he writes that the scenes of the past may be "restored in imagination" through the extension of the scientist's thoughts into the past, resulting in the inclusion "within the compass of our rational existence, all the ages, even though they be myriads of years" (*Memoir* 441, 474). The spatio-temporal range of Lyell's mental traveller, whose journey joins material nature and metaphysical thought, has much in common with the dual philosophical journeys Coleridge contemplates in *Biographia*

Literaria. There, he speculates two key approaches to thought through the figures of the natural and transcendental philosophers, the former moving in thought from the natural to the supernatural, and the latter making the reverse journey. If both philosophers successfully complete their journeys, they will meet in the middle, at a metaphysical nexus of the general and the specific. Coleridge could not see it, but Lyell's mental traveller in many ways embodies this metaphysical nexus as he successfully joins two axes of measurement through the visionary operations of a geological imagination.

IV.

In the third volume of the *Principles*, we find an excellent example of the Lyellian work of restoring in imagination. He writes that

the sediment of the Rhone, which is thrown into the Lake of Geneva, is now conveyed to a spot a mile and a half distant from that where it accumulated in the tenth century, and six miles from the point where the delta began originally to form. We may look forward to the period when this lake will be filled up, and then a sudden change will take place in the distribution of the transported matter; for the mud and sand brought down from the Alps will thenceforth, instead of being deposited near Geneva, be carried nearly 200 miles southwards, where the Rhone enters the Mediterranean. (III 27-8)¹⁹

The events described in this passage reside primarily in the time of history – that is, in what Lyell thinks of as human time.²⁰ Analysis of sedimentation patterns has determined

the originary mouth of the Rhone, and enough scientific evidence exists at the time of composition for Lyell to forward the thesis that since the formation of the delta and the Lake of Geneva, the deposit-point of sediment has gradually been pushed ever southward. This element of Lyell's analysis stands as an application of Hume's "second source of knowledge," which Hume calls "matter of fact and existence" (12:3 123).²¹ Empirical data is accumulated through the scientist's experience and observation of the world, which then allows him to project what he observes into laws about cause and effect. In 1818 Lyell visited the Rhone valley and the Lake of Geneva.²² Observing a tributary to the nearby Aare river, he saw first-hand the pulverizing effect of moving water, as it swept silt, and great clumps of mud and rock downstream right before his eyes (Bailey 43). Combining this kind of experiential knowledge with careful collation of extant data to forward hypotheses of cause and connection is the essential work of empirical science; it is at the heart of both Baconian and Humean philosophy of science, and it was the practice of Lyell's most notable predecessors, including the geologist James Hutton. But Lyell's narration of sedimentation in the Rhone valley is notable for the complex ways in which, with a great effort of "both reason and the imagination," he manipulates the precepts of empirical epistemology (I 81).

As James Krasner has pointed out, the passage is remarkable for its simplification of "geological processes into imageable arcs of motion: the sediment of the Rhone is 'thrown' into the lake of Geneva; soon the lake will be 'filled,' at which point the deposits will be 'suddenly altered,' and the river will 'carry' them farther southward" (124).²³ Though the movements described carry over a comparatively narrow schedule of change, they still represent hundreds of years of slow erosion. According to Lyell's own

hypothesis, in which nine centuries (since the tenth to the nineteenth) were required for a one-and-a-half mile southward shift of the deposit site for the Rhone's sediment, the two-hundred-mile shift he so blithely predicts – if the current rate of sedimentation, erosion, and gravitational pull were to remain constant (and Lyell's theory of uniformitarianism proposes that they should) – would take approximately 133 times the length of time calculated for the change between the tenth and nineteenth centuries.²⁴ In other words, a 200-mile shift of the Rhone's sedimentary deposit should take about 1,200 centuries, or 120,000 years. Compared to the millions of years of slow, imperceptible change that caused the Rhone valley to exist in the first place, the 120,000 years needed to shift the Rhone's sediment to the Mediterranean is a barely perceptible blip. But to a readership used to thinking of the earth as a six-thousand-year-old body, one can imagine that a full awareness of the schedule for change that Lyell is narrating would at the very least offer a discomfiting prospect.

But as Krasner suggests, Lyell's narrative acceleration of the process positions it within our visual field, lending it a cinematic quality. The result is a panorama of metamorphosis which, as Krasner notes, occurs in the text without “disturbing the reader's sense of equilibrium” (124).²⁵ This is in part because the narration offers an invisibly sutured composite of time, inviting the reader to think in the continuous terms of a narrative at ease in expressing in one breath the deep past, the recent past, the present, and the future, but also because it iterates events of geological change in the vernacular of human action. Nature neither throws, nor fills, nor carries. And while time, in the language of uniformitarianism, is vast and barely assimilable, in Lyell's telling of sedimentation in the Rhone valley, time is foreshortened: it is conveyed in personified

bursts of activity. The language of this passage lends the natural element the qualities of an agent of change.

It should be noted that while there are countless alternatives to Lyell's narrative style, none can offer a transparent representation of uniformitarianism. For uniformitarian processes are necessarily condensed through their narration, since to narrate them on their own schedule would take thousands of years. So although a temporo-narrative acceleration is necessitated by the very act of telling the story of uniformitarian change, Lyell's choices demand attention for their arresting interweaving of the rhetorical strategies of literature with the facts of empirical science. His use of the passive voice, for example (sediment *is thrown* into the lake and is then *conveyed*; the lake will be *filled up*), both acknowledges a lack of agency behind natural events – sediment *is thrown* because Lyell's theory removes a *primum mobile* from the ongoing events of geological change – and allows the author to isolate geological processes as coherent events, and to arrange them sequentially as discrete actions. Thus the narrative acceleration which is arguably necessitated by temporal characteristics of the thing described, itself necessitates the passive voice, whose work is in large part to acknowledge the absence of a distinguishable or nameable causal force. The final effect is the transformation of event into narrative; for in singling out geological processes as events Lyell is then able to join these in the connective tissue of an integrated story. The concept of *action* enters the text only through the process of narration: it is only in telling the story of geological processes that the velocity of action verbs figure in relation to indifferent, which is to say non-intentional and non-directional, natural occurrences.

The object of the passage is primarily to forward the simple thesis that gravity will eventually urge the sediment through and beyond the lake's cavity, and all the way to the Mediterranean, where it will be deposited no one knows where. Lyell's facility for dodging the potentially dislocating effect of representing the events of deep time – the three volumes offer a remarkably succinct exposition of the huge impersonal movements of erosion, sedimentation, and the heating and cooling of the earth's crust – enables the narrative to offer itself up as a coherent notation of incoherence. In the interest of this, the narration performs a mimetic function, one in which temporal coherence is achieved through the schematization of geological events according to the vernacular of human action. In establishing indifferent geological movements and fluctuations as elements of a causal chain, Lyell's narration of geology, which transforms occurrence into event, and event into sequence, imaginatively links the geological processes under study with the literary principles that govern plot, or the narrative fabric that grasps together miscellaneous events into a sequence.

My definition of narrative is largely indebted to Paul Ricoeur's work in the second volume of *Time and Narrative*.²⁶ I propose that Lyell's description of the transportation of matter, which grasps together the scattered events of slow geological change, and weaves them into a coherent accelerated narrative time, constitutes a Ricoeurian emplotment of the occurrences of the natural world. While even Hume acknowledged the necessary fictions of the imagination which allow the scientist to perceive similitude in nature and thus to project the mind outward from experience to the formulation of laws about cause and effect, Lyell's emplotment of geological changes (in the Rhone valley, for example) evinces his willingness to stretch the boundaries of

empiricism (further, at least, than Hume's definition would allow),²⁷ and clear a space for the literary imagination in scientific storytelling (Warnock 71). In Lyell's text, the literary imagination and the empirical method work coterminously.

Ricoeur defines narrative as a "productive invention," where scattered events are grasped together and integrated into a unified whole (x). Lyell's work in the above passage, and elsewhere in the *Principles*, is to transform event (empirical evidence) into narrative (the theory of uniformitarianism): to make pictures out of pixels. The story of geological change is passive and achingly slow, and Lyell's work operates to grasp together (to use Ricoeur's formula) the miscellany of scattered events, and, through the use of the techniques of imaginative literature, to overcome the resistance of the things described by transforming them into something else. For Ricoeur a defining characteristic of narrative is the space it clears for metaphor, which, he says, is the key to overcoming the resistance of a thing (which might be considered as the uniqueness, or coherence, or apparent singularity of a thing) in the work of ordering the world through the imagination (x).

Since, as Lyell says, the scientist's position as an observer is unfavourable, human observation is, in the *Principles*, bolstered by the props of the imagination: by metaphor, and analogy. These tools of narrative enable the scientist to coherently textualize a temporal incoherence. This is the work of emplotment: events divided by eons of slow change are grasped together and made intelligible in their narrativization. Punctuation stands in for great lapses of time, and coordinating conjunctions suture together seemingly insuperable gaps in the fossil record. The passive voice allows the narrator to

speak of actions without actors, and the non-events of geology are framed in the terms of history.

In Ricoeurian terms, Lyell's text operates as an analogy for geological change, and uniformitarianism is the metaphor which allows Lyell to overcome the resistance of the discrete events of the geological past. In other words, the indifference of geological fluctuation, the enormity of the schedule for change to which Lyell wishes to address himself, become malleable when he introduces the narrative concept of uniformitarianism. A chaos of pixels becomes a picture when uniformitarianism orders events into a conceptual coherence.

And yet, a picture, like a pixel, offers a static agglomeration of multiple elements. In a picture, all the parts are gathered together, and all may be observed, though not all at once. So the term inadequately describes the work of the geologist building a story out of disparate puzzle pieces. Lyell's text aims to deliver a linear construction of data that is given the geologist non-linearly. To produce smooth linearity – sequentiality – from simultaneity, or to build a story of slow insensible change from the evidence of strata which heap together layers of random fragments of the detritus of the ages, is to produce more than a picture, for Lyell must reach past the structure of the thing described and transform picture into narrative.

V.

The work of narrativizing uniformitarianism, then, requires two distinct perspectival adjustments. Gazing at a cliffside, like those lining the Dorset coast or great

swaths of the North Sea coastline near Edinburgh, both areas with which Lyell was familiar, the eye perceives monuments of distinct geological eras in contact with one another: millions of years of slow change may be framed in the cross-section of a cliffside. The first task of the uniformitarian geologist is to resist being seduced by the appearance of abbreviated time. He must, as Lyell does, first greatly expand the picture of geological formations until it becomes a much less appreciable mess of incoherent pixels. He must take the dense, abridged and static shorthand offered up by the cliffside cross-section and revert it to the comparatively incoherent story of unimaginably slow, impersonal change – retracting his gaze, so to speak. The second perspectival adjustment is made in the transformation of the story of geological flux (the multiple scattered events of eons) into the emplotment of uniformitarianism (which grasps these scattered events together into an integrated narrative). As such, in the observation of geological phenomena, flexibility of mind and a willingness to engage in thought experiment are prerequisites. And while he is only ever able briefly to pause in observing the natural disadvantages suffered by the geologist, in the first volume of the *Principles* Lyell repeatedly acknowledges the difficulty of his limited observational scope. In Chapter IX, Lyell returns to the issue of beholding but, as his object is to forward a confident theory of geological development, he can only gesture obliquely to the difficulties facing a scientist who must greatly rely on his ability to relate convincingly what his imagination may seize but his eye cannot behold.

Four chapters after his meditation on Umbriel, the amphibian, and the Gnome – privileged witnesses all – Lyell returns in Chapter IX to a consideration of the delusions

potentially enacted on the mind by way of the senses. Beginning with a lengthy citation from Paley's *Natural Theology* (1802), he writes:

‘In our globe,’ says Paley, ‘new countries are continually discovered, but the old laws of nature are always found in them: new plants perhaps, or animals, but always in company with plants and animals which we already know, and always possessing many of the same general properties. We never get amongst such original, or totally different modes of existence, as to indicate that we are come into the province of a different Creator, or under the direction of a different will. In truth, the same order of things attends us wherever we go.’ But the geologist is in danger of drawing a contrary inference, because he has the power of passing rapidly from the events of one period to those of another – *of beholding, at one glance*, the events of causes which may have happened at intervals of time incalculably remote, and during which, nevertheless, no local circumstances may have occurred to mark that there is a great chasm in the chronological series of nature's archives (I 159; emphasis added).

Beholding the monuments of the past, the eye will tend to collapse time into a neat succession of events. Gradualist and actualist principles must be imposed upon the senses so that the perceiving eye observes not only what is there but detects also what is missing from the appearance of chronology. Thus the empirical method of the uniformitarian geologist requires him to see past the scene afforded him by nature, and to construct another world altogether. Lyell writes that the geologist will “reason from analogy, by the strict rules of induction, respecting the events of former ages, or, by a comparison of the

state of things at two distinct geological epochs, to arrive at the knowledge of general principles in the economy of our terrestrial system” (I 165). Recalling Humean empirical principles by framing this assertion in the grounding terms of the “immutable constancy” of the laws of nature (I 165), Lyell yet asks his reader to think past Hume; to take as a grounding principle that the imagination, as Hume writes, “can never exceed the original stock of ideas furnished to it by the internal and external senses,” and that “every idea is copied from some preceding impression or sentiment” (5:2 39, 7:2 61), and yet to exalt the mind as capable of restoring in imagination “the appearance of the ancient continents which have passed away” and whose traces may not even have left a skeleton from which to project their form (*Principles* I 165).

Thus the geologist’s essential work is to “imagine what wasn’t there and could never be seen”; these are the words of George Levine on Darwin’s perspectival revolution, but the characterization applies equally well to Lyell – as does what Levine goes on to say of Darwin, that his “imagination actually defied the experience that Baconian [and, we may add, Humean] theory privileged” (*Darwin* 1). Lyell did this long before his famous colleague; and like Darwin’s, Lyell’s theory – which claimed that “one uninterrupted succession of events, governed by the laws now in operation” had brought about the present world – enlarged the scope of empiricism by carving out a more prominent space for knowledge acquired through imaginative extrapolation, that is, for the unverifiable (I 144). Unlike Darwin’s, Lyell’s text *dwells* on the destabilizing effect of extrapolating from the visible world the story of its deep past. And yet, as he did in Chapter 5, in asserting the human’s ability to “invent means for overcoming the limited range of our vision,” Lyell recuperates his authoritative and more distanced tone after

confessing to the perspectival vertigo of “beholding, at one glance” the events of the deep past crowded together, by once again exalting the extraordinary power of the human mind. As if to soothe both himself and his reader, he writes:

Although we are mere sojourners on the surface of the planet, chained to a mere point in space, enduring but for a moment of time, the human mind is not only enabled to number worlds beyond the unassisted ken of mortal eye, but to trace the events of indefinite ages before the creation of our race, and is not even withheld from penetrating into the dark secrets of the ocean, or the interior of the solid globe; free, like the spirit which the poet described as animating the universe,

Thro’ Heav’n, and Earth, and Oceans depth he throws
His Influence round, and kindles as he goes. (I 166)²⁸

While Hume himself wrote that “nothing is more free than the imagination of man,” he nevertheless insisted that the imagination is excited by the “particular situations in which the mind is placed,” which is to say that the imagination is delimited by the “original stock of ideas furnished to it by the internal and external senses” (5:2 39-40). In keeping with Humean empirical parameters, Lyell’s actualism enabled him, in the words of Michael Ruse, to “explain past geological phenomena in terms of causes of the kind that are operating at present” (121), and his gradualism allowed him to declare that the forces at work in shifting and repositioning the earth operate at an infinitesimally slow pace, and while these two theories together offered a strong base from which to extrapolate about geological phenomena, Lyell was nevertheless constantly faced with a subject of inquiry characterized more by absence and lacuna than by presence and evidence. In other words,

Lyell's imagination, and through it his ability to conjure, by way of inductive reasoning, the missing pieces in the huge puzzle before him, and to negotiate the misunderstandings of his senses (in Virgil's terms, "kind[ling] as he goes"), played a much larger part in his scientific method than Hume's or Bacon's philosophies could anticipate.

Lyell's willingness to "imagine what wasn't there and could never be seen" laid crucial imaginative groundwork for Darwin, who famously wrote "I always feel as if my books came half out of Lyell's brain . . . I have always thought that the great merit of the *Principles* was that it altered the whole tone of one's mind, and therefore that, when seeing a thing never seen by Lyell, one yet saw it partially through his eyes" (*Darwin's Letters* 83).²⁹ Along with their shared insistence on seizing imaginatively what could not immediately be proved inductively, the theories of Lyell and Darwin required both scientist and reader to bend their minds to a shifting perspective. To see the world through the eyes of Lyell as of Darwin, the observer must be willing, at one glance, to survey concrete and local data, abstract from the visible, and envision a global system from what is sometimes nearly featureless evidence.

From Lyell, Darwin inherited a point of view, a sense of the earth's immense antiquity, a theory of the constant shifting and repositioning of geological phenomena, and a willingness to seek answers for the seemingly inexplicable (sea shells on a mountain-top, for instance) through a careful consideration of the fixed parameters of natural law. Indeed, one might even suppose that in the five years aboard the *HMS Beagle*, during which time Darwin read and re-read the three volumes of Lyell's *Principles*, Lyell's own convincing insistence on the immutability of natural law worked on Darwin's mind to ultimately number amongst the strongest arguments for the

inclusion of the human in the category “nature,” a separation Lyell was at pains to maintain. For it is Darwin’s inclusion of the human as an animal in the realm of nature that most starkly distinguishes his thinking from Lyell’s. And while, in Chapter IX, Lyell does briefly attempt an argument against burgeoning theories of species transmutation, his marked concern is plainly to lay the rhetorical groundwork for a subsequent declaration of the developmental fixity (at the biological level) and separateness of the human, who, in Lyell’s vision, stands unassailable as the earth’s crust shifts and sighs around it.

Darwin’s inclusion of the human in the category “nature,” rather than positioning him at odds with Lyell rather realizes the next step of Lyell’s own vision of the world; building a bridge out into a darkness which the geologist could not bring himself to confront. For Lyell’s very struggles with issues of perspective demonstrate an abiding preoccupation with the question of the human’s place in the natural world. And his own argument for uniformity in natural law – the theory that it is reasonable to assume that geological processes acting in the past are in keeping with the forces we observe at present (erosion by wind and water, sedimentation, volcanic eruption and the deposition of ash, and strata-shifting earthquakes, to name a few) – sets his exclusion of the human from this vision of a unified nature into stark relief. The artificiality of Lyell’s plan for the human is obvious to a modern reader, but to many of his contemporaries, his assertion that “the animal nature of man, even considered apart from the intellectual, is of higher dignity than that of any other species” and that the absence of fossilized or archaeological evidence to the contrary served to justify the assumption that “man is, comparatively speaking, of modern origin” (a product of God’s intervention into the otherwise uniform

plan of natural law), simply reiterated what readers already knew (I 155). “We may easily conceive,” he writes, “that there was a considerable departure from the succession of phenomena previously exhibited in the organic world, when so new and extraordinary a circumstance arose, as the union, for the first time, of moral and intellectual faculties capable of indefinite improvement, with the animal nature” (I 156). This homily to the superiority of the human intellect and exaltation of its uncappable potential for enlightenment is followed in short order by a meditation on the perspectival advantage afforded man by this clear divide between himself – a subject of the social, and moral order – and the rest of the organic and inorganic world – subject to the natural order.

VI.

Nearly thirty years after Lyell’s 1833 publication of the third volume of the *Principles*, Darwin’s *Origin* intervened to explode the comforting narrative of the man/nature or moral/material dichotomy that had enabled Lyell to cope with the perspectival vertigo associated with his vision of the slow, impersonal changes which shape the natural world. Darwin’s narrative struggles with the limits of perspective will be addressed in the next chapter, but for now we will be satisfied to simply state that his uniformitarianism included the human. The implications of this inclusion are best stated by Gillian Beer, who writes that according to Darwin’s vision of natural selection, we must understand that:

The individual organism does not evolve in the course of its life. Though it takes part in the evolutionary process, it does so only through generation,

not through any happening within its own life cycle. The individual is thus both vehicle and dead end. This Darwinian insight may not yet have been fully articulate for many Victorians (and indeed it has remained one of the least institutionalized of Darwin's ideas). But they clearly felt a new and urgent poignancy in the particular. (*Plots* 38)

That evolution cannot be observed within the span of the individual life, and that the individual cannot observe evolution are indeed underrecognized problems, but they are not within the scope of the present chapter. Chapter Two will seek to address these questions more fully. For now we may say that while Beer is surely correct in assuming that the disenfranchising of the human by Darwin's theory of natural selection was not fully articulate to many Victorians, yet it could be seen as the engine driving the central concerns of realist fiction. Preoccupied with origins, with human development, with cause and effect, with inheritance, lineage, progress, and retrogression, and with observing the localized interaction of multitudinous forces of change, novels like Eliot's *Daniel Deronda* and *Middlemarch*, and Hardy's *Jude the Obscure* and *Tess of the D'Urbervilles*, act out at least a sidelong confrontation with Darwin's excision of the human's agency in biological matters of development. These novels' insistence on the observation of the human as a specimen is a truly Darwinian phenomenon, but their preoccupation with mapping generational inheritance, with the evolution of character and society, and their frequent reliance upon a narrator-scientist – objective, removed, all-knowing – is much more Lyellian in its assumptions about perspectival distance.

As it did in the introduction to this chapter, George Eliot's *Middlemarch* will figure in the conclusion. Like the other works mentioned, *Middlemarch* has received

much critical attention as a post-Darwinian novel – one formed out of a new concern with minutiae, development, and the entanglement of organisms in a Darwinian web of affinities. But Eliot’s novel has not been measured against a Lyellian worldview – a critical lacuna most likely resulting from a dismissal of Lyell on the grounds of his antiquated views on transmutation and the human’s special status. Yet a combined reading, which shall be offered here, of the character of Eliot’s narrator in *Middlemarch* with the pivotal scene of Dorothea’s figurative awakening in Rome, reveals a hybridized Lyellian-Darwinian point of view.

Questions of point of view and angle of observation are continually in play in *Middlemarch*. Several chapters of the novel are framed by reminders of the contingency of point of view. Targeting the egotistic outlook of Rosamund Pike, Chapter 27 begins with the narrator meditating on optical selectivity, or the way in which an ego-driven outlook organizes the world observed into event-patterns emerging outward from the all-important self. A pier glass “minutely and multitudinously scratched in all directions” will reveal “a fine series of concentric circles” when observed with the help of a directed light source. A candle reflected on such a surface produces “the flattering illusion of a concentric arrangement, its light falling with an exclusive optical selection” (264). Whereas this chapter isolates Rosamund’s egoism in conceiving of herself as the “center of illumination” organizing patterns of life and activity in Middlemarch, Chapter 29 sees the narrator scrutinizing her own perspectival tendencies.

Beginning “One morning, some weeks after her arrival at Lowick, Dorothea – but why always Dorothea?,” the narrator pauses to reflect on her own surveilling eye. “Was her point of view the only possible one with regard to this marriage?” she asks (278). To

the first question, there are many answers, but to the second, the very form of the narrative allows us to respond with a resounding No: Dorothea's point of view is not the only one. While the larger conflicts at work in the novel (local revulsion at the expansion of the railroad, and the 1832 Reform Act, with its extension of the franchise and revision of the electoral system in England and Wales) find microcosmic expression in Dorothea's private struggles (caught as she is between the anachronistic Casaubon and the progressive Will Ladislaw), she is not alone in locally reproducing the text's global concerns. And while, as Rosemary Ashton writes in her introduction to *Middlemarch*, "It is characteristic of George Eliot to vary the point of view in this way; it is her chosen method of enlarging our sympathies while amply fulfilling our need for an interesting plot, believable characters, and a pleasing pattern and structure" (xx), this response to Eliot's self-consciously roving narrative eye is insufficient.

From the damning parable of the pier glass, to the self-censoring reprove "But why always Dorothea?," to the comparison, at the beginning of Chapter 41, of the narrator's watchful eye to the archangel Uriel, "watching the progress of planetary history," Eliot's narrator, whose stated interest is in "unravelling certain human lots, and seeing how they were woven and interwoven," continually reminds the reader of the scrupulous care she takes to remain disinterested in her observations of life in *Middlemarch* (412, 141). It is in this sense that Eliot's narrator can be compared to Lyell, for they share an assumption about an observer's ability to stand apart from the thing observed. Like Lyell, Eliot's narrator provides a unifying viewpoint; she restores in imagination the scenes of the past, the "unhistoric acts" and "hidden life" that leave no clear mark on the world (838). In turning her eye upon Dorothea, whose "incalculably

diffusive” effect on the world around her was, we are told, “not widely visible,” the narrator’s tale offers a fictional accounting of gaps in history which reproduces the parameters of Lyellian and Darwinian thought-experiments (838). But while the narrator demonstrates many Darwinian concerns – in seeing her world as a web of affinities, and in focussing on the minute and multivalent developments that produce change in Middlemarch – hers is a Lyellian gaze.

For the narrator’s uniformitarian vision of life in Middlemarch is defined by her detached and impregnable vantage point. The reader is encouraged to understand that it is by virtue of her distance from the fray of life in Middlemarch that the narrator is able to witness it in all its complexity. Removed from the action by a forty-year lapse in time (from the 1831 election to the 1870 composition of the novel), and by virtue of her commitment to a globalized perspective, the narrator overcomes the perspectival limits that are seen to constrain so many of the characters. Comprehending plurality into her vision, the narrator offers a moving picture of the erosions, displacements, and repositionings that make up life in a small town as forces of change act upon it.

Unlike their narrator, whose vision works like the strong-lensed microscope of Chapter 6, revealing the “tiniest hairlets” of cause and effect, the characters of Eliot’s novel are thoroughly entangled in the web of affinities that joins them together, and generally blind to the forces which guide their thoughts and actions (60). Compared to the cool, purposeful tone of the narrator’s account, the story’s characters seem to grope their way through life with little to no perspective on their own movements. Dorothea, whose “short-sighted eyes” allow her only “a very blurred shortsighted knowledge” and little “outward vision,” is led by her myopic idealism to wed the scholar Casaubon,

whose own deafness to recent work by German historians prevents him from realizing the futility of his search for a comprehensive explanatory framework for all mythology.³⁰ Lydgate misapplies his intelligence in his search for the primitive tissue, putting the question (“What was the primitive tissue?”) “not quite in the way required by the awaiting answer” (148). Mr. Brooke’s haphazard and fragmented thought- and speech-process (his “rambling habit of mind”) makes him incapable of knowing his own mind, much less making himself understood by others (as we see in Chapter 51 with his meandering and ultimately abortive speech at the electoral debate) (8, 503).

In a novel steeped in Darwinian metaphors (the recurring motif of the web, the attention to minutiae and development, the protracted issue of inheritance relating to Mr. Featherstone, Casaubon, and Will Ladislaw, and even the sidelong meditation on extinction via Celia’s nickname for Dorothea, whom she calls “Dodo”), and replete with characters for whom the future is utterly unforeseeable,³¹ we find a narrator who holds within her grasp a map of their development. Beer writes that in Darwin’s vision, “the future is an uncontrollable welter of possibilities” (*Plots* xviii). In *Middlemarch* we find the curious convergence of a Darwinian world with a Lyellian observer, one who retains her coherence even while beholding the dizzying fray of life.

Whereas Darwin includes the human in the scope of his vision of evolution and natural selection (only very fleetingly suggesting a divide between an objective scientific gaze and observable nature), Lyell’s point of view, like Uriel’s, is disentangled from the mess of natural flux – his is the “immeasurably patient eye” (*Plots* 169). Combining a Darwinian material realm with a Lyellian observational vantage, Eliot’s novel offers a third point of view. Since Darwin’s theory of evolution and natural selection had

suggested that evolutionary development escaped observation, and Lyell before him had emphasized the achingly slow process of geological formation, Eliot turns a Darwinian-Lyellian hybrid gaze upon the accretions and erosions of the social organism. And although her portrait of pastoral life in Middlemarch broadly enables her to stage her inquiry into a cross-section of English society, it is in her description of Dorothea's breakdown in Rome that we find the most compelling example of Eliot's combination of Darwin's principle of intertwined flux in nature with Lyell's vision of an immense stratified past. In Eliot's novel Rome stands in for one of Lyell's theatres of reproduction, and Dorothea, who lacks a Lyellian autonomy from the world observed, suffers the consequences of beholding at one glance the "stupendous fragmentariness" of "the city of visible history" (192). Through Dorothea, Eliot expresses a response to both the idea of perspectival limitation and expanded vision consequent of developments in natural science.

Eliot writes:

[Dorothea] was beholding Rome, the city of visible history, where the past of a whole hemisphere seems moving in funeral procession with strange ancestral images and trophies gathered from afar. . . . But this stupendous fragmentariness heightened the dreamlike strangeness of her bridal life. . . . To those who have looked at Rome with the quickening power of a knowledge which breathes a growing soul into all historic shapes, and traces out the suppressed transitions which unite all contrasts. . . . The weight of unintelligible Rome might lie easily on bright nymphs. . . . but Dorothea had no such defence against deep impressions. . . . Titanic life

gazing and struggling on walls and ceilings; the long vistas of white forms whose marble eyes seemed to hold the monotonous light of an alien world.

(192-3)

Beholding monuments of disparate histories in contact with one another, and lacking the tools to flesh out the “suppressed transitions,” Dorothea is overcome by her brief insight into the “incongruities” of history, religion, and civilization (194). Casting her private beliefs and expectations into stark relief, this theatre of roiling life allows Dorothea a moment of witnessing in which she catches a glimpse of the utter insignificance of the single life and its aspirations. Rome exists in Dorothea’s vision as both a site of stratified history, where layer upon layer of the detritus of civilizations reinforces the walls and ceilings of the present era, and of the tangled web of all the accretions and erosions resulting from centuries of religious conflict whose traces are readily seen in the twining iconographies of paganism and Catholicism. To her puritan’s eye, the “red drapery which was being hung for Christmas” seems to spread “itself everywhere like a disease of the retina” (194).

To Dorothea the incongruities of Rome are ultimately irresolvable. Though she beholds at one glance a great theatre of reproduction and decay and gains brief insight into the smallness of her concerns in comparison to the Titanic life which Rome makes visible, Dorothea cannot disentangle herself from the accretions and erosions of existence. And while she gains brief access to a Lyellian perspective, she remains rooted in a Darwinian world. This, Eliot writes, is the human condition, for

If we had a keen vision and feeling of all ordinary human life, it would be like hearing the grass grow and the squirrel’s heart beat, and we would die

of that roar which lies on the other side of silence. As it is, the quickest of us walk about well wadded with stupidity. (194)

For a moment Dorothea and Rome converge: in beholding its “stupendous fragmentariness” she becomes aware of her own state of flux, as her ideals and beliefs – her hopes for her marriage and her religious convictions – are jostled by a sudden awakening to the reality of her life. But Eliot only allows Dorothea a glimpse of the simultaneous accretions and erosions of all life, for she knows that “that roar which lies on the other side of silence” is also always passing through ourselves, and to be attuned to it would be like beholding diffusely. And although Eliot allows Dorothea to momentarily realize Darwin’s fantasy of contemplation, with Rome standing in for the entangled bank, she seems to have Darwin’s voice in the background, cautioning, “How fleeting are the wishes and efforts of man! how short his time! and consequently how poor will his products be, compared with those accumulated by nature during whole geological periods” (*Origin* 133).

VII.

Though fiction enables the exploration of the limits of perspective, and although through it Eliot is able to combine a Lyellian insistence on the human’s capacity for insight with a Darwinian vision of the web of affinities, her allegiance in *Middlemarch* is ultimately to realism. And while her narrator remains detached and witness to panoramic life, as Lyell does in the *Principles*, her characters have feet of clay, and in their stories they are bound to the material realm imagined by Darwin in the *Origin*. Nevertheless, in

Middlemarch Eliot is able to offer sympathetic reflective notice to the problems to which science can only obliquely gesture. That the individual life “takes part in the evolutionary process . . . only through generation, [and] not through any happening within its own cycle” (*Plots* 38) is a key insight for those who, like Eliot, struggle to find a language to think in after Darwin. The idea that the individual is both “vehicle and dead end” in the scope of evolution is precisely the kind of thought that inspires the narrativization of a Dorothea. Celebrating her “hidden life” and the “incalculably diffusive” effect of her being, Eliot’s novel ends with a Lyellian-Darwinian affirmation of the individual’s role in the great process of gradual change: “For the growing good of the world,” she writes, “is partly dependent on unhistoric acts; and that things are not so ill with you and me as they might have been, is half owing to the number who lived faithfully a hidden life, and rest in unvisited tombs” (838).³² Eliot’s text wrenches the processes of change described by Lyell and Darwin out of the dizzying immensity of a deep past from whose story the human is largely absent and sets those processes in the present – in human and social terms. The forgotten “number” of Eliot’s story stand in for the gaps in the fossil record in Lyell and Darwin’s texts. And though Eliot’s timeline for change accelerates geological and biological modification, the fictionalizations of natural processes of change explored by Eliot have their precedent in the very texts that breathed life into the idea which she nurtures in *Middlemarch*.

As Beer writes, Victorians “were made aware . . . of the vigorous life that long preceded human memory. Their fascination with history is one response to that awareness—as well as an intensifying symptom. But history was preoccupied with power, and what evolutionary theory brought out in contrast was the thronging

powerlessness of the individual organisms who were the medium of change” (“Oblivion” 69). From the point of view of history and the developments of evolutionary science that shortly followed, Lyell’s championing of the power of the individual perspective could look like the final death throes of an antiquated dogma at odds with the radicalizing scientific concept forwarded in the *Principles* in general. But that we find traces of Lyell in Eliot’s text demonstrates the abiding concern with carving out a space for the human voice to sound in the huge impersonal movements of time. Faced with a process of flux in nature which includes the human, Eliot applies the language of development, accretion, and erosion to an abbreviated span of time. Whereas, as Beer writes, Lyell “stretched time backward an unknown and irrecoverable extent” (*Plots* 70), and Darwin made the individual lifespan appear insignificant in the face of evolutionary change, Eliot turns her attention to “unravelling certain human lots, and seeing how they were woven and interwoven” in a plea to bring the terms of geological and biological change to bear on human history (Eliot 141).

That the “visible history” of Rome should have caused Dorothea’s world to slip and that its stratifications should have allowed Eliot the space to consider the effect of a geo-biological perspective, is very fitting, for Lyell’s own text opens on a similar vista. The first volume of Lyell’s *Principles* is prefaced with a frontispiece (see Plate 1) which he simply titles “*Present state of the Temple of Serapis at Puzzuoli.*” In the picture, three columns, nearly all that remains of an ancient Roman temple, reach upward from just above the surface of a placid body of water. Around the pillars are a few remnants of the ancient temple – fragments of a wall and perhaps of a great staircase – the smoothed edges of which show the effects of the erosive force of water. And each of the three

columns shows signs of having spent a good deal of time underwater. As Martin Rudwick writes, “After Roman times the site had evidently sunk below sea level, where the columns had been bored by marine organisms, but it had been re-elevated nearly to the original level during an earthquake in 1538” (“Strategies” 5). Rudwick goes on to say that Lyell’s frontispiece “epitomizes perfectly his argument that ceaseless *nondirectional* fluctuations of physical geography have been going on even in historic times” (15). As Rome provides Eliot with the perfect cross-section of the history of civilization, the Temple of Serapis offers Lyell a means of immediately housing his exploration of the earth’s deep past within the comforting narrative of human history. The Temple of Serapis belongs to a conceivable past; its great antiquity lends it an aura of permanence; yet it bears the scars of subsidence and upheaval. With this image, Lyell stages a primary concern of his work – a concern crucially bequeathed to Eliot and other novelists of uniformitarian realism who followed him: to find a way to include human memory and history in an exploration of the huge impersonal movements of the earth.

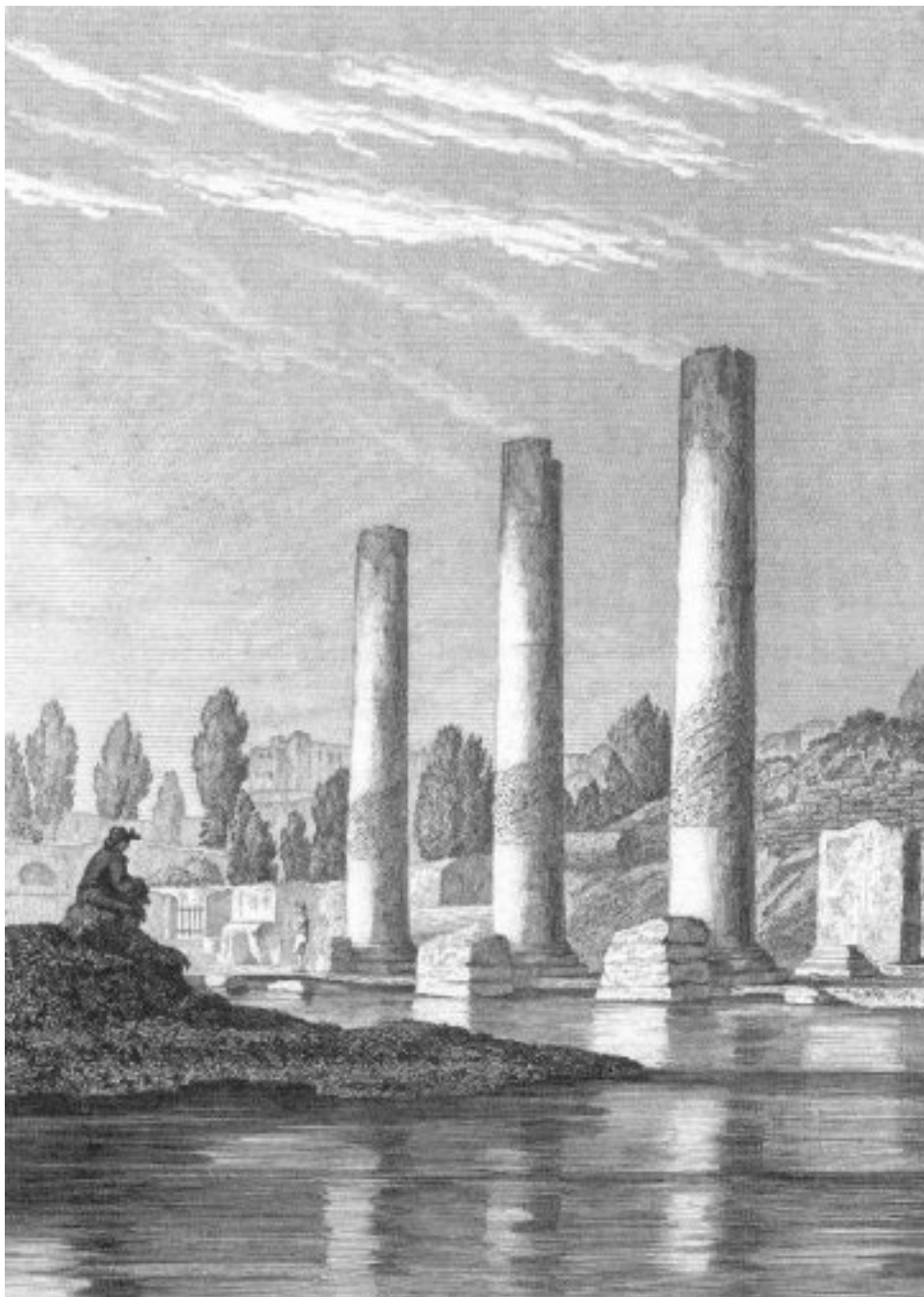


Plate 1. "Temple of Serapis at Pozzuoli near Naples"³³

Notes

¹ See George Levine *Darwin and the Novelists*, pages 2-10, in which he establishes his argument that science is a cultural product whose concerns emerge from the cultural matrix at least as much as do those of literary productions.

² Eliot borrows the archangel Uriel from Milton's *Paradise Lost*, III, 648-53.

³ Here I appropriate Darwin's famous phrase, "the inextricable web of affinities," which has been developed by Gillian Beer and others in relation to Eliot's use of the metaphor of the web. See *Middlemarch*, pages 141, 617, and 832.

⁴ Eliot signals the forty-year gap on several occasions, but the example from Chapter 19, on page 188, is very direct. She writes, "In those days the world in general was more ignorant of good and evil by forty years than it is at present."

⁵ All citations from Lyell's *Principles of Geology* are from Volume 1.

⁶ Writing for the *Oxford Dictionary of National Biography*, Richard Yeo notes: "In reviewing, at Lyell's request, the second volume of *Principles of Geology* for the *Quarterly Review* in March 1832, Whewell coined 'Uniformitarian' and 'Catastrophist'—terms that were adopted as labels for the opposing doctrines in the geological debates of the day".

⁷ Here I anticipate my discussion in Chapter Three of Freud's statement: "we have been obliged to build our way out into the dark" (*IOD* 588).

⁸ I take "Whiggish" as shorthand for a style of historicization that sees the historical narrative as one of progress toward enlightenment. Lyell's text admits to this approach in a number of instances. For example: "we must admit that the gradual progress of opinion

concerning the succession of phenomena in remote eras, resembles in a singular manner that which accompanies the growing intelligence of every people, in regard to the economy of nature in modern times” (*Principles* 26).

⁹ See Armstrong, *Victorian Poetry*, where she describes the world that Lyell envisions as one “continually in a state of repositioning, a shifting condition of mobility in which areas literally ‘move about’” (262).

¹⁰ See Cannon, “The Bases of Darwin’s Achievement: A Reevaluation.”

¹¹ The radical empiricism that Lyell develops incorporates Plato’s concept of anamnesis, which emerges from his anti-empirical philosophy in *Phaedo*. In section 66 (a) of *Phaedo*, Plato writes (in the voice of Socrates): “the man who pursues the truth by applying his pure and unadulterated thought to the pure and unadulterated object, cutting himself off as much as possible from his eyes and ears and virtually all the rest of his body, as an impediment which, if present, prevents the soul from attaining to the truth and clear thinking? Is not this the person, Simmias, who will reach the goal of reality, if anybody can?” (127). Later, in section 86 (a) and (b), Plato writes, in the voice of Simmias, and through the analogy of tuning the strings of a musical instrument, that “the attunement is something invisible and incorporeal and splendid and divine, and located in the tuned instrument, while the instrument itself and its strings are material and corporeal and composite and earthly and closely related to what is mortal” (157). In this passage, Simmias develops Plato’s concept of anamnesis, that all knowledge is remembrance. Later in this section Socrates envisions himself as a midwife to knowledge, aiding the

emergence of what is already there. Lyell's work in Chapter V is to build a bridge between a Platonic idea of the sources for knowledge and an empirical doctrine.

¹² This phrase appears in Darwin's letters, as well as several chapters of *On the Origin of Species*. For a full searchable catalogue of the recurrence of this phrase, see <http://darwin-online.org.uk>.

¹³ See Trevor H. Levere. *Poetry Realized in Nature: Samuel Taylor Coleridge and Early Nineteenth-Century Science*. London: Cambridge UP, 1981. 170-72. Print.

¹⁴ Although Lyell brings his inductivist approach to the Bible's diluvial account, which he forcefully invalidates, he resists applying it to the question of beginnings, preferring instead to cite God as the un-interfering author of natural law who, aside from the latterly addition of humankind in the comparatively recent history of the earth, does not engage in its processes. See especially Chapter IX of Volume I of the *Principles*.

¹⁵ As Jonathan Smith notes, "for Coleridge, uniformitarianism, as a theory built up exclusively from "facts" without the mental initiative of mind was necessarily incomplete" (99-100). Smith then turns to *Specimens*, where Coleridge is cited as saying, "Mr. Lyell's system of geology is just half the truth, and no more. He affirms a great deal which is true; and he denies a great deal which is equally true" (199).

¹⁶ For a detailed analysis Coleridge's concept of the relation between the individual and the past see Kooy, "Romanticism and Coleridge's Idea of History."

¹⁷ The embedded reference to William Blake's poem, "The Mental Traveller" is felicitous here. Blake's traveller traverses "a Land of Men" and gains insight into "dreadful things / As cold Earth wanderers never knew" (1-2). Blake's mental traveller does not coincide in

any simple sense with either Lyell's restorer or Coleridge's philosopher, but perhaps the poem's motifs of creation, catastrophic life, continuity, building or growing, and attendant crumbling or degeneration, can be allowed to stand as generative echoes in this reading of the geological imagination.

¹⁸ See Smith (92-120). Though I came to his text late, and though Smith's study is directed at Lyell's particular interpretation of Baconian empiricism, his use of the phrase "geological imagination," to denote an imagino-empirical technique that Lyell bequeaths to Darwin, is arresting and relevant to this discussion.

¹⁹ Krasner draws attention to one part of this passage, and I make occasional use of his insights into Lyell's methodology, but I must draw the reader's attention to an important error made by Krasner in his reading of this element of Lyell's text. In his citation of the Rhone valley passage, Krasner spuriously collapses two very separate passages from Lyell without acknowledging that the first part (which I quote in full) is taken from Volume 3, while the second part ("But secondly, all these causes of fluctuation in the sedimentary areas are entirely subordinate to those great upward or downward movements of land, which will presently be spoken of, as prevailing over large tracts of the globe") is taken from Volume 1. In collapsing these two passages, and in ending with Lyell's uncharacteristically lighthearted "great upward or downward movements of land," Krasner misleads the reader by lending Lyell's text a sensational tone which does not belong to it.

²⁰ For example, Lyell distinguishes events of the deep geological past from “events which have happened since the time of history” (*Principles* I 177). One beginning point of this historical period might be the Mesopotamean codification of law around 3000 BC.

²¹ Owen Anderson makes the point that “the principle of uniformity is itself not empirical but instead seems to rely on a Humean epistemology” (462).

²² See Chapter 4, “1818-1823 Oxford and After,” of Sir Edward Bailey’s *Charles Lyell*.

²³ My edition of Lyell’s *Principles* has “a sudden change” where Krasner quotes “suddenly altered.”

²⁴ There is of course room in Lyell’s theory of uniformitarianism for a shift in the speed of sedimentation if the consequence of the lake filling up resulted in putting more pressure on the current, and speeding up the process of the transportation of matter southward to the Mediterranean.

²⁵ As I have suggested above in endnote 23, Krasner’s collapsing of two different passages from Lyell’s long treatise has the unfortunate effect of velocifying Lyell’s already-notable narrative acceleration.

²⁶ It is in Volume 2 of *Time and Narrative* that Ricoeur offers his definition of mimesis and his elaboration of emplotment.

²⁷ For while Hume acknowledges the necessary fictions of the imagination (Mary Warnock writes that for Hume “There would be no world to be understood without a prior imaginative construction”), it is the action of the faculty of reason, and not of the imagination, which leads the scientist to empirical induction and the development of laws about cause and effect (42).

²⁸ The citation is from Virgil, *Georgics*, Bk 4, lines 34-6. This translation from the original Latin by Dryden is taken from Secord's edition of the *Principles* (102). The passage is untranslated in Lyell's text and reads: "— ire per omnes / Terrasque tractusque maris, coelumque profundum" (I 166).

²⁹ Letter to L. Horner, August 29th, 1844.

³⁰ Eliot 472, 765, 774, 208. Ladislav berates Casaubon, saying "the Germans have taken the lead in historical inquiries [...]When I was with Mr Casaubon I saw that he deafened himself in that direction: it was almost against his will that he read a Latin treatise written by a German."

³¹ Will Ladislav stands alone as a character with a firm grasp on his moment in history, and perhaps some sense of what is to come.

³² Gillian Beer unconsciously makes this point in "Origin and Oblivion" by adding the implied "forgotten" in the phrase "owing to the number," thus underscoring the indifference of the great gulf of the past to the domestic events of its incalculably immense number of individuals. I have searched the 1965 Penguin edition cited by Beer, and have not found "forgotten." Perhaps Beer reinvents the passage in a Dorothean impulse to attend to the forgotten multitudes.

³³ See frontispiece of *Principles of Geology*, Vol. I. Ed. Martin Rudwick.

CHAPTER TWO

OBJECTIVITY, IMAGINATION, AND NARRATIVE IN *ON THE ORIGIN OF SPECIES*

How fleeting are the wishes and efforts of man!
 how short his time! and consequently how poor will
 his products be, compared with those accumulated
 by nature during whole geological periods.

C. Darwin (*Origin* 133)

I.

The previous chapter considered some of the narrative strategies employed by Charles Lyell to cope with the destabilizing consequences of both thinking and explaining deep time and ongoing geological change. For Lyell the huge impersonal movements of geological time are comprehensible only when the human (and by extension humankind) stands apart from the fray and is subject to discrete natural laws. Whether thinking this way allowed Lyell to conceive of the immensity of geological time, or whether the immensity of geological time forced Lyell's mind to garrison itself against the dizzying and demeaning effects of realizing the minuteness of the human's role in the theatre of material flux, the result is the same: in the *Principles of Geology* Lyell excludes the human from the nature he observes in order to construct a coherent perspective for himself as empirical observer. Lyell achieves a placid tone in the *Principles* by distinguishing between the creative forces of nature and of the mind.

Separate from the indifferent action of natural law upon the material world, the moral observer, with sole tenure of the faculties of reason and imagination, is free to overcome both the distressing nondirectionality of change in the geological world and the immensity of deep time – to build a stable, sequential narrative embrace for an incoherent subject. In Lyell’s treatise on geology the imagination is an almost heroic force, capable in its plasticity of surpassing the limits of perception and of transcending gaps in knowledge.

In this chapter I turn to Charles Darwin, who not only read and admired Lyell’s work but continued it, urging it in the very direction Lyell was so deeply reluctant to explore by including the human in the appalling turbulence of nature. Compared to Lyell’s, Darwin’s text at first seems austere, even dry – one long argument explored from all angles. Lyell’s text is not only full of narrative digressions – from counterhistorical fictions, to anthropomorphic fantasies, to debunking sketches of diluvial theories – but is ultimately structured around the narrative concept of uniformitarianism. This theory of the constant, unvarying, and uniformly operating forces of nature not only lends coherence to the billions of years of slow, largely imperceptible change undergone by the earth’s crust, but also, as an explanatory model, functions to contract an immensity of time, fitting it within the confines of sentences. In Lyell’s text, this comfortable sense of sequentiality is bolstered by the double distancing effect first of the narrative model for nondirectional change and then by the protective cocoon inhabited by the narrator/human. Darwin’s text offers no such panacea. From the first page, the reader is thrust into a disorderly world of modification, variation, transformation. This is a world where “species, including man, are descended from other species,” where organic and inorganic

matter are governed by the same natural laws, and where the physical conditions of life can lead to modifications and adaptations in living organisms (*Origin* 54).

In *The Principles of Geology* Lyell's anaplastic imagination is a supreme force with the power to restore to consciousness events of the deep past, to organize undifferentiated occurrences into a sequence, and to partition itself from the instability all around it. In Darwin's *On the Origin of Species*, however, the only supreme force is natural law, and it does not differentiate between the patient observer and the object of his curiosity. So while Darwin inherits Lyell's vision of geological time as an immense, slow, observable present, the fact that the observing eye he turns upon palpitating nature must hold itself in its own sights leads him to produce in the *Origin* a text that registers a great discomfort. In what follows, I shall suggest that Darwin's drive to produce in the *Origin* an account of speciation that transcends its author's ego sees him struggling to displace the affective "I" from his observing eye, but that his reliance on narrative structures frequently reinstates his own privileged subjectivity. For as I have argued in relation to Lyell, in the face of immeasurably slow processes of upheaval and subsidence, narrative is the human's reconstruction of events into a comprehensible pattern (for Lyell this pattern is uniformitarianism). Narrative translates *occurrences* into *events* and *events* into *sequences* in the imposition of the imagination upon the natural world. And whereas Lyell's text fearlessly clears a space for his own voice to interject, for the literary imagination to weave fantasies, and for a narrativization of time to make the deep past less threatening, Darwin's text – and here I refer specifically to the *Origin* – anxiously registers each of these possible approaches but only appears to overcome them through the privileging of an objective epistemological model. In the *Origin* Darwin mitigates his

first person interchange with the reader, evinces a strong suspicion of the imaginative faculty, and is at pains to keep constantly in his own mind and the reader's mind the disturbing thought of the immense and slow forces at work within and all around – but, as I will explore, in several key moments Darwin's text also registers a refusal to comply with the mandates of objective science. The *Origin* is very much a descendent of the *Principles*, inheriting a Lyellian view of geological upheaval and subsidence, along with an empiricism marked by the unverifiability of the “observed” phenomena and bolstered by thought experiments, but the necessity for Darwin to turn his observing eye upon himself, dwelling in the field he observes, makes for a very uneasy account.¹

II.

In emancipating himself from nature and natural law Lyell does much to convey to his reader an image of himself as the disinterested, scrutinizing scientific mind. Indeed, Lyell operates in the *Principles* as a kind of omnipresent, preternaturally flexible, and, crucially, disembodied mind (unfettered by the constraints of space and time). And the Baconian scientific method that both Lyell and Darwin aspire to, characterized by systematic observation, experimentation, and the formulation of verifiable, and falsifiable hypotheses, “unconstrained by the winds of interest or subjectivity,” all but mandates the imperative to *construct* oneself as unbiased in the conveyance of new facts in the economy of nature (Levine *Darwin* 5).² But, perversely, in empirical science the observing, experiencing subject is forever threatening to cast a shadow upon the observed phenomena, and so the very idea of objectivity in the empirical scientific investigation is

always fraught.³ In their study of objectivity, Lorraine Daston and Peter Galison point out that in his *Critique of Pure Reason*, Immanuel Kant (at the vanguard of philosophical discussions of the objectivity of the scientific mind and an important inciting force for the development of a clear distinction between objectivity and subjectivity) frequently synonymizes empiricism with subjectivity, modifying each with a sneering “mere [*bloß*]” (262).⁴ Daston and Galison note that in the middle decades of the nineteenth century,

empiricism in the service of scientific objectivity, in contrast to older ideals of truth, demanded that the variability of observed phenomena be carefully heeded, rather than abstracted from or idealized. [The value of representative drawings of the natural world] lay in the scrupulous rendering of each specimen in all its individual particularity, rather than as a composite of several individuals or as an idealized type (262).⁵

Self-denial, and resistance of the tendency to unify similar perceptions into a single, synthesized, mental image, but rather to catalogue even the minutest differences between, say, two specimens of the same species, are fundamental practices, first in the development of objectivity of mind, and second, in the production of empirical knowledge and fact. In the previous chapter, I explored Lyell’s techniques for insight into the operation of uniformitarianism’s slow, impersonal change, and the relationship of his visionary imagination to the narrativization of his actualist theory of subsidence and upheaval. Lyell’s text was produced in the years leading up to the widespread vogue of objectivity in science, and we have examined the extent to which Lyell is less anxious about the incursions of his own subjectivity in the narrativization of his scientific theory. For Lyell, the human subject is so utterly divided from the nature he observes that his

presence in the narration of natural phenomena does not constitute a threat to the accuracy of the scientific communication. By the time Darwin wrote the *Origin*, epistemological preferences within the scientific community in England and elsewhere had shifted considerably, and the language of objectivity had become much more widespread. As Galison writes, “in the nineteenth century—or, more specifically, after about 1830—. . . the desired character of the natural philosopher inverted to one of self-abnegation,” becoming “more saint-like in self-denial than powerful in genial interpretation” (“Judgment” 329). And we can observe elements of this epistemological shift as we move from Lyell’s work to Darwin’s.

Though Darwin does not directly reflect on this subject, traces of the new epistemic virtue of objectivity are far more in evidence in the *Origin* than they are in the *Principles*. A search through the *Darwin Online*⁶ version of Darwin’s *On the Origin of Species* reveals that in the 406 pages of his 1859 edition, the word “fact” appears 297 times, or in other words, “fact” appears on 73% of pages.⁷ Relatedly, the same search of Lyell’s *Principles* (volumes I through III) reveals that in 430 pages of text, the word “fact” appears only 104 times, or on 24% of pages. Of course, the mere presence of the word “fact” is insufficient grounds for a claim that Darwin is speaking to the new epistemic virtue of objectivity (scientific discourse includes the concept of fact from its inception). But a search like this one draws attention to the instances in which Darwin brandishes evidence of his patient industry, his plodding collection of details and observations, which, in their numbers, justify his scientific claims. Of the 297 instances of the word “fact” in the *Origin*, 23 occur within a reference to the author’s collection of a large catalogue of facts. In his 1890 text *L’avenir de la science: pensées de 1848*, the

historian and philosopher Ernest Renan offers a description of objectivity of mind in science which targets the importance not only of the collation of facts but of the foregrounding of such catalogues in scientific texts. He writes:

Monographs on every aspect of science, this should be the great work of the nineteenth century: difficult, humble, laborious works, demanding total and disinterested devotion; but solid, durable, and, moreover, founded upon the importance of the realization of the goal. . . . One must have profound scientific virtue to pause on the slippery slope and deny oneself momentum, when human nature urges us to draw conclusions. The heroes of science will be those who, though capable of the highest philosophical thought, deny themselves any assumptions, and resign themselves to be humble cataloguers, even when all the instincts in their nature urge them to let their mind fly to the highest summits. . . . [One must] abandon the soul to save it. *One must be resolved to ignore in order that the future might know. . . .* And so! monographs are, after all, what endure the longest. A book of generalities is naturally surpassed after ten years, but a monograph made up of scientific facts – a stone in the edifice of knowledge – is in a sense eternal in its results. The author's name may be forgotten; the text itself might fall into oblivion, but the conclusions it helps to establish endure (234-6; translation mine).⁸

The complex intertwining of an almost beatific humility with an heroically disinterested devotion to the work of uncovering the facts of nature – this is the task facing the truly objective scientist. Though not all advocates of objectivity called for such an extreme

purging of the self – some, like T.H. Huxley cleared a space in their thought for the special ability of the individual *to submit* to being a vehicle for the transmission of truths about nature⁹ – Renan’s focus on the restraint of the will lends his text a universality within the larger discourse of objectivity. And while Darwin could not have read Renan’s tract, the sentiments expressed in it are representative of the dominant mindset pervading the atmosphere in which Darwin wrote the *Origin*.¹⁰ From the natural theologian William Whewell, who lamented, “there is a mask of theory over the whole face of nature if it be *theory* to infer more than we see,” (46)¹¹ to the physicist John Tyndall, who insisted that “the first condition of success is patient industry, and honest receptivity, and a willingness to abandon all preconceived notions, however cherished, if they be found to contradict the truth,”¹² and who advocated “self renunciation,”¹³ to its roots in Descartes’ *cogito ergo sum* and the Cartesian self “defined by the purgation from it of everything that is contingent, temporal, social, inherited, human,” the doctrine of objectivity was everywhere in the air (Levine *Dying* 2, 4). Indeed, Darwin’s candour and modest tone are reflected upon by most critics who respond to his work. George Levine, for instance, writes that “It is perhaps the most distinguishing character trait of Darwin: humility that keeps him from imposing himself on nature and that ultimately allows him to become the major propagator of perhaps the most humbling doctrine in the history of Western thought” (*Dying* 26).¹²

In light of this discussion of objectivity the moment has come to return to our mathematical survey of the *Origin*, and the 297 instances of the word “fact.” That Darwin was aware of the trend in the scientific community to embrace the virtue of objectivity of mind can be taken as given. As I have argued, his text often signals – even in this rudest

sense, by his use of the word “fact” and his references to having assembled “long catalogue[s] of facts” – his awareness of the imperative of communicating the truths of nature unsullied by perspective. But what is truly arresting about Darwin’s text is that it is precisely in these moments which signal the epistemic virtue of objectivity that we find glimmers of self-assertion – of resistance. In other words, the moments in his text that most forcefully remind the reader of the doctrine of objectivity are also the moments in which Darwin sidesteps the mandate to favour the cataloguing of facts over the drawing of conclusions or the extrapolation of general laws from the evidence of experience. Out of 297 instantiations of the word “fact” at least 23 occur at moments in the text at which Darwin feels his argument necessitates that he *list* the facts that support his claims. At key moments in his discussions of variation under domestication, variation under nature, selection, natural selection, hybridism, geographical distribution, and descent, Darwin refuses to interrupt his narrative with the insertion of the many facts he has gathered that prove his argument.¹³ Instead, he repeatedly uses one or both parts of a recurring formula. One example, which shows both parts of this formula, occurs at the very outset of his chapter on variation under nature. He writes:

Before applying the principles arrived at in the last chapter to organic beings in a state of nature, we must briefly discuss whether these latter are subject to any variation. To treat this subject at all properly, *a long catalogue of dry facts should be given; but these I shall reserve for my future work* (101; italics mine).

Informing the reader that the correct treatment of the subject – variation under nature – requires that a list of facts be given, Darwin proceeds to withhold such a list. Throughout

the *Origin* Darwin apologizes for this act of withholding, maintaining that he is compelled to treat certain subjects “too briefly,” or stating that the present work does not allow for a detailed accounting of the facts collected by its author (67, 218).

The comparative speed with which Darwin wrote *On the Origin of Species* – relative to the 20-odd years he spent collecting data and formulating his theory of the variation of species by means of natural selection – has been much discussed. The drama of Darwin’s receipt of Alfred Russell Wallace’s essay “On the Tendency of Varieties to Depart Indefinitely from the Original Type” in June 1858, and the subsequent accelerated production of his “abstract,” the *Origin*, does not need to be rehearsed here.¹⁴ That Darwin was writing quickly is indisputable – *On the Origin of Species by Natural Selection, or, The preservation of favoured races in the struggle for life* was produced between August 1858 and October 1st, 1859 (a date signaled in his journal by the phrase “Finished proofs”) (Browne *Power* 81). But it does not necessarily follow that the need for brevity should result in the repeated exclusion of the large body of facts in his possession which proved the various elements of his theory. The writing-out of a catalogue of facts would seem to require less effort than the narrativization of the conclusions to which these facts have led. But time and again Darwin implies that the conditions surrounding the composition of his text necessitate that the lion’s share of his accumulated facts be excluded.

The other half of Darwin’s formula for withholding the long catalogue of facts takes the form of a promise. First, he apologizes (a long list of facts *should*, or, elsewhere, *could* be given), then he promises (“these I shall reserve for my future work”).¹⁵ But in every instance in which Darwin refers to a long catalogue of facts which

could be given, and to a future work which would, perhaps, be something of a Renanian monograph, no future work ever appears. Darwin did not produce monographs on variation under nature, the tendency of dominant species to vary most, the struggle for existence, or the natural checks inhibiting species' increase.¹⁶ The expectation that he should have produced these secondary texts might be unfair if Darwin had not, between 1860 and 1876, produced five subsequent editions of the *Origin*, all of which continued to employ this language of apology and promise, nearly always verbatim.¹⁷ By the 1876 edition of the *Origin*, Darwin was 67 years old, and in declining health, and the doubtfulness that he would go on to produce the promised works must have been clear to him. Yet he maintained the promise.

If, as George Levine argues in *Dying to Know*, the condition of objectivity is one of self-abnegation, then perhaps Darwin's abortive gestures to the mandates of objective science can be read as instances of his refusal to efface himself from the text. In these brief moments, Darwin surfaces and deploys his own authority, insisting on himself as the source of information, and insisting on his own narration of the facts which support his argument. In referring to the facts as "dry," Darwin demonstrates his commitment to interest his reader, for it would have been perfectly acceptable for him to present his readership with a monograph of such "dry" facts. Apart from wishing his audience to understand the conclusions *he* has drawn from the accumulated data, or, apart from wishing to prevent readers from drawing the *wrong* conclusions, Darwin also demonstrates his refusal to undertake the gesture of self-annihilation by effacing himself from the communication. The authorial surfacings that can be glimpsed in these brief references to the body of facts in his possession, and, by extension, to the labour that has

gone into the production of *On the Origin of Species*, signal Darwin's commitment to narration in the communication of his scientific theory. These references to the body of facts at his disposal are subtle moments in the text, easily forgotten by the assured reader, but their presence throughout all of its editions calls attention to the other ways in which the *Origin* refuses the mandates of objective science.

III.

Chapter One focused on Lyell's methods for the textual representation of causes now in operation. The product of a new movement in scientific epistemology, Darwin's text frequently betrays both its author's self-conscious awareness of the importance of transcending his own contingencies in the communication of his scientific findings, and his tacit refusal to comply with those same conventions. The rest of this chapter will be devoted to an exploration of the various ways in which Darwin can be observed to struggle both with the mandates of objective empirical science and with the inherent difficulty of representing causes now in operation. The temptation to enlist the imagination and figurative language to describe processes which cannot, in their natural course, actually be observed, did not threaten Lyell's sense of his own disinterestedness, nor is there any evidence that his contemporary readership even attended to his declared ability to overcome the limits of perception. Whereas Lyell felt free to enlist his imagination as, effectively, a scientific faculty, declaring "We are called upon, in our researches into the state of the earth, as in our endeavours to comprehend the mechanism of the heavens, to invent means for overcoming the limited range of our vision" (Lyell

33), in Darwin's text we can detect the attempted suppression of the creative imagination and its almost rebellious surfacings. Unlike Lyell, Darwin does not willingly clear a space for the "effort of both the reason and the imagination" (*Principles* I 81). And although Darwin has often been read (famously, by Gillian Beer, George Levine, and Sally Shuttleworth, among others)¹⁸ as the producer of a theory that functioned culturally almost as a natural force, its language and metaphors pervading the literature that followed it, its images becoming embedded in the cultural imagination, sufficient notice has not been given to the *struggle* in Darwin's own writing with the representation of causes now in operation. Instead, readings of the *Origin* usually focus on Darwin's "mingled tone of painstaking honesty, caution and self-criticism," or alternatively, and on the opposite end of the spectrum, his "romantic materialism which resulted in a desire to substantiate metaphor, to convert analogy into real affinity" – in short, his "profound imaginative longing" (Wallace 2; Beer *Plots* 37).

"Longing" plays a central part in Darwin's narrative. There are several kinds of longing that manifest in the text: the longing for more time with which to substantiate his "abstract" into an exhaustive treatise; the longing to fill the gaps, "the enormously long blank periods," in the fossil record; and the longing to witness the processes he describes (*Origin* 295). Although Darwin has a laboratory of sorts¹⁹ – in the form of his own experimentation in breeding and botany, or, as he terms it, artificial selection – his extensions of the evidence of artificial selection to modification, adaptation, and selection in a state of nature requires him to find ways of annexing the unseen. Witnessing, in the *Origin*, is always the product of the plastic secondary imagination, and it is invariably in moments in which Darwin wishes to offer a step-by-step panorama of the processes he

describes that the reader is treated not only to the metaphorical language in Darwin's arsenal, but to the incursion of Darwin's own subjectivity into the otherwise cautious, direct style of narrativization.

To address the role and the freedom afforded the imagination in the *Origin*, it is useful to begin with a passage largely restrained but occasionally flecked with moments of transcending the limits of perception. In order to convey the shifts in Darwin's language, I will quote at length. In his chapter on "The Imperfection of the Geological Record," he writes:

He who can read Sir Charles Lyell's grand work on the Principles of Geology, which the future historian will recognize as having produced a revolution in natural science, yet does not admit how *incomprehensibly vast* have been the past periods of time, may at once close this volume. Not that it suffices to study the Principles of Geology, or to read special treatises . . . and to mark how each author attempts to give an inadequate idea of the duration of each formation of even each stratum. A man must *for years examine* for himself great piles of superimposed strata, and watch the sea at work grinding down old rocks and making fresh sediment, before he can hope to comprehend anything of the lapse of time, the monuments of which we see around us. (293-4; italics mine)

Asserting first that the deep past of the earth is incomprehensibly vast, or not assimilable by the mind, Darwin immediately goes on to imagine a figure, a naturalist, or some version of himself, patiently watching, "for years," the superimposed strata of a great seaside cliff. This is in part a notation of the labour undertaken by the geologist,

signalling the enormity of his task in interpreting slow change. But it is also a claim for the special ability of the geologist's trained eye, and a subtle homily to his self-sacrificing patience. He goes on:

It is good to wander along lines of sea-coast, when formed of moderately hard rocks, and mark the process of degradation. The tides in most cases reach the cliffs only for a short time twice a day, and the waves eat into them only when they are charged with sand or pebbles; for there is reason to believe that pure water can affect little or nothing in clearing away rock. At last the base of the cliff is undermined, huge fragments fall down, and these remaining fixed, have to be worn away, atom by atom, until reduced in size they can be rolled about by the waves, and then are more quickly ground into pebbles, sand, or mud. But how often do we see along the bases of retreating cliffs rounded boulders, all thickly clothed by marine productions, showing how little they are abraded and how seldom they are rolled about! (294)

The passage begins and ends with meditations on how the activity of examining and watching inspires the mind with a sense of the extreme slowness of natural processes of erosion. Over the whole course of one's life, it is implied, tidal action might have next to no effect on the integrity of this great monolith of past upheaval and subsidence. But tucked between these two very measured accounts of the action of erosion Darwin deftly and radically speeds the action up. Suddenly "huge fragments" are falling away from the undermined cliffside, then his gaze shifts away from the macro- to the microscopic, and we are encouraged to picture the action of erosion in its most minute form, "atom by

atom.” He goes on to add that “He who most closely studies the action of the sea on our shores, will, I believe, be most deeply impressed with the slowness with which rocky coasts are worn away” (294) – thus closing the meditation with an affirmation of the limits of human perception. Examining strata and watching the erosive action of the sea will, for the most part, work to reinforce one’s conception of the yawning immensity of the time required for geological change. But the shift Darwin undertakes in this meditation, first privileging the motif of witnessing and then syntactically placing human time within the parameters of uniformitarian time (the wearing away of the cliff “atom by atom”), operates within its larger structure as a flicker of the kind of pliable temporality that Lyell embraced in his discussion of the power of the imagination to ‘restore’ to one’s knowledge events beyond the reach of experience.

That which flickers in Darwin’s text can be nursed to flame in fiction, where the creative imagination need not respect the boundaries of space and time, even in the description of scenes nearly identical to those that preoccupy scientific narratives. In Thomas Hardy’s *A Pair of Blue Eyes*, for example, a combination of omniscient narration and a character’s special imaginative ability dissolve the limits of perception. In a notation on the potential for intimacy between the human imagination and deep time, Hardy writes of his character Henry Knight that he “reclined hand in hand with the world in its infancy. Not a blade, not an insect, which spoke of the present, was between him and the past” (199). Clinging for his life to a cliffside on the Dorset coast, Knight’s vantage point is considerably more precarious than the one occupied by Darwin’s calm observer. The reader is encouraged to associate the duress of Knight’s circumstances with his sudden access to the whole past of the earth. Nevertheless, Knight’s mind opens to

deep time, and Hardy proceeds to grant him imaginative access to all the history of organic and inorganic phenomena. He writes:

By one of those familiar conjunctions of things wherewith *the inanimate world baits the mind of man* when he pauses in moments of suspense, opposite Knight's eyes was an imbedded fossil, standing forth in low relief from the rock. It was a creature with eyes. The eyes, dead and turned to stone, were even now regarding him. It was one of the early crustaceans called Trilobites. *Separated by millions of years in their lives, Knight and this underling seemed to have met in their place of death. It was the single instance within reach of his vision of anything that had ever been alive and had had a body to save, as he himself had now.*

The creature represented but a low type of animal existence, for never in their vernal years had the plains indicated by those numberless slaty layers been traversed by an intelligence worthy of the name. Zoophytes, mollusca, shell-fish, were the highest developments of those ancient dates. The immense lapses of time each formation represented had *known nothing of the dignity of man*. They were grand times, but they were mean times too, and mean were their relics. He was to be with the small in his death. (200; italics mine)

Though there is no direct evidence of Hardy having read Lyell's *Principles*, his library contained an annotated copy of Gideon Algernon Mantell's *The Wonders of Geology*, a geological manual written in the vernacular of natural theology, or, what Lyell called "antiquated dogma." First published in two volumes in 1838, *The Wonders of Geology*

offers a naïve and generally disorganized look at the fossil record and the earth's antiquity.²⁰ But it nevertheless supplied Hardy with the language of geology, and in the translation of scientific matter to fiction, Hardy's narrative is immediately positioned as a delineation of the imaginative consequences of a close look at the natural world. We are told that "the inanimate world baits the mind of man." The lure of nature, its power to fire the imagination, is precisely what objective science is designed to overcome. Renan warns against submitting to the momentum brought on by nature's power to inspire. Hardy, and the fiction for which his text stands-in, is, however, free to abandon himself to dwell in and unapologetically reconstruct in imagination events that surpass the possibility of experience.

In a remarkable passage on mental travel, Hardy writes:

Knight was a fair geologist; and such is the supremacy of habit over occasion, as a pioneer of the thoughts of men, that at this dreadful juncture *his mind found time to take in, by a momentary sweep, the varied scenes that had had their day between this creature's epoch and his own.* There is no place like a cleft landscape for bringing home such imaginings as these.

Time closed up like a fan before him. He saw himself at one extremity of the years, face to face with the beginning and all the intermediate centuries simultaneously. Fierce men, clothed in the hides of beasts, and carrying, for defence and attack, huge clubs and pointed spears, rose from the rock, like the phantoms before the doomed Macbeth. They lived in hollows, woods, and mud huts – perhaps in caves of the

neighbouring rocks. Behind them stood an earlier band. No man was there. Huge elephantine forms, the mastodon, the hippopotamus, the tapir, antelopes of monstrous size, the megatherium, and the myledon – all, for the moment, in juxtaposition. Further back, and overlapped by these, were perched huge-billed birds and swinish creatures as large as horses. Still more shadowy were the sinister crocodilian outlines – alligators and other uncouth shapes, culminating in the colossal lizard, the iguanodon. Folded behind were dragon forms and clouds of flying reptiles: still underneath were fishy beings of lower development; and so on, *till the lifetime scenes of the fossil confronting him were a present and modern condition of things.*

These images passed before Knight's inner eye in less than half a minute, and he was again considering the actual present. (200-201; italics mine)

Knight's mind effortlessly encases all of time. In the space of a moment, Knight's inner eye can envision every stage of the earth's development – for development it is in Knight's teleological assessment of organic and inorganic modification ever inching toward the great achievement, “the dignity of man.” As the fan of time unfurls its leaves, Knight's imagination moves easily from history to prehistory, and in one moment of thought, confidently aligns Macbeth's apparitions with the “lifetime scenes of the fossil confronting him.”²¹ Just as there is no distance between the observer and the object of his observation, there is no division of the products of history from those of nature. And though “the immense lapses of time ... had known nothing of the dignity of man,” this

man is granted the power to imagine them in their absence. Eye to eye with the Trilobite, Knight is thrust into the realization that “the lifetime scenes of the fossil confronting him were a present and modern condition of things,” which is to say that he is not only made aware of the causes now in operation, but is able to fathom and examine them.

IV.

Fiction has license to collapse in a sentence the products of civilization with those of nature, freedom to populate its narrative with scenes of the deep past, or to narrate the tiniest detail of modification as it occurs – and this annexing of the unseen and intertwining of discrete epistemological categories is a terrific power. In the attempt to narrate what, in Levine’s words, “wasn’t there and could never be seen” (*Darwin* 1), Darwin is forced to contend with the complex interdependency of his imaginative faculty with the evidence acquired by a painstaking observation of the operations of nature. Studies like Beer’s *Darwin’s Plots* and Levine’s *Darwin the Writer* explore how the processes of nature are alive to Darwin’s imagination. Such studies attest to the *Origin*’s advocacy of a unique flexibility of mind in promoting the achievement of the mental dexterity to move with ease between the concrete knowledge of species and the abstract idea of species change. And yet, a close look at the treatment of “imagination” in the *Origin* uncovers on Darwin’s part a deep unease. Writing about self-assessment in the autobiographies of Darwin and others, Levine notes that “the narrative of scientific epistemology ... implies a narrative of disciplined, self-denying progress through enormous difficulties toward a highly valued end, marked by constant repression of

desire” (*Dying* 87). The imperative, in objective science, to deny the self, to eschew one’s expectations, assumptions, and desires in the work of uncovering the truths of nature would seem to outlaw the imagination from the province of science. And indeed, in his direct references to the imagination Darwin exhibits a telling ambivalence.

In her book-length discussion of the imagination, Mary Warnock writes of David Hume’s views on the subject that “the imagination can . . . produce vivid images . . . from remote areas of space and time,” but that images produced by the imagination “will almost always be accompanied by emotions” (39-40). In *The Expression of the Emotions in Man and Animal* Darwin cites at length the French anatomist Pierre Gratiolet, whose work is described by Darwin as being “full of valuable observations” (13). Warnock’s assessment of Hume can be seen to echo Gratiolet’s sentiments, when he writes, “From all the facts I have listed, I conclude that the faculties of imagination and thought itself, though we consider them lofty and abstract, cannot operate without simultaneously awakening an emotional response” (13; translation mine).²² The imagination blurs together what we see with what we feel. For this reason it is an unsteady prism through which to consider natural processes. As Warnock writes, the “imagination is not only the helpful assistant; [it is also] the deceiver, who gives us an altogether unwarranted sense of security in the world” (25). The imagination’s power to deceive is a recurring motif throughout Darwin’s *Origin*, *The Descent of Man*, and *The Expression of the Emotions*. It is not until *The Descent of Man*, however, that Darwin directly evaluates the faculty of the imagination, claiming that “the Imagination is one of the highest prerogatives of man. By this faculty he unites former images and ideas, *independently of the will*, and thus creates brilliant and novel results” (95; italics mine). The imagination’s power to create,

to synthesize various, possibly unrelated images and ideas, and to circumvent the will in doing so, makes it a dangerous power indeed to one's objectivity. In *The Expression of the Emotions* Darwin describes the imposition of his own assumptions on the object of his observation, producing bias: "our attention thus distracted; our imagination deceives us" (25). And though the imagination may be one of the human's highest privileges, according to Darwin he shares the faculty with primates, dogs, and other "lower animals" of similar mental powers (*Descent* 43). It comes as no surprise, then, when Darwin writes in the *Descent*, that "of all the faculties of the human mind, it will, I presume, be admitted that Reason stands at the summit" (96). A similar sentiment is echoed in the *Origin*, where Darwin urges that the reader's "reason ought to conquer his imagination" in conceiving even of the "perfect and complex" eye as a product of natural selection (217-18).

In his notebooks C and D, Darwin aligns the imagination with fancy, superstition, error, and delusion. In Notebook C, he writes:

"evidence about old varieties is reduced to scarcely anything – almost all imagination" (C, 121:275).

"glimpses bursting on mind & giving rise to the wildest imagination & superstitions" (C, 244:316).

In Notebook D,

"D Israeli...accidentally says "—is distinctly marked as whole dynasties have been featured by the Austrian lip & the Bourbon nose". if this be not imagination" (D, 35:342).

“How far grander [is the idea of slow organic and inorganic modification] than idea from cramped imagination that God created.” (D, 36-7:343).

In Notebook M, on the biological origins of human behaviour, and N, on ‘metaphysical enquiries’ and expression, Darwin broadens the definition considerably. In Notebook M the imagination is a mechanism, a storage space in the mind, similar to memory, and a pleasure center. He writes:

When a man says I will improve my powers of imagination, & does so,—is not this free will,—he improves the faculty according to usual method (30:526).

Children like hearing a story told though they remember it so well that they can correct every detail, yet they have not imagination enough to <up> recall up the image in their own mind (28:526).²³

Pleasure of imagination, which correspond to those <he> awakened during music. (39:528)

There is much imagination in every view. (41:529).

When the conscience tells our mind good has been done ... pleasure of intellect affection excited, pleasure of imagination (119:549).

In Notebook N, however, Darwin offers something like a definition of the term, saying that:

When one sees in Cowper, whole sentences spoken & believed to be audible, one has good ground to call imagination a faculty, a power, quite distinct from self. <<or will>> (94:590).²⁴

The opinions expressed in the above passages from Darwin's notebooks can be detected in the *Origin*. In the notebooks, the imagination is, diversely, an illusion-maker that steps in when "evidence . . . is reduced to scarcely anything," and kin to "superstition," and thus "irrational, unfounded, and based on fear or ignorance" (*OED*). In Notebook D's passage on Israeli, "imagination" is synonymous with 'error'. But it is also, as in the passages from Notebook M, a faculty that can be harnessed, and something that is improved with age and the growth of the mind. When the imagination is directly addressed in the *Origin* it is either as an illustrative tool, or as a faculty unequal to the task of conceiving the immensity of time needed for the process of natural selection.

Seeing the imagination as a mechanism at his disposal, Darwin writes:

[W]e ought in imagination to take a thick layer of transparent tissue. . .
.(219)

Or,

[I]t is good thus to try in our imagination to give any form some advantage over another. . . .it will convince us of our ignorance on the mutual relations of all organic beings. (129)

And, elsewhere,

[I]f we wished in imagination to give the plant the power of increasing. . .
 . (128)

In these instances, and there are several of them, Darwin treats the imagination as an access-point for a kind of secondary materiality. As I will elaborate in Chapter Three, in my discussion of Freud's materialization of thought, Darwin here treats the products of the imagination as if they had the density of matter. He refuses to speak in what Whewell called "theory," hoping instead that the reader will follow him into his "imaginative illustrations," which, he says, he "must beg permission to give," all the while understanding them to be the result of painstaking inductive reasoning (*Origin* 138).

When Darwin addresses the imagination directly it is also to focus on the difficulty of the task he is assigning his reader. He surfaces in the text to acknowledge that the work of assimilating the mind to the immensity of deep time – and to the complex image of the world clothed in innumerable interrelated forms of life being born, living, struggling, dying, and going extinct, all the time – could seem impossible, and that the complex operations of nature could appear "insuperable to the imagination."²⁵ He writes:

Nothing is easier than to admit in words the truth of the universal struggle for life, or more difficult – at least I have found it so – than to bear this conclusion in mind. Yet unless it be thoroughly engrained in the mind, I am convinced that the whole economy of nature, with every fact on distribution, rarity, abundance, extinction, and variation, will be dimly seen or quite misunderstood. (116)

And elsewhere,

It is highly important for us to gain some notion, however imperfect, of the lapse of years. During each of these years, over the whole world, the land and the water have been peopled by hosts of living forms. What an infinite number of generations, which the mind cannot grasp, must have succeeded each other in the long roll of years! Now turn to our richest geology museums, and what a paltry display we behold. (297)

The staggeringly populous past and present that Darwin seeks to represent defies representation, and even thought. The lapse of years needed for the construction of monuments like the aforementioned cliffside boggles the mind, and yet Darwin writes that “all that we can do, is to keep steadily in mind” an idea of the lapse of years of the roiling economy of nature (129). The self-discipline that Darwin requests of his reader is matched in the text by the restraint exhibited in his imaginary illustrations. Through them, Darwin foregrounds the conscientious disavowal of the troubling potential of the imagination to deceive the mind, or circumvent the faculty of reason – that great exercising of the will over thought – providing a model through which the reader may observe and emulate the scientist’s attainment of the desirable state of disinterestedness.

V.

Mary Warnock defines the imagination as “the faculty of forming images of objects in the world” (129). Darwin’s task is to form images of objects which are not in the world, as such. He finds ways to negotiate this difficulty. He fashions a laboratory of sorts, where the operations of variation under domestication are observed and catalogued,

both by himself (in his pigeon-fancying, his experiments on weeds in his own garden and plants in his own greenhouse, and on the survival-rate of seeds immersed for various durations in seawater, to name only a few of his numerous projects), and by the many correspondents with whom he communicates.²⁶ The verifiable and falsifiable evidence provided by his research into what he calls artificial selection – a term which refers both to the evidence from breeders and fanciers, as well as evidence derived from botanical experimentation – enables Darwin to make the mental leap to variation in the state of nature by the operations of natural selection. When he must provide examples of the various processes he wishes to describe, Darwin sketches his imaginary illustrations. But on a few occasions, Darwin seizes on an image or an idea and produces passages of remarkable – and, I suggest, defiant – imaginative plasticity. In these moments, Darwin does not so much as mention the imagination.

The first of these passages to be explored sees Darwin drawing out his evocative “simile” of “The Great Tree of Life.” As Lyell’s crucial concept of the imagination’s power to restore to the mind the events of the deep past was part of his thinking from a very early point in his geological career, so the image of the tree was, from his earliest meditations on transmutation, Darwin’s chosen motif. From as early as the summer of 1837 Darwin had begun to sketch an idea of the great tree of life. In Notebook B, the first of Darwin’s notebooks exclusively on the transmutation of species, he writes that “The tree of life should perhaps be called the coral of life, base of branches dead; so that passages cannot be seen” (25:177). Thus the first single-specimen image Darwin invokes to represent his idea of speciation from a common parent takes the form of the coral, a single-skeleton organism whose growth, unlike a tree, is lateral, ever accumulating,

expanding ring-like, from atop and around “parent” branches. Darwin’s fascination with the coral reefs described by Lyell, and, later, with those he was able to study in person at the Keeling or Cocos Islands in the Indian Ocean, is well catalogued in his *Journal of Researches* – which details his journey aboard the *HMS Beagle*. Indeed, of the three images in Notebook B of the “tree of life,” the most detailed also most resembles a coral rather than the more arborous image he describes in the *Origin* (see Plate 2). In 1837 Darwin had just returned from his five-year voyage aboard the *Beagle*, and was occupied with preparing his extensive journals for publication. It is not surprising that the coral, to which he devotes the majority of Chapter 22 in the *Journal of Researches*, should have pride of place in his imagination. But that Darwin began his consideration of a single, unifying image to stand in for the complex process of speciation with the coral, whose form evokes the notion of an ecosystem – of the indivisible interrelatedness of life, growth, movement, and death – and ended with a tree, a much more hierarchical structure, where sequences in growth are more easily detected, marks an arresting shift in thought.

Replacing the image of the coral, whose dead skeleta endure as part of the larger living structure, with that of the tree, a vertical structure, with a much more straightforward process of growth and death, Darwin simplifies his simile and renders it more manageable to narrativization. A tree, which grows ever upward and outward from a single visible base, and which sheds its dead branches, lends itself more readily to a textual visualization of sequential expansion, and development. And Darwin’s description of “the great Tree of Life” is one of a few distinctly narrative moments in the *Origin*. He writes:

The affinities of all the beings of the same class have sometimes been represented by a great tree. I believe this simile largely speaks the truth. The green and budding twigs may represent the long succession of extinct species. At each period of growth all the growing twigs have tried to branch out on all sides, and to overtop and kill the surrounding twigs and branches, in the same manner as species in the great battle for life. The limbs divided into great branches, and these into lesser and lesser branches, were themselves once, when the tree was small, budding twigs; and this connexion of the former and present buds by ramifying branches may well represent the classification of all extinct and living species in groups subordinate to groups. Of all the many twigs which flourished when the tree was a mere bush, only two or three, now grown into great branches, yet survive and bear all the other branches; so with the species which lived during long-past geological periods, very few now have living and modified descendents. . . . As we here and there see a thin straggling branch springing from a fork low down in a tree, and which by some chance has been favoured and is still alive on its summit, so we occasionally see an animal . . . which in some small degree connects by its affinities two large branches of life, and which has apparently been saved from fatal competition by having inhabited a protected station. As buds give rise by growth to fresh buds, and these, if vigorous, branch out and overtop on all sides many a feebler branch, so by generation I believe it has been with the great Tree of life, which fills with its dead and broken

branches the crust of the earth, and covers the surface with its ever
branching and beautiful ramifications. (171-2)

One of the objectives of narrative is to dissolve the distance between the reader and the events being described. Through the expansion of the simile of the tree, the function of this passage in the larger textual body of the *Origin* is to allow the reader to feel she is witnessing the growth of this great tree of life, from a bush to a monolith, and, by analogy, gain insight into the process of speciation. As Hayden White points out, narration “translate[s] *knowing* into *telling*,” but it also imposes sequentiality, continuity, and, most importantly, a storyteller, onto its subject.²⁷ In a text that often signals the imperative to project a disciplined, disinterested, objective epistemological model, and which repeatedly seeks to disassociate itself from the imagination and its implications for objectivity, a passage like this one stands out. Here, Darwin refuses the mandate to call attention to the imaginary in his illustration. Instead, he gives his imagination free reign, and unapologetically sketches a broadly associative image of modification.

George Levine writes that this passage “is not only precise, but it soars into something like lyrical beauty” (*Writer* 105). Levine points to instances of alliteration and internal rhyme which transform the passage from a thought experiment to a visual image – a material presence in the text.²⁸ Indeed, Gillian Beer writes that this ““materialization” of the image is important in understanding its force for him. It was substantial, a condensation of real events, rather than a metaphor” (*Plots* 33). And both Levine and Beer read this passage as one of the instances in Darwin’s text of the “generous semantic practice” that made his theory lucid to the minds of his readers (*Plots* 33).

In fact, and as Levine also points out, the passage is defined by Darwin not as a metaphor, but as a simile. Levine takes Darwin at his word, but I would like to suggest that in addition to evincing Darwin refusing the mandates of objectivity and giving his imagination free associative range, the passage also traces a movement from the more objective and disciplined form of simile to the far less rational form of metaphor.

Beginning with a comparison, “The green and budding twigs may represent existing species,” Darwin sets out a narrative pattern of ‘as tree ... so species’ in drawing out the resemblances between the tree’s growth pattern and speciation. Limbs divide and subdivide “into lesser and lesser branches” as species divide into variations; both derive from a single original “budding twig.” The preferability of the tree motif to that of the coral is evidenced by the passage on extinction, in which Darwin writes that from “the first growth of the tree, many a limb and branch has decayed and dropped off; and these lost branches...may represent those whole orders, families, and genera which have now no living representatives.” Unlike coral, which retains vestiges of its former incarnations, the tree sloughs off its dead branches, making it a far simpler model for the narration of extinction.

In the final long sentence of the passage Darwin moves from simile to metaphor. Whereas the semantic structure has been established – ‘as tree ... so species’ – the final sentence adopts the structure ‘as tree ... so tree’. In other words, having specified species or speciation as the tenor and the tree of life as the vehicle in the comparative model, the passage shifts in the final sentence to dwell in far more figurative language. Suddenly the reader is faced with a vehicle-vehicle structure, as the tenor is disappeared from the passage and only the metaphor of the tree remains. The tree stands in for species, and as

the etymology of “metaphor” suggests, the semantic gesture has a transportive effect.²⁹ Both the reader and Darwin are carried away into the associative imagination, and Darwin’s occasionally panglossian tone surfaces to admire the “beautiful ramifications” of the tree filling “with its dead and broken branches the crust of the earth.” It is in these last few lines of the passage that we begin to glimpse Darwin most fully shrugging off the mandates of objective science. Here is a rhapsody on the beautiful harmony of natural processes. It is unapologetically given, and no attention is drawn to its incursion into the text.

In his chapter on geographical distribution, Darwin carries his imaginative illustration of natural processes to its heady extreme. Following a discussion of the confounding similarities of alpine and arctic plants, and of the occasionally extreme remoteness of some mountain flora, Darwin offers a detailed illustration of a new Ice Age in order to demonstrate what, he says, “I believe, actually took place” (362). In his passage on flora and fauna dispersal during and after a glacial period, Darwin unflinchingly gives real events the form of a story, with well-marked beginning, middle, and end points. He writes:

[Let us suppose] a new glacial period to come slowly on, and then pass away, as formerly occurred. As the cold came on, and as each more southern zone became fitted for arctic beings and ill-fitted for their former more temperate inhabitants, the latter would be supplanted and arctic productions would take their place. The inhabitants of the more temperate regions would at the same time travel southward, unless they were stopped by barriers, in which case they would perish. The mountains would

become covered with snow and ice, and their former Alpine inhabitants would descend to the plains. By the time that the cold had reached its maximum, we should have a uniform arctic fauna and flora, covering the central parts of Europe. (360)

Tracing the “new glacial period” from its earliest manifestations through the dispersal and widescale perishing of the world’s plants and animals, and all the way to the reinstatement of normal climate ranges, Darwin visualizes the entire process for the reader. A privileged witness, he invites us to observe the shifts, both subtle and drastic, consequent on a glacial climate. Time is sped up immeasurably. In the space of three sentences, arctic productions supplant ill-fitted inhabitants of a given region, mass migration displaces all unsuited animal life, and the final deep freeze of the glacial winter is established, in which “we should have a uniform arctic fauna and flora, covering the central parts” of Europe, the majority of Spain and the United States. In the second paragraph “warmth return[s]” and the reader is treated to another brief notation of the reinstatements of temperate regions. Darwin writes:

As the warmth returned, the arctic forms would retreat northward, closely followed up in their retreat by the productions of the more temperate regions. And as the snow melted from the bases of the mountains, the arctic forms would seize on the cleared and thawed ground, always ascending higher and higher, as the warmth increased, whilst their brethren were pursuing their northern journey. Hence, when the warmth had fully returned, the same arctic species, which had lately lived in a body together on the lowlands of the Old and New Worlds, would be left

isolated on distant mountain-summits . . . and in the arctic regions of both hemispheres.

Thus we can understand the identity of many plants at points so immensely remote as on the mountains of the United States and of Europe. We can thus also understand the fact that the Alpine plants of each mountain-range are more especially related to the arctic forms living due north or nearly due north of them. (360-61)

Describing, as it does, the effects of hundreds if not thousands of years of very slow change, this passage visualizes flux within a coherent, continuous narrative structure. As with Lyell's *Principles* the non-sequiturs of nature are transformed into narrative, and as in Lyell's notation on the erosion of the Rhone valley, the simplification of geological and organic processes allows Darwin to imagine the encroachment, establishment, and recession of a glacial climate in what James Krasner describes as "imageable arcs of motion" (124).

Accelerating the process in order to fit it into the confines of narrative description, Darwin lends a directionality, even almost an agency, to the migrants he describes. Unlike bird migrations, the southward and northward displacements resulting from the new glacial climate would have been almost imperceptibly slow encroachments, rather than the directed movement Darwin describes. The cinematic quality of this passage recalls what is perhaps the most discussed paragraph in the *Origin*: the passage in which Darwin contemplates an entangled bank, addressed at some length in Chapter 1. In both cases the reader is invited to imagine the dissolution of the limits of observation, and to locate in the narrator a figure whose patience, attentiveness, painstaking accumulation of

evidence, and authority entitles him to cast himself as transcending the mandates of objective science and occupying a fictional point of view. As he did in the tree of life passage, so again with the new Ice Age and entangled bank passages, Darwin refuses to call attention to the imagination in his illustrations.

VI.

On the Origin of Species foregrounds three figures with sufficient patience and insight to observe the operations of nature. In the narrative structure of the *Origin*, they are ranked in descending order: Nature itself, Darwin, and the breeder. In the first chapter, Darwin details the insights afforded him by his own and others' efforts in artificial selection in animal breeding and botany. In "Variation Under Domestication" the reader is urged to conceive of man's power to single out and select for certain desirable characteristics in a given organism, and thus to manipulate its form, as an argument for the possible existence of a similar process in nature. Breeding and plant hybridization, Darwin insists, have shown the organization of plants and animals to be "something quite plastic" (90). Why, then, so the logic goes, would we assume that the natural world is populated by rigid, immutable, forms? In his discussion of man's power to select for certain characteristics and to modify organic forms Darwin cautions that "Not one man in a thousand has accuracy of eye and judgement sufficient to become an eminent breeder" (91). Though he attends to the unconscious selections of "uncivilized" man – who might, for example, allow the healthiest of his animals to breed more often, or choose only the hardiest from among the offspring of certain animals and plants – the

breeder is nevertheless established early on as possessing a special insight into the natural world.

But we are soon told that “man can hardly select, or only with much difficulty, any deviation of structure excepting such as is externally visible; and indeed he rarely cares for what is internal” (96). Though man possesses the power of accumulative selection, being able to add up “in certain directions useful to him” various characteristics, and in this way “may be said to make for himself useful breeds,” he lacks nature’s power to give “successive variations” because his modifications are superficial (30). Nature, or more precisely the agency of natural selection, on the other hand, is said to be “daily and hourly scrutinizing” (133). Though man has some insight, nature is the favored patient observer in the *Origin*. Over and above Darwin, who has spent half his life painstakingly accumulating a wealth of observations and facts about the operations of the natural world, Nature is the text’s personified visionary.

Natural selection, Darwin writes,

is daily and hourly scrutinizing, throughout the world, every variation, even the slightest; rejecting that which is bad, preserving and adding up what is good, silently and insensibly working, wherever and whenever opportunity offers, at the improvement of each organic being in relation to its organic and inorganic conditions of life. (133)

In the *Origin* real action, real change, is the province of nature. Natural selection “is a power incessantly ready for action, and is as immeasurably superior to man’s feeble efforts, as the works of Nature are to those of Art” (292). Ever vigilant, and able to “act on each part of each being,” natural selection is established as the text’s privileged

witness, the patient watcher overseeing all things at all times (187). And as natural selection is developed as an agent in the text, man is increasingly narrativized in terms of blindness or inadequacy. Combining the trope of nature as a willed force with the developing discourse of man's limitations, Darwin writes:

Nature may be said to have taken pains to reveal, by rudimentary organs, and by homologous structures, her scheme of modification, *which it seems that we willfully will not understand* (480; italics mine).

Here, nature seems to want a detective. Rudimentary organs, homologous structures, and her scheme of modification are clues she has planted, as she waits patiently for man to catch up to her. Though Darwin reserves a special status for himself, as the very detective wanted by nature, he nevertheless continually emphasizes the superiority of her power of selection over man's. He laments:

How fleeting are the wishes and efforts of man! how short his time! and consequently how poor will his products be, compared with those accumulated by nature during whole geological periods. Can we wonder, then, that nature's productions should be far 'truer' in character than man's. (133)

Whereas Darwin can frequently be seen to refuse to efface himself from the text – in frequently privileging his own narrations over the more objective alternatives at his disposal – in his transferral of the power of observation, action, and true results from man to natural selection he very subtly displaces himself as the text's primary agent. Man, and by extension, even Darwin are feeble forces of insight or change when compared to the uniform, slow, and actual operations of nature.

Through the metaphor of natural selection, Nature – which scrutinizes, guards against, takes pains to reveal, and acts on each part of organisms – becomes an agent of action in the *Origin*, but it must be acknowledged that Darwin always also seeks to establish what John Angus Campbell calls “a sense of literalness,” in which the metaphorical term “natural selection” can be seen to describe a real process within the impersonal non-directional operations of nature (364). As with the relationship of immense, impersonal geological processes to the narrative structure of uniformitarianism, which yokes together non-directional forces into a narrative sequentiality, and thus a structure conceivable by the imagination, so Darwin must to some extent falsify the operations of nature in order to represent them with the narrative concept “natural selection.” In narrativizing natural processes, Darwin is forced to adopt the language of agency – of will and desire – to describe a process devoid of directionality. This prompts him, in the third edition of the *Origin*, to issue an apology for his personifications of nature, and essentially to describe “natural selection” as a misnomer. He writes:

In the literal sense of the word, no doubt, natural selection is a false term; but whoever objected to chemists speaking of the elective affinities of the various elements?—and yet an acid cannot strictly be said to elect the base with which it will in preference combine. It has been said that I speak of natural selection as an active power or Deity; but who objects to an author speaking of the attraction of gravity as ruling the movements of the planets? Every one knows what is meant and is implied by such metaphorical expressions; and they are almost necessary for brevity. So again it is difficult to avoid personifying the word Nature; but I mean by

Nature, only the aggregate action and product of many natural laws, and by laws the sequence of events as ascertained by us. With a little familiarity such superficial objections will be forgotten. (85)³⁰

In fact, and as Campbell points out, the answer to Darwin's question, "whoever objected to chemists speaking of the elective affinities of the various elements?" is the positivist Auguste Comte himself, who had strongly objected to the presence of metaphorical language in scientific treatises, arguing that figurative language operates as a kind of metaphysical incursion which threatens to destabilize positivist conclusions (366). But more to the point, Darwin's claim that figurative language is "necessary for brevity" is belied by the extent to which he breathes life into the figure of natural selection, that is, the degree to which he personifies the process. The operations of nature are immense, spanning millennia, and "natural selection," as uniformitarianism did for Lyell, provides Darwin with the means by which to narrativize that which is non-sequential, non-directional, non-agential. For Darwin, nature, which "acts uniformly and slowly" must be accelerated into the figure natural selection in order for the story to be communicable (292). In other words, the falsification of the operations of nature with the figurative language of natural selection is not "necessary for brevity" but rather is necessitated by putting the process into language.

While I agree with Campbell's argument that the metaphorical language in Darwin's text demonstrates a savvy manipulation of its Victorian readership's affinity for the language of design – and that in this way natural selection stands as a rhetorical intervention, drawing the reader in with the familiar language of natural theology, and then utterly reversing the expected meaning – I suggest that in addition to this, Darwin is

at pains to create a kind of protagonist in the *Origin* through whom he may efface himself, and his narrative agency, from the text. The requirements of the new epistemic virtue of objectivity urge that Darwin fade his ego out from the elaboration of his scientific theory. But as we have seen evidence of his reluctance to comply with the mandates of objective science, here we see that instead of performing the ritual of self-abnegation demanded of him, Darwin instead replaces his own ego and agency with that of natural selection. The resulting paradox is a text which most closely adheres to the mandates of objective science in precisely those moments in which it is most overtly privileging its author's own imagination and his construction of a figurative vernacular for the concept he seeks to explain. Having displaced himself as the text's primary agent, Darwin occasionally surfaces, as with his imaginary illustrations, to insist on the primacy of the faculty of reason, but may fade into the background when it becomes necessary to weave the metaphysical into the material, as with the tree of life, the new Ice Age, and the entangled bank passages.

VII.

In 1816, when Darwin was seven years old, he and his sister Catherine, one year his junior, posed for a portrait (see Plate 3). In it, Darwin and Catherine adopt attitudes of mock courtship, with Darwin kneeling opposite Catherine, seated on a stool and clutching a wilting bouquet of flowers. Darwin holds a potted plant, apparently a favorite from his father's hothouse.³¹ Though their bodies are positioned in conventional poses of courtship, their faces, turned toward the artist with open, happy expressions, reaffirm the

innocence of their actual age.³² In addition to the courtship motif, the portrait is notable for its citation of another convention of portraiture. The inclusion of two potted plants in addition to cut flowers yokes the drawing to a standard of Victorian daguerreotype portraiture, which it can be seen to anticipate. These images often display their subjects in a pseudo-domestic setting, with a potted plant carefully placed nearby to suggest a drawing room or, more generally, a comfortable, easy atmosphere to naturalize the often severe expressions necessitated by the protracted photographic process (see Plates 4-8).

The portrait was displayed in the Darwin household throughout Charles's youth, and was later hung in his sister Caroline Wedgewood's home, Leith Hill Place, in Surrey (it now hangs at The Darwin Museum at Down House, Kent). Though it is never specifically mentioned by Darwin, a picture of himself as a child with his favorite sister would not have escaped his notice in later life. The prescience of the image is remarkable, if one is disposed to read it that way. Here is a study of a born naturalist: the child, father to the man, holding a prized specimen from the family hothouse. This is, in fact, how the portrait has generally been read – though lightheartedly – by Darwin's biographers and those critics who have commented on it. The portrait's ties to conventional forms of artistic representation, however, suggest that rather than attempt to express the character of its subjects, the picture's design is the consequence of certain formalities of the genre of portraiture. But when Darwin decided, in 1838, and, later, in 1876, to write his autobiographies, a portrait like this one, and its suggestion of a certain continuity between a childhood disposition and an adult vocation, undoubtedly played a part in the organization of his recollections of childhood.

By 1838 Darwin had begun to build a strong reputation as a naturalist: through the public reading, by John Stevens Henslow, of extracts of his letters from the *HMS Beagle* to the Cambridge Philosophical Society in 1835³³; by the warm reception of his botanical, geological, and fossil collections from his five-year journey; and from the encouragement he received to compile his notes from the journey into book form (these were published as the *Journal of Researches* in 1839). This first flush of success, combined with the prospect of marriage (he and Emma were wed in January, 1839), and the fact of having his personal impressions of South America and Oceania widely disseminated, turned Darwin's mind to thoughts of his legacy and of his own development into the man of substance he was discovering himself to be. As a result, he produced the first of two autobiographical documents.

Entitled *An Autobiographical Fragment; Life. Written August – 1838*, the first autobiography shows Darwin preoccupied with the discovery of his origins.³⁴ Though it is a mere five pages long, the text is a powerful statement of Darwin's desire to identify a linear connection between his present and past selves. On the cusp of developing his first thoughts about mutation and variation, species mutability, and the tiny but crucial role of the individual life in the inheritance and communication of advantageous characteristics from one generation to the next, Darwin wrote a text whose most salient motif displays a life marked not by deviation or development, but by fixity and antecedent causes.³⁵ The *Autobiographical Fragment* was written the same year as "Notebook M," which sees Darwin exploring questions of human origins, memory, the biological origins of behaviour and the expression of emotions, the function of the imagination, and transmutation. Like his notebook, the *Fragment* is written in a style that seems almost to

hearken forward to the clipped, halting formulations of telegraphese; articles and conjunctions are often abandoned, and Darwin is generally satisfied to communicate in fragments. This style enables Darwin to unselfconsciously repeat himself, and the text takes on a tone of automatic writing, or dream narrative. Indeed, it often reads like a description of a dream, as when, on the first page, Darwin writes, “&I think my memory is real,” or “My memory here is an obscure picture,” and again, “I have obscure picture of house before my eyes” (1).

Memory itself, even more than the life he appears to be recollecting, is the subject of the *Fragment*. Writing, over the course of a single page, “—I think memory of events commences abruptly,” and “—Some very early recollections are connected with fear,” and “All my recollections seem to be connected most closely with self,” and, “only remember affairs personal,” and, later, “I do not remember any mental pursuits,” Darwin’s rhythmic fervor suggests a certain distress at the possibility that he will be unable to recall the mental ties that unify his present and past selves as one continuously existing animal (2, 3). Indiscriminately piling memory fragment upon memory fragment, he does not succeed in providing a unified picture of his young self. Rather, we have a picture of a man deeply preoccupied with how experience is imprinted on the mind, and confronted with the difficulty of communicating his own development. His past seems to threaten constantly to slip away from his grasp – memories are often obscure, rarely distinct – and as is often the case in the *Fragment*, his syntax here emphasizes a general feeling of unease. The reader is further alerted to breakage in memory by the constant use of the dash, which lends the text a visual fragmentation.

Unable to discover his origins in a coherent sense, Darwin resorts to self-mythology, and it is along these lines that the portrait of himself with his sister Catherine makes its way into the narrativization of the antecedent causes linking his remembered child self with his adult embodiment. Darwin writes, “—I scarcely ever went out walking without saying I had seen a pheasant or some strange bird, (natural History taste)” (3). In three parenthetical words Darwin unifies the little boy holding a potted plant with the grown man, an amateur natural scientist. Whereas in the *Origin* Darwin continuously insists upon his own imaginative faculty, his special means of insight into the operations of nature, in the *Fragment*, his interests, and indeed his life course, are not the result of a curiosity developed into a vocation, or of a set of special and unique talents, but are instead the consequence of inborn characteristics. Here, Darwin describes himself as a congenital naturalist. The phrase “(natural History taste)” – which identifies the kernel of his current passions in his young self – is soon followed by the far more absolute “—I was born a naturalist—” (3, 4). From a parenthetical musing, Darwin reiterates the sentiment more forcefully and dramatically through the underlining effect of the dual dash, but also cancels the socially cultivated “taste,” replacing it with the language of an innate or constitutive characteristic (“born a naturalist”). Like a note to himself, underlined to isolate it from the surrounding text, “—I was born a naturalist—” is not only grammatically unique in the *Fragment*, but occurs so near the end as to function as a conclusive statement on the life sketch. Following a torrent of fragmentary memories sketched out in halting prose, Darwin not only makes a claim for a linear continuum in his own life and development, but disavows any material that might paint a picture of his own special character, favoring instead a series of clipped and scattered and

discontinuous memories held together by his repeated assertion that he is the result not of a nurtured curiosity and set of interests but of an inborn nature.³⁶

Nearly forty years later, in 1876, Darwin again undertook the task of autobiography – this time more systematically, offering, in broad strokes, a portrait of the whole life (though once again quite briefly). From the first autobiographical text, which reduces the trajectory of his life to an original directive in the essential organization of his organism, Darwin returns, in spite of decades of work on divergent, adirectional flux in the natural world, to the language of permanence in the individual life. On the second page of this later *Autobiography*, the Darwin of the earlier *Autobiographical Fragment* resurfaces to declare:

The passion for collecting, which leads a man to be a systematic naturalist, a virtuoso or a miser, was very strong in me, and was clearly innate, as none of my sisters or brother ever had this taste. (7)

As in the *Autobiographical Fragment*, Darwin's rhetoric is designed to bypass the uncertain terrain of interpretation, implying instead that Darwin, to the best of his ability, is presenting the reader with facts. As with the parenthetical assertion, "(natural History taste)," Darwin's tone here is conclusive rather than interpretive – the interests that carried him through life were "*clearly* innate." Observing himself as a specimen, Darwin does not deal in the metaphysical or speculative – the murky territory of his own complex and particular psychic organization. Indeed, he treats himself like a living fossil, declaring in the first paragraph:

I have attempted to write the following account of myself, as if I were a dead man in another world looking back on my own life. Nor have I found this difficult, for life is nearly over with me. (6)

As Levine points out, here Darwin seems to want to liberate himself from all his human contingencies, and to assume the attitude of self-abnegation mandated by objective science (*Dying* 99). While I agree with Levine, it is worth noting that Darwin spent the majority of his adult life suffering from an obscure intestinal illness probably acquired during his journey aboard the *Beagle*. In other words, he spent his adult life contemplating not only struggle, competition, scarcity, and death in nature, but indeed the various biological obstacles to his own life.³⁷ At the age of 67, and having, over the course of forty years, endured numerous “water cures,” frequent long periods of bed-rest, and constant retching and pain, imagining himself “as a dead man” was not a great imaginative stretch.

But to return to his statement of intent, it is arresting that Darwin should assume, in observing himself, the very vantage point necessitated by the object of his lifelong scientific pursuits. As the investigation of a species necessitates beginning at the present end-point and working backward through dislocating aeons of deep time, so the life is observed, as if from “another world,” and another time. Unlike the other prominent men of his day who undertook the autobiographical project – Thomas Carlyle, John Stuart Mill, and John Henry Newman – Darwin’s concern is not to trace the development of his mind, or to position himself as a sage whose life-philosophy might act as a guide for the reader. Instead, for Darwin autobiography provides a space for a case-study. Just as the empirical scientist cannot fathom the operations of mind in the objects of his interest,

whether they be living specimens or fossils, but must instead be satisfied to enumerate an organism's constitutive parts, so Darwin seeks in his autobiography to apply himself to what he considers to be his essential materiality. The metaphysical elements that make him unique – his particular genius – are almost entirely excised from the text.

In discussing Darwin's theory of speciation, Gillian Beer observes that:

The individual organism does not evolve in the course of its life. Though it takes part in the evolutionary process, it does so only through generation, not through any happening within its own life cycle. The individual is thus both vehicle and dead end. (2003 38)

Though this is not strictly true – while evolution, or natural selection, does not, in Darwin's view, occur within the individual life cycle, the “happening” of mutation, a crucial part of the evolutionary process, does – Beer's point, that evolution cannot be observed in the single lifespan, is important, especially to a discussion of Darwin's attempt to map such a thing. Darwin's autobiography shows his utter refusal to champion the individual life, even his own. Only guesswork can illuminate the individual organism's relationship to the larger collective, and to attempt to distinguish the single organism's part in the tangle of roiling life would require stretching, to its breaking point, the transcendent perspective employed by Darwin in the *Origin* to illustrate natural processes. While in the *Origin* Darwin is willing to exercise imaginative license in describing processes that unfold over vast stretches of time, he remains staunchly unwilling to exercise such license in describing his own life process. Paradoxically perhaps, his autobiographical texts find him hewing much more strictly to the tenets of empiricism than his more properly scientific writing.

In their shared emphasis on the “innate” qualities that operate in the life of the individual almost as directives, the two autobiographical texts appear to accord with one another. And while, as I have been suggesting, they seem unified in their divergence from the argument and language of development at the center of Darwin’s *Origin*, on the subject of psychology and mental development the autobiographies subtly evidence a shift in Darwin’s thinking about individual development in the intervening years between 1838 and 1876. Writing far more anecdotally in the second autobiographical text, Darwin can, quite unexpectedly and very briefly, be seen to echo the *Origin*’s developmental ethos. Near the close of the 1876 text, Darwin posits himself as a case study informing the work that, he says in the *Origin*, constitutes the next step in biological science: research into the relationship of mind and brain. Near the end of the *Origin* he writes,

In the distant future I see open fields for far more important researches. Psychology will be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation. Light will be thrown on the origin of man and his history. (458)

And in his autobiographical case-study the only instances in which Darwin links his text to his species work are concerned with this question of the acquisition of mental powers, and of mutation (or development) in the brain. In keeping with the views expressed in the *Fragment*, Darwin says,

I am inclined to agree with Francis Galton in believing that education and environment produce only a small effect on the mind of any one, and that most of our qualities are innate. (20)

But he later declares, of the period following his return from the *Beagle* journey:

The primeval instincts of the barbarian slowly yielded to the acquired tastes of the civilized man. That my mind became developed through the pursuits during the voyage, is rendered probable by a remark made by my father, who was the most acute observer whom I ever saw, of a sceptical disposition, and far from being a believer in phrenology; for on first seeing me after the voyage, he turned round to my sisters and exclaimed, “Why, the shape of his head is quite altered.” (44)

Suddenly, ontogeny recapitulates phylogeny, and Darwin’s life is, for the first and only time, described as being made-up of stages of development. Though perhaps easily dismissed as rhetorical hyperbole, the sentiment expressed by the superimposition of species development onto his own gradual sobering into a serious man of science nevertheless operates as an important incursion into the body of the autobiography. It marks the only contemplation in that text of a fundamental change taking place over the course of the individual human life. Mental development, however, is understood in material terms. Reaffirming observations recorded in “Notebook M,” where he writes, “One is tempted to believe phrenologists are right about habitual exercise of the mind, altering form of head, & thus qualities become hereditary,” and, later, “(& phrenologists state that brain alters),” Darwin makes, in the autobiography, an earnest case for the development of his mind through the evidence afforded by his father’s phrenological observation (526:30, 533:57). Thus, tucked into a larger narrative preoccupied with the task of declaring the individual life to be prescribed by inheritance and barely of note, and with a detailed description of his own limitations, here is a passage in which Darwin makes a very brief but unexpected and significant case for the imprint the life process

makes on our individual bodies, and, inferentially, for the hereditary value of the individual. Suddenly, the motif of species development and species flux, over generations, is mapped onto the individual life, and specifically, onto the brain, and the *Autobiography* ends with the same musing as the *Origin*. While Darwin's thinking is constrained by the material terms of phrenology – the concept that the brain and its casing could actually change shape as a consequence of experience and knowledge – he is nevertheless speaking, for the first time, about development within the individual life span, and signalling the site of that development in the mind. Freud will take up the torch and develop a language through which to address the importance and the effect of the individual span.

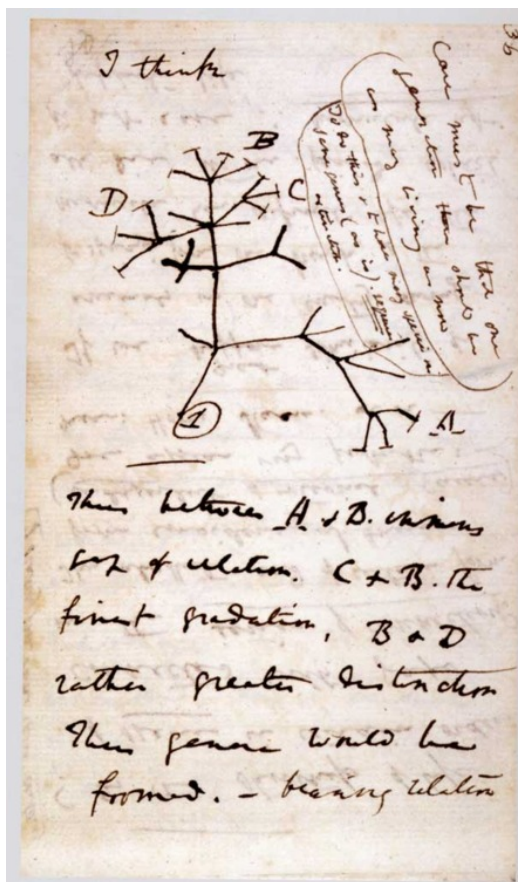
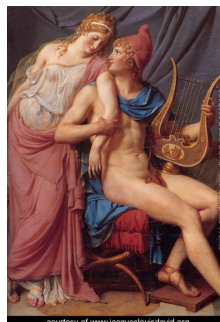


Plate 2. Scanned image of Notebook B, page 36.



Plate 3. Charles and Catherine Darwin, drawn by Ellen Sharples, 1816.



From left to right Top: (Plate 4. The Courtship of Washington, Jean Leon Jerome Ferris, Plate 5. The Courtship of Paris and Helen, Jacques Louis David), Middle: (Plate 6. Girl with Plant, Plate 7. Woman with Plant), Bottom: (Plate 8. Woman at Window with Plant)

Notes

¹ As George Levine, among others (see Rowlinson, “Darwin’s ~~Ideas~~”), has noted: “The peculiar Darwinian wrinkle in the scientific preoccupation with observation is that the observer becomes vulnerable, particularly because – as Darwin extends the rule of science from inorganic to organic phenomena – the observer becomes the observed” (*Novelists* 16).

² In his *Autobiography*, Darwin claims that Notebook M, written in 1838, demonstrates that he “worked on true Baconian principles, and without any theory collected facts on a wholesale scale, more especially with respect to domesticated productions, by printed enquiries, by conversation with skillful breeders and gardeners, and by extensive reading” (83).

³ As Lorraine Daston writes, “objectivity is neither monolithic nor immutable: our current usage is compounded of several meanings – metaphysical, methodological and moral – and each meaning has a distinct history, as well as a history of fusion within what now counts as a single concept of ‘objectivity’” (1992, 597). I use the term to signal the imperative of self-abnegation in the scientific communication of facts. Whereas George Levine, in *Dying to Know*, develops a theory of objectivity in nineteenth-century science centered around self-abnegation taken to the extreme of the renunciation of the self, the attempt to totally efface the self in the communication of scientific truth, I prefer to read the term as a composite of the related goals of 1) humility in the face of nature, 2) the disavowal of underlying assumptions in the observation of the natural world, and 3) disinterestedness in the communication of observations.

⁴ Daston and Galison note in *Objectivity*: “It was Immanuel Kant who dusted off the musty scholastic terminology of “objective” and “subjective” and breathed new life and new meanings into it. But the Kantian meanings were the grandparents, not the twins, of our familiar senses of those words. . . . For Kant, the line between the objective and the subjective generally runs between universal and particular, not between world and mind” (30). Continuing, they write: “Yet it was the reception of Kantian philosophy, often refracted through other traditions, that revamped terminology of the objective and subjective in the early nineteenth century” (30). Daston and Galison point out that Kant’s “objective” refers to “‘forms of sensibility’ (time, space, causality) that are the preconditions to experience” (30). As Coleridge wrote out in the margin of Henrich Steffens’s *Foundations of Philosophical Natural Science*, the Kantian lexicon made its way into scientific vernacular, resulting in the “strange use of Subjective and Objective – his S[ubjectivity] = the O[bjectivity] of former Philosophers” (*Objectivity* 30).

⁵ Daston and Galison offer an excellent analysis of the movement that precedes objectivity, termed “truth-to-nature.” For example, in a scientific atlas a truth-to-nature image would aim to convey “the characteristic, the essential, the universal, the typical.” Truth-to-nature, then, far from surpassing the subjectivity of the scientific observer, is the result of the *observer’s* ability to lift the veil of appearances and detect the ideal form of the object (see Daston and Galison, 2007, note Fig. 1.1. Truth-to-Nature, between pages 19 and 20).

⁶ <http://darwin-online.org.uk/>

⁷ See Chapter Two endnote 13.

⁸ From Ernest Renan's *L'avenir de la science*, pages 234-5-6: "Des monographies sur tous les points de la science, telle devrait être l'oeuvre du XIXe siècle: oeuvre pénible, humble, laborieuse, exigeant le dévouement le plus désintéressé; mais solide, durable, et d'ailleurs immensément relevée par l'élévation du but final. . . . Il faut une vertu scientifique bien profonde pour s'arrêter sur cette pente fatale et s'interdire la précipitation, quand la nature humaine tout entière réclame la solution définitive. Les héros de la science sont ceux qui, capable des vues les plus élevées, on pu se défendre toute pensée philosophique anticipée, et se résigner à n'être que d'humbles monographes, quand tous les instincts de leur nature les eussent portés à voler aux hauts sommets. . . . [Il faut] perdre son âme pour la sauver. *Se résoudre à ignorer, pour que l'avenir sache.* . . . Eh bien! Les monographies sont encore après tout ce qui reste le plus. Un livre de généralités est nécessairement dépassé au bout de dix années; une monographie étant un fait dans la science, une pierre posée dans l'édifice, est en un sens éternelle par ses résultats. On pourra négliger le nom de son auteur; elle-même pourra tomber dans l'oubli; mais les résultats qu'elle a contribué à établir demeurent."

⁹ In their joint study *Objectivity* Daston and Galison write that Huxley "warned that science could provide knowledge only of empirically derived natural laws, not of the ultimate nature of things. Huxley attributed the progress of modern science to an exclusive concentration on "verifiable hypotheses," regarded "not as ideal truths, the real entities of an unintelligible world, behind phenomena, but as a symbolic language, by the aid of which Nature can be interpreted in terms apprehensible to our intellects"" (213). See also pages 214-216 of *Objectivity*, where Daston and Galison note, through a reading

of Huxley, that “meekness and dynamism were supposed somehow to coexist in a single knowing self,” and that “almost every aspect of the mid-nineteenth century scientific persona was driven by this tension between humble passivity and active intervention with respect to nature” (216). As the authors point out, for Huxley, through an act of will the scientist must tread the line between subjectivity and objectivity to become ““nature’s mouthpiece”” (215).

¹⁰ For examples of more and less extreme versions of Renan’s sentiment, see Daston and Galison, *Objectivity*, pages 213-16, on Thomas Huxley, and consider the language of Thomas Carlyle’s *Selbstödung*, outlined in Chapter Three of George Levine’s *Dying to Know*. See also Levine’s work on Descartes in the same volume.

¹¹ For further reading on Whewell’s role in carving out a place for Darwin within the institutions of the scientific community, see *Charles Darwin’s Letters: A Selection 1825-1859*, specifically: letter to Susan April 23rd, 1835 (46), letter to Henslow, October 14th, 1837 (60-2), and letter to Francis Beaufort, June 16th, 1837 (57-8).

¹² It should also be noted that in addition to *On the Origin of Species*, Levine has Darwin’s *Autobiographies* also in mind as he writes about his subject’s great humility, as the *Autobiographies* figures centrally in Levine’s argument about self-effacement and objectivity in science. The *Autobiographies* abound with evidence of Darwin’s self-deprecating manner. For example: “I have no great quickness of apprehension or wit which is so remarkable in some clever men, for instance Huxley,” or, his earlier recollection of himself as a very ordinary schoolboy, “below the common standard in intellect” (85, 10).

¹³ Examples of Darwin's use of "facts" include the following: "necessity of hereafter publishing in detail all the facts" (66); "I could show by a long catalogue of facts" (102); "I could give many facts" (139), etc. See pages 57, 149, 173, 274, and elsewhere.

¹⁴ For a detailed account of Darwin's relationship to Alfred Russell Wallace, see Volume II of Janet Brown's excellent biography, *Charles Darwin: The Power of Place*, pages 14-18.

¹⁵ For examples of "could" and "should" in the *Origin*, see pages 102, 139, 427, and 57.

¹⁶ While Darwin did, in 1868, and in a revised form, in 1875, produce *Variation of Animals and Plants Under Domestication*, and while *Descent of Man, The Expression of Emotion in Man and Animal*, and *Fertilization of Orchids* follow-up on elements of the research he speaks through in the *Origin*, he never publicly accepted that discrete monographs on variation under nature, the tendency of dominant species to vary most, the struggle for existence, or the natural checks inhibiting species' increase, would ever be written. It is also worth noting that Darwin's *Variation of Plants and Animals Under Domestication*, along with the other titles mentioned, is not the catalogue of dry facts he calls for. Indeed, Darwin's speculations on genetics in *Variation*, his discussion of "prepotency," which includes both a very Lamarckian-sounding argument for use and disuse and a counter-argument, is once again a narrative account. Darwin was not disposed to produce catalogues of facts or lists of his experiments. Consequently, it is reasonable to question his motives for maintaining numerous apologies and promises in the *Origin*, and, further, logical to surmise that these apologies and promises are ultimately disingenuous. Darwin's text demonstrates that he felt satisfied to *gesture* to the body of

facts he had gathered, and that he wanted his reader to rely on him as the source of authority.

For more on Darwin's theory of "pre-potency" see Stanley Hyman, *The Tangled Bank*, where writes in note 2 on page 45: "Darwin concludes the book with his own genetic theory, the "provisional hypothesis of Pangenesis," a speculation that invisible "gemmules" thrown off by every cell in the organism combine to make up the sexual elements. No theory of Darwin's was more derided on its appearance, even by many of his friends, but he stuck to it, at least as a possibility. . . . Now, in "The Third Stage in Genetics" in *A Century of Darwin*, Donald Michie not only describes Pangenesis as "an arresting and prophetic hypothesis" that fits some present evidence as germ-line heredity does not, but concludes "I estimate that genetics has about ten years to go before it can claim fully to have caught up with Darwin.""

¹⁷A search of *Darwin Online* (<http://darwin-online.org.uk/>) reveals that the *Origin*'s first edition actually has 315 total; the second edition has 328 total (an increase of 8); the third edition has 215 (100 fewer than the first edition); the fourth edition has 182 total (133 fewer than the first edition); the fifth edition has 114 (201 fewer than the first edition); the sixth edition has 175 (140 fewer than the first edition). The substantive point here is that every subsequent edition contains the 20-odd references to either a future work, or to a catalogue of facts, or to what "could" under other circumstances, have been done by Darwin, relative to fact-giving.

List of citations: "necessity of hereafter publishing all the facts" (2); "a few facts in illustration" (2); "treat this subject . . . too brief . . . long catalogue" (4); "some other

facts” (14); “facts communicated to me” (18); “a long catalogue of dry facts should be given; but these I shall reserve for my future work” (44); “I could show by a long catalogue of facts” (45); “I could give many facts” (94); “I can bring a considerable catalogue of facts” (103); “a long catalogue of facts which cannot here be given” (255); “innumerable other such facts” (29, 349, 479); “facts could be given” (8, 257, 340, 347, 363, 376, 392, 399, 404).

¹⁸ See Beer, *Darwin's Plots*; Levine, *Darwin and the Novelists*; Shuttleworth, *George Eliot and Nineteenth-Century Science*, and also A. Dwight Culler, “The Darwinian Revolution and Literary Form” and Walter F. Cannon, “Darwin's Vision in *On the Origin of Species*,” in *The Art of Victorian Prose*, ed. George Levine.

¹⁹ Darwin devoted months to an experiment that involved floating seeds in seawater to determine whether it was possible for seeds to survive, floating in sea currents, or whether seed dispersal could only credibly be accomplished by birds. For more on this, see Chapter XI, subsection “Means of Dispersal” in the *Origin*. While Darwin's experiments accord with a Baconian scientific method, he is yet required to infer an analogy from the domestic experiment to variation in the wild. Nevertheless, his experiments provide him insight into heredity, modification, and variation in successive generations.

²⁰ See Patricia Ingham, “Hardy and *The Wonders of Geology*,” and Gideon Algernon Mantell, *The Wonders of Geology*.

²¹ see *Macbeth* IV.i.

²² ““Il résulte, de tous les faits que j’ai rappelés, que le sens, l’imagination et la pensée elle-même, si élevée, si abstraite qu’on la suppose, ne peuvent s’exercer sans éveiller un sentiment corrélatif” (13).

²³ The symbols < > represent Darwin’s later deletion of text from the body of the notebook text.

²⁴ The symbols << >> represent Darwin’s later insertion of text into the body of the notebook text.

²⁵ For “keeping steadily in mind,” see for example page 129; for “insuperable to the imagination,” see for example page 435.

²⁶ Darwin’s list of correspondents includes: botanical experts Thomas Hooker and Asa Gray; a long list of breeders throughout Europe; a former servant who, following an immigration to Australia collected barnacles for Darwin; numerous naturalists around the world, from New Zealand and Australia, to South America and many parts of Europe, from whom Darwin received specimens and data, and whom he asked to complete detailed survey questionnaires authored by himself. See Janet Browne, *Charles Darwin: Voyaging* and *Charles Darwin: The Power of Place*.

²⁷ In footnote 2, page 5 of “The Value of Narrativity in the Representation of Reality,” Hayden White includes this etymological map of the word “narrative”: “The words “narrative,” “narration,” “to narrate,” and so on derive via the Latin *gnarus* (“knowing,” “acquainted with,” “expert,” “skilful,” and so forth) and *narroi* (“relate,” “tell”) from the Sanskrit root *gnrd* (“know”). The same root yields γνωριμζ (“knowable,” “known”): see Emile Boisacq, *Dictionnaire étymologique de la langue grecque* (Heidelberg, 1950),

under the entry for this word. My thanks to Ted Morris of Cornell, one of our great etymologists.”

²⁸ See Levine, *Darwin the Writer* (105). For a discussion of visual images in the *Origin* and of “The Great Tree of Life” see Matthew Rowlinson’s “Darwin’s Ideas.”

²⁹ From *OED*’s definition of “metaphor”: From the ancient Greek *μεταφορά* < *μετα-* META- *prefix* + *φορά* carrying (< the *o*-grade of the stem of *φέρειν* to bear, carry: see BEAR *v.*¹), after *μεταφέρειν* to transfer.

³⁰ I refer the reader to the *Darwin Online* version of the 3rd edition of the *Origin*.

<http://darwin-online.org.uk/content/frameset?itemID=F381&viewtype=text&pageseq=1>

³¹ See page 12 of Janet Browne’s *Charles Darwin: Voyaging*.

³² For examples of conventional courtship portraiture, see “The Courtship of Washington” by Jean Leon Gerome Ferris (1758), and “The Courtship of Paris and Helen,” Jacques Louis David (1748-1825).

³³ See “Introduction,” *Voyage of the Beagle*, page 15.

³⁴ For a discussion of the autobiographical search for beginnings, see Edward Said, *Beginnings*, especially Chapter II, “A Meditation on Beginnings,” in which he argues that the claim of an origin is always arbitrary, and that autobiography is intimately linked to fiction though its promise is the detailing of the literal truth.

³⁵ Much criticism of the genre of autobiography reads “causality” in autobiographical narratives as follows: “The crucial idea of development requires a notion of causality, since ‘development implies order, and not accidental change. One state contains within itself the seeds of the next; the second contains the seeds of the third, which were

therefore also implicit in the first; and so on. In other words, development implies causality.’ Until western culture placed great importance upon causality, until it posited a mechanistic or naturalistic universe, it was impossible to explain the uniqueness of an individual human being.” (Landow xix)

³⁶ Darwin’s text defies the norm in autobiography. As Mutlu Konuk Blasing argues, “autobiographical writing fictionalizes life by introducing order and establishing connections or relations between events. In autobiography, then, what was perhaps arbitrary becomes necessary.” Furthermore, representation or the “telling of events” inevitably fictionalizes, because “narratives have beginnings and ends. . . . It is in narrative that things ‘happen.’” (Landow xxxiv)

³⁷ Darwin’s letters are full of descriptions of his physical complaints, of the many water, or hydropathy, treatments he sought, and of his frequent fears that he would not live long enough to complete his great species book. See *Charles Darwin’s Letters: A Selection, 1825-1859*, Ed. Frederick Burkhardt.

CHAPTER THREE

FREUD'S GEO-PSYCHIC EXCAVATIONS IN *THE INTERPRETATION OF DREAMS*

The air thin and pure, danger near and the
 spirit full of cheerful spite: these fit well together.
 I want hobgoblins around me, for I am courageous.
 Courage that scares away phantoms makes
 hobgoblins for itself – courage wants to laugh. (67)¹

F. Nietzsche

Some possible dream, long coiled in the ammonite's slumber
 Is uncurling. (120)

W.H. Auden

I.

In the 1927 Postscript to his essay on lay analysis, Sigmund Freud writes “In my youth I felt an overpowering need to understand something of the riddles of the world in which we live and perhaps even to contribute something to their solution” (*SE* 20:253). Freud’s “overpowering need” leads him to develop a new branch of science, the “substructure and perhaps even [the] very foundation” of psychology, whose purpose is to detect unconscious mentation² and to bring to light the hidden reasons behind pathological thought and its embodiments (*SE* 20:252). Although he would stage psychoanalysis as science, as so often in his writing, Freud here positions the analyst as a figure well-suited to a literary *milieu*, a sort of detective – one urged to discover that which is artfully concealed.³ A riddle is a mystery, a puzzle that obfuscates its own

meaning, and which in its very existence would seem to necessitate an ingenious adversary (the analyst) to make sense of its apparent paradoxes. Looking back on his life as he nears the end of his career, Freud conceives of the work of psychoanalysis as a search within a manifest domain (“the world”), where hidden, concealed, or indistinct truths have the density of material forms, as they lie behind the riddles that obscure them.

To parse the “riddles of the world” Freud establishes, throughout his oeuvre, recurring motifs that materialize the ephemeral territories he seeks to map. In *The Interpretation of Dreams*, the text central to this chapter, Freud spatializes the realm of the unconscious variously as a “road,” a “path,” a “dark wood,” a “cavernous defile,” and the discoveries made there as “ruins,” a “tangle,” “loop-lines or short-circuits,” “layered” matter, and “remnants.”⁴ The unconscious is a place, divided by roads, subdivided by paths, with enclosures and depths. It is punctuated with the detritus of time passing: ruins signal buildings long-since disused; tangles are the aftermath of budding life; short-circuits follow behind pulsing energy, etc. When Freud triumphantly writes near the end of his opus that “the interpretation of dreams is the royal road to a knowledge of the unconscious activities of the mind,” he is insisting upon a specific pictorial delineation of the mind, one that is spatio-temporally demarcated (*IOD* 647).⁵ A road suggests a place and a traveller, perhaps an explorer or a detective (for indeed, an explorer is a kind of detective)⁶, and a journey, which in turn suggests an expanse of time. This chapter will explore the spatio-temporal dimension of Freud’s unconscious in *The Interpretation of Dreams*, as well as the relationship of Freud’s insistence on this model to his attendant insistence that psychoanalysis be regarded as a science. I will suggest that in working to materialize the ephemeral (and dreams, those fleeting nighttime scenes, are perhaps the

most diaphanous of our thought-productions), Freud attempts to build a body of concrete evidence upon which to base an experiential scientific method.

In *The Language of Psychoanalysis* J. Laplanche and J.B. Pontalis define “metapsychology” as first the branch of psychology founded by Freud, and second as “an ensemble of conceptual models which are more or less far-removed from empirical reality,” urging that these conceptual models (which include the ‘topographical’) be treated as metaphors (251, 449). And yet, as with the scientific theories of Charles Lyell and Charles Darwin, Freud’s contribution to the science of psychology is built with and out of figurative language. That is to say that figurative language, rather than adding another layer of ephemera to a description of psychical processes, actually both territorializes the psyche and brings metapsychology into being. As Freud remarks in *The Interpretation of Dreams*, “we have been obliged to build our way out into the dark” (588). Without the forward reach of figurative language, which allows the scientist to grasp in excess of his own experience or knowledge – to step out, as it were, from steady to uncertain footing – there would be no psychoanalysis. And indeed, in a letter to Wilhelm Fleiss from 1898, contemplating the term “metapsychology” as “the name . . . for my psychology that leads behind consciousness,” Freud is at once insisting upon the psyche as a region and fearlessly asserting the validity of a metaphorical spatial trope for its description (*SE* 1:274). In *Beyond the Pleasure Principle*, and referring to his account of the “death drive,” Freud writes that

We need not feel greatly disturbed in judging our speculation upon the life and death instincts by the fact that so many bewildering and obscure processes occur in it—such as one instinct *being driven* out by another or

an instinct *turning from* the ego to an object, and so on. This is merely due to our being obliged to operate with the *scientific terms*, that is to say with *the figurative language*, peculiar to psychology (or, more precisely, to depth psychology). (*SE* 18:60; emphasis added)⁷

For Freud, scientific language is synonymous with figurative language. Like figurative language, science is exploratory, leading one into unmapped regions with the goal of charting the indefinite. In Freud's science, something as abstract as instinct can be thought of as having sufficient density to 'turn' or be 'driven'. I will suggest that Freud's insistence upon a material realm serves a positivist function in building the processes of the mind into observable phenomena. That Freud believes the object of his inquiry can be measured experientially is evidenced by his encyclopedic entry for "Psycho-Analysis," composed two years after the publication of *Beyond the Pleasure Principle*, which is concluded with the subsection "*Psycho-Analysis an Empirical Science*," in which he writes:

Psycho-analysis is not, like philosophies, a system starting out from a few sharply defined basic concepts, seeking to grasp the whole universe with the help of these and, once it is completed, having no room for fresh discoveries or better understanding. On the contrary, it keeps *close to the facts in its field of study, seeks to solve the immediate problems of observation, gropes its way forward by the help of experience, is always incomplete and always ready to correct or modify its theories*. There is no incongruity (any more than in the case of physics or chemistry) if its most general concepts lack clarity and if its postulates are provisional; it leaves

their more precise definition to the results of future work. (*SE* 18: 253-4; emphasis added)⁸

With over thirty years of practice behind him, Freud declares that the postulates of psychoanalysis are not speculations but facts, which is to say firm conclusions arrived at inductively by systematic observation, measurement, and verification, for the production of scientific hypotheses. This chapter, then, will stage an inquiry into Freud's body of evidence in order to detect the connective tissues between his empiricism and that of Lyell and Darwin. If the latter experienced their subject through the connective propensities of the mind, then Freud sought to first materialize then systematize those very connective propensities, and in doing so championed the species of empiricism so crucial to nineteenth-century science, whose subject so often was not there and could never be seen.⁹

As Suzanne Raitt has shown, Freud's career was dotted with the anxious question of whether psychoanalysis was qualified to assume the title of science. The first sentence of Freud's Introduction to the "Project for a Scientific Psychology" (1895) states that "the intention is to furnish a psychology that shall be a natural science: that is, to represent psychical processes as quantitatively determinate states of specifiable material particles" (*SE* 1:295). Freud eventually admits defeat in the ambition to chart the biochemical processes of thought, saying with chagrin in 1915 that though

research has given irrefutable proof that mental activity is bound up with the function of the brain. . . . every attempt to go on from there to discover a localization of mental processes, every endeavour to think of ideas as

stored up in nerve-cells and of excitations as travelling along nerve-fibres, has miscarried completely. (*SE* 14:174)¹⁰

And yet, in his essay on lay analysis, Freud defiantly folds psychoanalysis into the category of science, saying that “as a ‘depth-psychology’, a theory of the mental unconscious, it can become indispensable to all the sciences which are concerned with the evolution of human civilization and its major institutions such as art, religion and the social order” (*SE* 20:248). As a branch of the “mental sciences” of psychology, which itself “is a natural science,” Freud baldly insists that psychoanalysis too be acknowledged as a natural science (*SE* 20:248, 23:282).¹¹ As if to throw up his hands in exasperation, he exclaims: “What else can it be?” (*SE* 23:282). And yet, long before admitting defeat in the charting of the mind’s “material particles” to “discover a localization of mental processes,” he writes in *The Interpretation of Dreams* (1900) that an object of psychoanalytic work is to de-anatomize the mind. Freud insists upon psychoanalysis’s status as a science, and yet refuses to proceed strictly empirically – which would entail acknowledging the mind’s anatomical status – instead attempting to use non-empirical topographical figurations of the mind to establish the scientific validity of his endeavour. In chapter seven of the dream book, Freud writes:

What is presented to us in these words [*the scene of action of dreams is different from that of waking ideational life*] is the idea of *psychical locality*. I shall entirely disregard the fact that the mental apparatus with which we are here concerned is also known to us in the form of an anatomical preparation, and I shall carefully avoid the temptation to

determine psychological locality in any anatomical fashion. I shall remain upon psychological ground. (*IOD* 574)

This “psychological ground” is not the grey matter inside our skulls, and the phrase “*psychical locality*” is a defiant eschewing of those “material particles” confined within the folds of the brain. Almost from the beginning, Freud is committed to a natural science whose primary task is to draw up a topography of thought. Thought has a “scene,” a “locality,” and a grounding. So too, then, does the systematic inquiry into its forms and effects. Psychoanalysis as a science occupies that particularly nineteenth-century condition of intrepid invention. Writing at a time where the word “science” – in its particularized modern sense, as the study of the natural and physical world – had only resided in the popular consciousness for sixty-odd years, having previously denoted, much more broadly, the “state or fact of knowing,” it is not surprising that Freud should treat “science” as a protean entity, variable in its form.¹² Freud’s science will insist on an observable subject, but with the caveat that the psyche be taken as separate from its anatomical materiality. Psychoanalysis insists that the psyche has density. In *The Interpretation of Dreams*, Freud writes “we will picture the mental apparatus as a compound instrument...[whose] ‘systems’ . . . stand in a regular spatial relation to one another” and that “in a given psychical process the excitation passes through the systems in a particular *temporal* sequence” (575). We cannot, then, dismiss the ‘roads’, ‘paths’, ‘defiles’, ‘ruins’, and ‘remains’ of the unconscious as mere vehicles for Freud’s idea of mentation. The language Freud uses to describe the work of interpreting psychic phenomena, which insists on spatializing and temporalizing, coincides with the syntax of

his scientific project. The spatio-temporal vernacular of Freud's writing serves a purpose, and it will be the task of this chapter to identify what that purpose might be.

II.

In explaining the work of yielding psychic impulses to measurement, Freud transcribes mentation in the language of action, and lends to the act of detecting psychological processes the language of exploration. Freud's dream world is virtually *peopled* with the various psychic functions that control dream output. In *The Interpretation of Dreams* we are told that the dream work 'reverses', 'distorts', 'parodies', and even 'destroys' the dream thoughts, that the censor 'dissimulates', that condensation 'fragments', and that memory 'mutilates'.¹³ In the drama of the dream there are many actors, and in the broader theatre of the interpretation of psychic processes there is a hero. For a case in point, we turn our attention to "The Aetiology of Hysteria," which Freud wrote in 1896, three years before completing *The Interpretation of Dreams*. From Lord Byron's Childe Harold, Mary Shelley's Robert Walton, and Alfred, Lord Tennyson's Ulysses to Charles Darwin's *Voyage of the Beagle*, the nineteenth century saw the explorer fixed in the public imagination as a great heroic figure of the age. In "The Aetiology of Hysteria" Freud takes up this action hero as the figure best suited to analogize the work of the analyst. He writes:

Imagine that an explorer arrives in a little-known region where his interest is aroused by an expanse of ruins, with remains of walls, fragments of

columns, and tablets with half-effaced and unreadable inscriptions. (*SE* 3: 192)

The destination is immediately established as a place both remote from public (conscious) knowledge and belonging to the distant past. Knowing Freud's fascination with Italy, one imagines an untrodden region of eighteenth-century Pompeii or some other pristine site of that sort, which might "arouse" his interest.¹⁴ That the explorer is captivated by the pristine monument to an eroded past is significant. The analyst-explorer, like Sir Arthur Conan Doyle's detective Sherlock Holmes, must have his curiosity piqued by the riddle before him. He does not explore for the sake of exploring. Like all seekers, he is moved by what stimulates him. The expanse he finds is made up of structural remains and "half-effaced," "unreadable" text. In being so singled out, language occupies equal status in the picture of this monument to the past. As in the 1893 "Preliminary Communication" in *Studies on Hysteria*, language here bears witness – as much as the degraded walls and mosaics and columns of a former structure – to the scenes which the site commemorates (*SE* 2:8). That the inscriptions upon the tablets are obscured and incomprehensible operates as yet another motivating force for our explorer. The site is a riddle and within it, inscribed on a stone that could serve as a material notation or an echo of the larger monument, is a rebus. The ruins are a puzzle and within the puzzle is a cryptic word-riddle. Freud continues:

He may content himself with inspecting what lies exposed to view, with questioning the inhabitants—perhaps semi-barbaric people—who live in the vicinity, about what tradition tells them of the history and meaning of

these archaeological remains, and with noting down what they tell him—
and he may then proceed on his own journey. (*SE* 3:192)

Here the explorer most explicitly assumes the character of a detective. He may examine the ruin with a view to uncovering its condition or character; he may interview the locals to gain their origin stories and interpretations. This inclusion of the uncivilized human speaks to the tacit assumption that the analyst-explorer, a “forensic physician,” will invariably discover some iteration of the patient’s waking existence represented in the unconscious, thereby enabling him to extrapolate the facts behind the scene under investigation (*SE* 3:192). Freud puts it well on the first page of *The Interpretation of Dreams*, where he writes that “every dream reveals itself as a psychical structure which has a meaning and which can be inserted at an assignable point in the mental activities of waking life” (35). Tracing the aetiology of hysteria is much like realizing the analysand’s latent dream thoughts. What is required is the ability to communicate with the structures, codes, and people dwelling in the remotest regions of the mind.

But he may act differently. He may have brought picks, shovels and spades with him, and he may set the inhabitants to work with these implements. Together with them he may start upon the ruins, clear away the rubbish, and, beginning from the visible remains, uncover what is buried. (*SE* 3:192)

The explorer’s unpredictability is a strength. Adaptable in his process, the explorer demonstrates in a small way the analyst’s arsenal of approaches. The reader is being educated in the complexity of psychoanalysis, where the analyst encountering an artifact of the analysand’s past may take note and “then proceed on his journey,” or “he may act

differently.” In addition to an explorer and a detective, the analyst may be an archeologist. Freud supplements the trope of detective-explorer with that of archaeological investigator in the quest to see the site yield its hidden meaning. This investigator has yet a more specialized expertise in ancient history and comes equipped with a methodology through which to offer a systematic description to support his explanation of whatever the “picks, shovels and spades” unearth. Unsatisfied with the role of amanuensis to the uncivilized locals, the explorer enlists them as native informants, whose reconstruction of the monument to the analysand’s secret history will provide the explorer with insight into the possible dimensions of both the original structures of the ruin and the missing characters with which to parse the tablet’s message. Beginning from the “visible remains,” that which is subterranean may thus be brought up to the light. In *The Interpretation of Dreams*, Freud cites a felicitous passage from Ludwig Strümpell’s 1877 *The Nature and Origin of Dreams*, in which he comments that “dreams sometimes bring to light, as it were, from beneath the deepest piles of débris under which the earliest experiences of youth are buried in later times, pictures of particular localities, things or people, completely intact and with all their original freshness” (49). The trope of ‘bringing to light’ recurs throughout the dream book, and indeed the opposition of conscious thought as light to unconscious thought as obscurity variously defined is one of the guiding symbolic motifs of Freud’s writing on the work of analysis. In clearing away the “rubbish,” the extraneous or misleading information that the mind manifests to conceal its secrets, the investigation of analysis may shed light on the relation of repressed thoughts (or the sleeping mind) and conscious thoughts (or the waking state).

If his work is crowned with success, the discoveries are self-explanatory: the ruined walls are part of the ramparts of a palace or a treasure-house; the fragments of columns can be filled out into a temple; the numerous inscriptions, which, by good luck, may be bilingual, reveal an alphabet and a language, and, when they have been deciphered and translated, yield undreamed-of information about the events of the remote past, to commemorate which the monuments were built. *Saxa loquuntur!* (*SE* 3:192)

Victory takes the form of following the psychical course from symptom (ruin) to the event of the trauma (the building point), or from wreckage to structure. As if watching the progress of a bay leaf from bud to vine to laurel crown, analysis is staged as the observation, albeit retrospectively, of the growth of the symptom as it takes hold in the analysand's mind. From ruin to rampart, analysis (the work of detection, exploration, and excavation together) fills out from fragments the coherent monument to the trauma's originary moment. Having laid bare the parameters of the site, the stories of its inhabitants, and even that which lay yet beneath or behind what was apparent in this remotest outskirts of the mind, "discoveries are self-explanatory." The "remains of walls, fragments of columns, and tablets with half-effaced and unreadable inscriptions" will confess the secrets of their construction and the forces that brought about their erosion and degradation. In his 1971 account of the famous analysis he underwent with Freud, Sergius Pankejeff (a.k.a The Wolf Man) confirms the importance of this analogical model in noting that Freud told him that "the psychoanalyst, like the archeologist in his

excavations, must uncover layer after layer of the patient's psyche, before coming to the deepest, most valuable treasures" (139).

Although the therapeutic procedure delineated here is written with the hysteric in mind, its exploration of the buried remains of traumatic scenes is well-suited to the work of unearthing latent dream thoughts from the compressed, fragmented, deceptive, and censored manifest content of dreams. In the analysis of hysterics, Freud writes,

we try . . . to induce the symptoms of a hysteria to make themselves heard as witnesses to the history of the origin of the illness, [and in order to do so,] we must take our start from Josef Beuer's momentous discovery: *the symptoms of hysteria . . . are determined by certain experiences of the patient's which have operated in a traumatic fashion and which are being reproduced in his psychological life in the form of mnemonic symbols.*" (SE 3:192)

In both *The Interpretation of Dreams* and *Studies on Hysteria* Freud enlists language as a witness. As Jed Rasula and Steve McCaffery point out, for Freud "it is Language that speaks," to which I would add that here, it is language that *witnesses* (445). If there is a density to the mental structures and systems of the mind, and Freud's analogy of the explorer insists that in order to comprehend it we must landscape the psyche with monumental language, then its various rebus representations, which strip language of its syntactical coherence, leaving behind symbolic arrangements that defy understanding, must themselves be taken as matter in the psychic environment: words matter.

At the end of his extraordinary analogy, Freud exclaims "*Saxa loquuntur!*":
Stones speak! The final word is lithic, and it reaches back to the beginning of his analogy

to remind us of the materiality of the ruins and partial tablets. The list of investigative approaches is here lengthened to include the geologist, whose work as lithic interpreter is tacitly joined to the analyst's task of devising systems to understand both extant remains and ongoing events largely invisible to the naked eye. Stones speak, and they tell us of the medusa-effect of trauma, in which our mind petrifies our past, making monuments out of events and then burying them in the earth of our unconscious.

Just as the ruins “commemorate” the analyst's trauma or memory, so the stones of the waking world call to the remembrance of those who investigate them remote terrestrial memories. Or so Lyell's formula for ‘restoring in imagination’ would suggest. Of the edifices revealed by the work of analysis, Freud includes among the key structures of an ancient civilization – in addition to the “ramparts,” “temple” and “tablets” – a bank: the “treasure-house.” This edifice serves as a recapitulation of the ruin as a whole, hording as it does untold treasures in its coffers. Thus the ruin contains its own analogic formula, where unlocking the door to the treasure-house stands in for the analyst reconstructing from a ruin a coherent scene. For all its erosions, which distort, censor, and fragment its original structure, Freud suggests, the ruin wants its secrets brought to light, so much so that it contains a repository, a storage space, within its own framework.

As we have seen, Lyell looks upon the natural world as a kind of treasure chest, one whose lid might be opened to reveal an ancient and ever-growing collection. In his *Principles* the past is preserved (‘commemorated’) – never out of the reach of memory – and a seeker may decipher its narrative if he enlists the special combined effort of “the reason and the imagination” to “restore” scenes of the past (I:81, 159). Unflinching scrutiny of strata and the processes of upheaval and subsidence operating all around him

lends the lithic investigator long-sightedness into the yawning past and keys him into its story. For the explorer/detective/archeologist in Freud's analogy, there are numerous voices competing to "speak" the story of the past: the "semi-barbaric" inhabitants, the "tablets," "the numerous inscriptions," and the very stones that make up the psychic topography. Like Lyell's cast of secondary characters – the amphibian, Umbriel, and the Gnome – each of these figures constitutes a witness whose testimony, if taken by an ingenious interpreter, promises to unlock and project scenes unknown to the seeker. Whereas Lyell relies on sentient figures in his fantasy of seeing underground, Freud establishes a far more slippery set of witnesses, who have each 'seen' or experienced the past in widely different ways. And yet, the "semi-barbaric" inhabitants and the "inscriptions" serve the same purpose as Lyell's privileged witnesses, in materializing the work of the seeker's imagination as he scrutinizes what cannot be seen.

To forward the fluency of his imaginative capacity, Lyell introduces the amphibian, a creature who moves fluidly between widely diverging states of existence, effortlessly exchanging the aquatic for the terrestrial. The amphibian *embodies* fluency for Lyell and stands in his text as a symbol for the work of joining together apparently disparate elements into a single coherent trajectory. For Freud, this work requires several separate analogic ideas, but culminates in his surprising declaration that "by good luck" the temple's inscriptions along with those on the tablets "may be bilingual," revealing "an alphabet and a language." The bilingualism of the inscriptions has nothing to do with luck. At the beginning of his analogy, he clearly states that the inscriptions on the tablets are "unreadable." It is only through the slow and tedious work of reconstruction, the combined effort of exploration, detection, and excavation, that the ruins' historical texts

can be translated. This false modesty on Freud's part itself enacts a burial, significantly repressing the centrality of words to the work of psychoanalytic interpretation. Rebus-like in its cryptic representation of the originary scene of trauma in the analysand's living memory, the ruin also contains within itself apparently inscrutable arrangements of symbols and letters in the form of the tablets and inscriptions. And it is only by interviewing the locals and setting them to work with "picks, shovels and spades" thus clearing away the "rubbish, and, beginning from what is visible," uncovering "what is buried" that the multifaceted investigator begins to piece together the fragments. The analyst's reward for his investigation is precisely the decoding of the site's *alphabet* and *language*, which "when they have been deciphered and translated, yield undreamed-of information about the events of the remote past, to commemorate which the monuments were built." The ruins' structures are secondary to its narrative, they merely commemorate, but the language, once understood, yields "undreamed-of information." The captivating excitement with which Freud describes the acquisition of the site's narrative confirms the primacy of unearthing its concealed grammar.

Freud's work here, to decipher the "alphabet," and from there, the "language" of the unconscious, is reminiscent of the Egyptologist Jean-François Champollion's work to decode the Rosetta Stone. If, for Lyell, Champollion's decrypting of hieroglyphics stands-in broadly for the interpretive work of the naturalist undertaking the task of deciphering from the familiar processes of erosion, sedimentation, eruption, and subsidence the earth's hidden systems, then for Freud he is yet a more looming predecessor, since their tasks share the burden of inventing means for translating a totally alien text into a familiar one. Both Champollion and Freud begin with something

unreadable – for one, the Rosetta Stone, and for the other, the topography of the unconscious – and if we take Freud’s analogy of the explorer as definitive of the analyst’s interpretive work, then both find the means for translating their subject by inductively recovering that which is lost to human knowledge. Like Freud’s, Champollion’s archive is largely lithic.

The Philae obelisk, transferred from the island of Philae on what is now Lake Nasser, Egypt to Dorset, England in 1821 for the traveller and collector William Bankes, stands as the key to Champollion’s decoding of the hieroglyphic writing system because it bears two languages. Inscribed with both hieroglyphic symbols and Greek script, the Philae obelisk, though not perfectly bilingual, offers up in Greek letters, which are carved into its base, the two names King Ptolemy V and Cleopatra, and along its column, and within a long series of inscriptions, two long sets of characters each enclosed in a cartouche, one of which is nearly identical to one found on the Rosetta Stone (Robinson 135). Reasoning that hieroglyphic symbols enclosed in a cartouche designate a proper name, and identifying the inscription on the Rosetta Stone as the name of King Ptolemy V, Champollion inaugurates the work of establishing the hieroglyphic writing system.¹⁵ The conclusion of Freud’s analogy could have been written for the Philae obelisk, whose numerous inscriptions *were* “bilingual,” or nearly so, and *did* reveal an “alphabet and a language,” and, through Champollion’s years of interpretive labour, did in fact “yield undreamed-of information about the events of the remote past, to commemorate which the monuments were built.” Indeed, in his 1910 essay “Leonardo Da Vinci and a Memory of his Childhood,” Freud not only recalls that “the first man who succeeded in reading hieroglyphics was François Champollion,” but also notes that “in the hieroglyphics of the

ancient Egyptians the mother is represented by a picture of a vulture,” and speculates that the “goddess’s name [being] pronounced *Mut*,” might etymologically be tied to “the sound of our word *Mutter* [‘mother’]” (*SE* 11:88). Here, as in the dream book, Freud defends the concrete over the conceptual. That the pictorial vulture represents a concrete verbal form stands in for Freud’s task of “finding appropriate verbal transformations for the individual thoughts” in dreams as in hysterical symptoms (*IOD* 375). In his *Précis du système hiéroglyphique des anciens Égyptiens*, published in 1824, Champollion writes:

Hieroglyphic writing, hitherto regarded as formed purely of signs that represent ideas and not sounds or pronunciations, was, on the contrary, formed of signs of which the vast majority express the sounds of words in the spoken Egyptian language, that is to say phonetic characters.

(Robinson 15)

Had this passage about discoveries made in the process of transliterating the Rosetta Stone ended with “*Saxa loquuntur!*” it could not more nicely have anticipated Freud’s declaration in “The Aetiology of Hysteria.” Champollion’s paradigm-altering work announced to the world that stones speak, and was followed, not long afterwards, by Lyell’s *Principles*, which joined in the discussion to delineate a lithic grammar. In the comparison of this passage from Champollion’s great work to Freud’s analogy for the labour of psychoanalysis, hieroglyphic writing understood as pictorial representations of concepts stands in for the tendency of the unconscious to represent thought with visual images, and the discovery that hieroglyphs possess a phonetic value – that a bird might represent the phonetic sound value of *a* – resonates with Freud’s theory, which he most elaborated in his dream book, that the visual images of our unconscious are the result of

our mind selecting the best pictorial representation of a verbal form.¹⁶ In *The Interpretation of Dreams*, Freud writes that “a thing that is pictorial is, from the point of view of a dream, a thing that is *capable of being represented*” (374). For Freud, as for Champollion, the discovery is that rather than abstracting the concept, the pictorial possesses a concrete verbal value.

III.

For Freud it is the extent to which we can incite the images of our unconscious to speak that lends them their value. How that is to be done often defies description. As in Darwin’s theory of evolution by natural selection, and Lyell’s theory of uniformitarianism, the figurative language particular to psychoanalysis performs more than a descriptive function. The language of Freud’s dream book, to which we turn our full attention now, both foregrounds the paramount importance of the *word* for psychoanalytic investigation, and manifests the phenomenon of analysis itself, where one lexical formulation brings about the next, and the next. The reader seems to see Freud arriving at his conclusions by virtue of building verbally toward them, and the book itself seems to mirror the process of analysis. Indeed, as noted above, Freud admits to this, saying that “we can console ourselves with the thought that we have been obliged to build our way out into the dark” (588). Alexander Welsh takes a hard line on this issue, writing that “Freud was pretty much improvising as he went along,” but adding in a conciliatory tone that “rhetorically this was not necessarily a mistake, since Freud appears to share with his readers the uncertainty of discovery” (6). For example, in

Chapter 6, Freud writes “I have asserted above . . . that dreams have no means of expressing the relation of a contradiction, a contrary or a ‘no.’ I shall now proceed to give a first denial of this assertion,” and later, “Thus the ‘not being able to do something’ in this dream was a way of expressing a contradiction—a ‘no’—so that my earlier statement . . . that dreams cannot express a ‘no’ requires correction” (*IOD* 360, 372). Rather than revising the earlier assertion, Freud elects to weave corrections and contradictions together, making the text witness to his gradual acquisition of knowledge in the process of exploration, and employing the empirical method of testing and modifying a given hypothesis.

The question of how images are incited to speak, and when that is accomplished, how their lexicon proliferates, is sketched by Freud at the outset of his sixth chapter, on “The Dream Work.” Keeping in mind that early in the dream book Freud notes that “dreams . . . think predominantly in visual images,” we turn to a rebus invented by Freud to analogize the “task . . . of investigating the relations between the manifest content [present in the dream] and the latent dream-thoughts [inciting the dream], and of tracing out the processes by which the latter have been changed into the former” (*IOD* 311). He writes:

Suppose I have a picture-puzzle, a rebus, in front of me. It depicts a house with a boat on its roof, *a single letter of the alphabet*, the figure of a running man whose head has been conjured away, and so on. Now I might be misled into raising objections and declaring that the picture as a whole and its component parts are nonsensical. A boat has no business to be on the roof of a house, and a headless man cannot run. Moreover, the man is

bigger than the house; and if the whole picture is intended to represent a landscape, letters of the alphabet are out of place in it since such objects do not occur in nature. (*IOD* 312)

Like a dream, the rebus is initially a cryptic pictorial assemblage. And as with Freud's concept of the dream, the rebus is designed to be translated into a word or a phrase, making it a perfect stand-in for a dream. Of previous attempts at dream analysis, Freud writes that all have been misled in their approach by their attempt to "solve the problem of dreams" by dealing "directly with their *manifest* content as it is presented in our memory" of the dream rather than teasing out the causal chain between our lived experience and our nighttime scenes (*IOD* 311). Here, the "picture-puzzle" stands in for the dream's "manifest content," which is to say, the scenes and images remembered upon waking. The headless man, the misplaced boat, and the house are all the result of the various mechanisms of dreaming: condensation, displacement, and censorship. Freud calls these the "dream-work." Condensation is responsible for making dreams "brief, meagre and laconic in comparison with the range and wealth of dream-thoughts;" displacement sees figures or ideas "concealed behind" the dream image or object; and the censor 'omits' or places 'limits' upon what may be included in the dream content (*IOD* 313, 326, 526).

Finally, the rebus includes "a single letter of the alphabet," which, Freud says, seems "out of place" since "such objects do not occur in nature." In a rebus, a letter might provide a hint of the word or phrase which the whole assemblage symbolizes. In that sense, a floating letter *A*, for instance, is perfectly in keeping with the order of 'picture-puzzles'. Why, then, does Freud dwell particularly on the absurdity of this lone letter in a

landscape of headless people and boats moored aloft on houses, neither of which generally “occur” in nature? And why, when we are to understand that the rebus stands in for the compressed transcript of dream thoughts which lives on in our memory, should we expect a coherent and logical “landscape” in the rebus’ tableau? Freud’s emphasis here works to draw attention to the paramount importance of language to dream interpretation. The centrality of language to dream analysis is both a guiding principle of Freud’s dream book and an idea which Freud takes largely as a given: the fact that it is language that materializes the ephemera of our thought processes is everywhere implied but never, strictly speaking, declared. Thus, this indirect meditation on the incongruity of a letter in the landscape of his imagined puzzle can stand in for the numerous instances in *The Interpretation of Dreams* where Freud resists attending directly to the function of language in his process while at the same time dwelling upon the importance of linguistic material to psychoanalysis. Most notably, Freud variously draws attention to the important part played by dream wording, that is, the “dream text” as it is presented by the analysand to the analyst, and by puns and other verbal structures in the communication of dreams.¹⁷ He continues:

But obviously we can only form a proper judgment of the rebus if we put aside criticisms such as these of the whole composition and its parts...[and instead] try to replace each separate element by a syllable or a word that can be represented by that element in some other way. The words which are put together in this way are *no longer nonsensical but may form a poetical phrase* of the greatest beauty and significance. A dream is a picture-puzzle of this sort and our predecessors in the field of dream-

interpretation have made the mistake of treating the rebus as a pictorial composition: and as such it has seemed to them nonsensical and worthless.

(*ID* 312; emphasis added)

In the second part of the passage, Freud adheres more closely to the actual function of a rebus: to conceal a word or a phrase behind the symbolic arrangement of pictures and letters. From a nonsensical tableau, which, to a modern reader, evokes Surrealism or Dadaism in its apparent repudiation of logic and reason, Freud translates his findings into poetry. And yet, no reader of poetry would agree that a poem of lasting value discloses its meaning transparently. Like dreams, poems are the condensation of complex thought, and the language of poetry is chosen for its prismatic value: faceted words allow for allusion, and for the inversion of expected meaning through the many possible derivatives of a word's etymological history. And a line of poetry is the product of countless authorial choices, from meter to metaphor. So the transformation of the rebus (headless running man + boat moored atop a house + floating letter of the alphabet) into a "poetical phrase of the greatest beauty and significance" cannot possibly be taken as a translation, or, indeed, as an interpretation, since the end result itself demands the labour of analysis. Instead of revealing the relation between the manifest and latent content of the rebus/dream, Freud's example dwells on the form the puzzle's answer must take: the word or the phrase.

Through the "poetical phrase" Freud further extends the analogy, substituting the implied author of the line of poetry revealed by the rebus for the mechanisms of dreaming (condensation, displacement, and censorship, among others). Rather than systematically bringing the reader closer to understanding the disentangling work of

interpretation, Freud fixates upon the fact that it is language, even in its abstracted form, as a “poetical phrase of the greatest beauty and significance,” that recovers the evidence of dream activity by converting it to words, phrasings, and a narrative. Instead of a methodology of the interpretive process, Freud, perhaps unintentionally, underscores the centrality of the dream-text to analysis. The “poetical phrase” stands in for the dreamer’s description of the dream, which in turn *becomes* the dream for the purposes of psychoanalytic interpretation. The raw material of the dream event (headless running man + boat moored atop a house + floating letter of the alphabet) is supplanted in analysis by its narration, the dream-text, whose verbal structure (puns, inversions, conjunctions, and jokes) are lent sufficient materiality in analysis to allow the analyst to riffle through the infrastructure of the analysand’s unconscious thought. As Freud writes, “the whole domain of verbal wit is put at the disposal of the dream-work” (*IOD* 376). In “finding appropriate verbal transformations for the individual thoughts,” the dream-text is treated as a spatio-temporal road-map to both the monoliths which the mind builds to stand in for experiences and the fault lines reaching from those monuments into the dreamer’s past (*IOD* 375).

The “dream-text” is so fundamental to Freud’s analytic work in dream interpretation (standing in, as it does, for the manifestation of diseased thought in both the somatic and psychic symptom and, more broadly, for the neurosis itself, in cases of hysteria) that it seems to be taken for granted and to exceed direct definition. Drawing out the correlation between dreams and psycho-pathologies, Freud writes that

a dream can be inserted into the psychical chain that has to be traced backward into the memory from a pathological idea. It was then only a

short step to treating the dream itself as a symptom and to applying to dreams the method of interpretation that had been worked out for symptoms. (*IOD* 133)

In order for the dream to function as a symptom, there must first be a manifestation upon which to turn the observing gaze. Thus the experienced dream must first be transformed into a structure, the verbal dream report. The dream report builds the ephemera of the dream into a *something*. Through the report, the dream undergoes a coming into form. And from the gossamer threads of the experienced dream is woven a dense text whose verbal forms are each freighted with their own complex relation to the dreamer's history, each thread circuitously reaching back into the dreamer's past. Indeed, as Patricia A. Kilroe and Winifred Nöth point out, the etymology of the word *text* reveals it as "something woven," as the past participle stem of the Latin verb *texere*, 'to weave' (126, 332). While some dreams are literally, in Freud's terminology, a "verbal hotchpotch," a linguistic conceit resulting from the compression of several separate thoughts – like Freud's dream-sentence "*It's written in a positively norekdal style,*" where the nonce word turns out to be a "parody" of "*kolossal*" and "*pyramidal*" – most dreams are not experienced as language, but rather record the transformation of thought into visual images (*IOD* 331). In nonce-word dreams, "words are treated . . . as though they were concrete things" just as the visual images in ordinary dreams suggest a spatio-temporal dimension (*IOD* 330). And so, in a sense, both nonce-word dreams and the more typical dreams that combine scenes and bits of conversation are staged pictorially as tableaux. But dreams must leave something behind in order to function as a history in small of some historical detail of the dreamer's life, and thus to stand in for neurosis,

which Freud defines as the pathological repetition of the neurotic's past (we are told that "*Hysterics suffer mainly from reminiscences*") (*SE* 2:7). The neurotic syndrome is given dimension by the undeniable materiality of its enactment; hysterical and obsessional neurosis usually makes itself explicitly seen in the patient (Laplanche and Pontalis 267, 195). The dream-text, then, serves the crucial function of recuperating what would otherwise leave behind no trace of itself, and brings those diaphanous nighttime scenes and images into relief by translating them into words, which in turn provide the broad referential ground necessary for interpretation. As noted above, Freud writes in "The Aetiology of Hysteria" that analysis seeks to "induce the symptoms of a hysteria to make themselves heard as witnesses to the history of the origin of the illness" (*SE* 3:192). If "*the interpretation of dreams is the royal road to a knowledge of the unconscious activities of the mind,*" then the dream-text, in standing in for the symptom-witness, confirms the thesis, suggested above, that for Freud language is conceived of as a species of witness.

Kilroe cites Carl Jung's statement presupposing the "adequacy of the dream report as a valid object of textual inquiry":

The "manifest" dream-picture is the dream itself and contains the whole meaning of the dream What Freud calls the "dream-facade" is the dream's obscurity, and this is really only a projection of our own lack of understanding. We say that the dream has a false front only because we fail to see into it. We would do better to say that we are dealing with something like a text that is unintelligible not because it has a facade—a

text has no facade—but simply because we cannot read it. We do not have to get behind such a text, but must first learn to read it. (128)

As Freud does, Jung treats the dream report *as* the dream itself, drawing no distinction between the experience and its narration. The dream-text “contains the whole meaning of the dream” which has been managed by the agents of dreaming (the dream-work). These agencies transform the latent dream-thoughts into an “obscurity” which requires the work of interpretation to effect the enlightening journey from the undifferentiated darkness of the ‘dream-façade’ to the light “behind” the dream’s initial illegibility.

It is as if the analyst begins by beholding the inverse side of a weaver’s web and must laboriously displace himself from the tapestry’s disheveled collection of apparently random knots, loose strings, and chaotic imperfections, to gain sight of the embroidered designs of the tapestry’s ornamental face. As with the example of the explorer-analyst (equal parts explorer, detective, archaeologist, and geologist), the work of analysis will then proceed to unearth the buried treasure of unconscious thought hidden behind the feint of the ruin. In dream analysis, the dream-text functions as the ruin, and since it is a text, made up of words and syntactic structures which each stand as a clue to the concealed causal chain linking back into the dreamer’s memory, the felicitous analogy of the dream text as one side of a woven tapestry allows us to envision the work of analysis as both the labour of beholding the clear pictures on the tapestry’s face, and the subsequent work of following each thread or link to its source-point, and thus of unraveling the web until it ceases to exist. In both cases words are multiply conceived of as things. In his analogy of the explorer, Freud includes both the eroded monuments of the ruin along with the tablets and inscriptions on the temple walls as symbols for the

thoughts that the unconscious has worked to conceal and which analysis, through the action of spoken free association, rebuilds, reaching back to the scene of the ruin's original construction. While the textual analogy would seem to visualize a reversal of this process – in tracing the language of the dream-text back through its manifold references to the dreamer's past as well as through the official, etymological, roots of the discrete words that make up the report – by picturing the analysis as the unraveling of threads to unmake the tapestry, this second analogy simply reconfigures its lithic counterpart. That “text” carries within its etymological history the woven web, or the tapestry, both supports the analogy and offers a visual dimension of the action of treating the dream report as a text, as something that can withstand scrutiny and that will reward close reading, which is itself an analytic technique whose aim is to disentangle multiple points of meaning arrived at by the collocation of words.

For Jung as for Freud, the analysand's report of the dream unproblematically stands in for the psychic event. In bringing latent thoughts to light, the dream interpretation, which dissolves the mystery of the dream's manifest form (that chaos on the other side of the tapestry's pictorial coherence), stands in symbolically for the removal, literally the unweaving, in cases of hysteria, of pathological symptoms where, Freud writes, “unravelling them coincides with removing them” (*IOD* 132). As with cases of hysteria, once the symptom is identified (or the dream-text is transcribed), the analysand undertakes the labour of “free association,” which Laplanche and Pontalis define as the “method according to which voice must be given to all thoughts without exception,” (169) and in which, Freud writes,

the patient purposely and deliberately abandons [himself to ‘involuntary ideas’] and employs the psychical energy . . . in attentively following the involuntary thoughts which now emerge [and which, in this purposeful state,] retain the character of ideas.” (*IOD* 134-5)

In this state, writes Freud, “my patients were pledged to communicate to me every idea or thought that occurred to them in connection with some particular subject” (*IOD* 133). The technique of “free association” requires the analysand to adopt a pre-analytic state of mind, or to abandon what Freud calls the “self-observer” component of conscious thought, and in this scene the analyst supplants that psychic function, becoming the observer, and boldly scrutinizing the secondary text produced by the analysand’s abandonment of herself to the flow of “involuntary ideas” (*IOD* 134). From the secondary resource of the analysand’s responses to cues from the dream-text, the analyst conducts the “scientific procedure” that translates the words of the dream-text into the “numerous ideas” of which they are the “nodal points” (*IOD* 132, 376). As nodal points, words are understood by Freud as each potentially “designating a center of convergence or divergence,”¹⁸ and as such any word or phrase in the dream-text can function as a resting point from which meaning emanates. To borrow a phrase from Rasula and McCaffery, the “subterranean logic of words,” or their broad referential potential, makes them, in Freud’s view, akin to the evidence in the natural world of the earth’s deep past (290). Freud goes so far as to explicitly align dreams with strata, saying that it is “as though the dream were a geological conglomerate in which each fragment of rock required a separate assessment” (*IOD* 131). As the visual artist Robert Smithson writes,

Words and rocks contain a language that follows a syntax of splits and ruptures. Look at any *word* long enough and you will see it open up into a series of faults, into a terrain of particles each containing its own void.

(*qtd. in Rasula and McCaffery 473*)

When, for example, a dreamer states in the dream report that ““here there are some gaps in the dream; there’s something missing,”” Freud (as Lyell and Darwin did before him) treats the absence of evidence as information about the structure being represented (*IOD* 368). As the geologist who observes the cliffs of Dorset learns not to be seduced by the appearance of abbreviated time when the eye perceives monuments of distinct geological eras in contact with one another, but instead undertakes the labour of imagining into being the great yawning gaps of time unrepresented by petrified sedimentation; and as the biologist who looks to fossil records for evidence of speciation refuses to be flummoxed by gaps in the evidence into deducing disparity between like specimens, but instead imaginatively reconstructs the causal chain linking two organisms according to inductive reasoning, so the psychoanalyst is not dismayed by the “gaps in the dream” and does not conclude that “there’s something missing” signifies an irrecoverable absence or loss. Quite the reverse; he finds in this lacuna of the dream-text a plenitude. Smithson’s “void” is precisely that space into which psychoanalysis builds as it follows the fault lines of its word-rocks (*IOD* 588). As the geologist discovers that gaps in the stratigraphic record document periods in which sedimentary deposit was unsuited to preservation, for the psychoanalyst “gaps in the dream” chronicle a correlating experience in the dreamer’s past, in this case, his childhood experience of women’s genitals as “gaps” or the *lack* of the male organs (*IOD* 368).

In his dream of Irma's injection Freud offers the first example in *The Interpretation of Dreams* of analysis treating the dream-text like a poem, whose word choices and groupings are given the same attention a critic might lend to the rich texture of one of John Keats' Odes, where parsing phrases like "alien corn" and "Pipe to the spirit ditties of no tone" alerts the reader to the guiding ideas of forlornness in one poem, and the richness of the intellectual life in the other.¹⁹ When, in the sample dream, Freud's dream-text notes "*I at once called in Dr. M., and he repeated the examination,*" the "'at once' was sufficiently striking to require a special explanation" (144). The urgency implied by the phrase "at once" is taken as a signal rather than a simple notation of a precipitous action. The phrase is interpreted as standing in for "all the occasions which I could bring up against myself as evidence of lack of medical conscientiousness" (144). Each word of the dream text has a part to play in delineating the psychic monument it is designed to commemorate. "Just the reverse" in a dream-text can stand in for "a contradiction, a contrary or a 'no'"; a "when" in the dream-text stands in for a "conditional [or an 'if'] in the dream-thoughts"; the common phrase "But then it was as though at the same time it was another place, and there such and such a thing happened," we are told, "turns out to be a subordinate clause in the dream-material," and so on (361, 371). When the agency of condensation pares the latent thoughts down to a single dreamt word, as is the case with "*erzefilisch,*" the "verbal malformation," like the misleading cross-section of deep time figured by the Dorset cliff, reveals itself to be the compression of four separate concepts which, once they are each enlarged and made distinct one from the other, produce a sentence tracing a cause and effect (beginning with "My talk" and ending with "had a poisonous effect") (*IOD* 338).²⁰

Unlike the reader of poetry, however, the analyst, in assuming the function of ‘self-observation’, has access to the primary sources to which the dream-text alludes because, Freud informs the reader, even the dreamer’s remotest past is preserved within the confines of her memory (*IOD* 134). Describing him as “keen-sighted,” Freud cites F.W. Hildebrandt’s observations on memory:

Hildebrandt is unquestionably right in asserting that we should be able to explain the genesis of every dream-image if we devoted enough time and trouble to tracing its origin. He speaks of this as “an exceedingly laborious and thankless task. For as a rule it ends in hunting out every kind of utterly worthless psychical event from the remotest corners of the chambers of one’s memory, and in dragging to light once again every kind of completely indifferent moment of the past from the oblivion in which it was buried in the very hour, perhaps, after it occurred.” (*IOD* 53-4)

In Hildebrandt’s description of the work of dream analysis, the analyst is staged as a heroic collator. His labour is grueling, tedious, and thankless: he ‘hunts’ even the most “indifferent moment” or “worthless psychical event” in the far reaches of the analysand’s mind; he ‘drags’ things from the obscurity into the light; and in so doing discovers the “origin” – the very genesis-point – of a given thought behind a “dream-image.” Once again figurative language functions in *The Interpretation of Dreams* to make psychic and interpretive processes manifest, this time lending particular density to the heroic labour of analysis which seeks to correlate events in the dreamer’s past into a visible succession. And once again, the language of geology and archeology infiltrates the vernacular of the dream book. This is not only because of Hildebrandt’s adjective “buried,” though the

word territorializes the effort of analysis, but rather, because of the remarkable similarity between motifs of analysis and the phrasings and conceptual models of early geological texts.

IV.

The relationship between Freud's dream book and Lyell's theory of uniformitarianism will inform the final remarks of this chapter, but for now we turn to the mineralogist William Smith who, between 1815 and 1817, produced three key studies of the guide fossils to be found in British strata.²¹ As an engineer and mineral surveyor, Smith travelled extensively, over a twenty-four-year period, throughout England, Wales, and Scotland, in order to 'delineate' "British Strata" with the goal of 'discovering' "the greater part of [the] island," and drawing a "general mineralogical survey" "large enough to show the general course and width of each stratum of the soil and minerals, with a section of their proportions, dip, and direction, in the colours most proper to make them striking and just representations of nature" (Smith *Memoir* 2). In *Romantic Rocks* Noah Herringman details Smith's role in helping to establish a "new geological context" (172). Published in the intervening years between Hutton's *Theory of the Earth* and Lyell's *Principles of Geology*, Smith's classification of British strata brings a taxonomical attention to the stratigraphic layers observed by Hutton and spoken for by Lyell. We turn to Smith here because his theory of "organized Fossils" – which takes as its premise that in nature "there seems to have been one grand line of succession, a wonderful series of organization successively proceeding in the same train towards perfection" – postulates

an intelligible earth which, if systematized by the right method, can recite its own past by tracking back through the “organized Fossils imbedded” in its strata (*System* xi, x). Smith marvels at “the boundless extent of creation” (xi), citing:

[The] endless gratification [that] may be derived from mountains of ancient *animated* nature, wherein extinct animals and plants innumerable, with characters and habits distinctly preserved, have *transmitted to eternity their own history*, and the clearest and best evidence of the earth’s formation. (xi; emphasis added)

Setting aside the teleological character of Smith’s model for ‘succession’ we are left with a vision of the earth, literally, the ground beneath our feet, being filled to bursting with fossilized information which can guide the geologist in his efforts, in Herringman’s phrase, to “correlate rock strata” (163). In Smith’s vision, fossils, “the antiquities of the earth,” collate the operations of the material world into a neat ‘succession’ (*System* ix-x, xi). Smith’s “finely preserved” fossils, “which have been quietly entombed in the Strata, with all the form, characters, and habits of life, in the places where they are,” awaken to the onlooker an “ancient animated nature” which is loquacious on its own behalf (*System* viii, x, xi). Smith’s work marks an important step in the development of the geological sciences because his system maps an earth willing to narrate its own history. A decade later, Lyell must acknowledge the staggering gaps in the stratigraphic record, as well as the equally immense lacunae in the fossil record. And thus Lyell’s system relies upon the geologist’s special joint faculties of reason and imagination, and the narrative concept of uniformitarianism, to establish for the reader as for himself a record, or a sequence, of the earth’s successions. For Smith, “extinct plants and animals innumerable . . . have

transmitted to eternity their own history,” and the specimens he unearths “materially assist in identifying the Stratum to which they belong” (xi, ix). Stratigraphic succession, as it is imagined by Smith, conceives of the earth as a storage place for the treasures of the past. And in Smith’s system, the past is narrated by guide fossils, which, he wrote in 1816, are “fixed in the earth so as not to be misplaced; and may be as readily referred to in any part of the course of the stratum which contains them, as in the cabinets of the curious” (*Strata* 1). Smith affirms not only that “nature furnishes the clue” to scientific research, but that the stratigraphic record “must lead to accurate ideas of all the surface of the earth, if not to a complete knowledge of its internal structure, and the progress and periods of formation” (*Strata* 1, *Memoir* 6). As with Freud, Smith’s figurative language – the key metaphor of the organized fossil alongside the analogical concept of a stratigraphic cross-section as a well-ordered collection of curiosities – has the dual function of staging the data afforded by the natural world as eminently interpretable and of fleshing out and materializing the fragmented remnants of the earth’s deep past. Extrapolating from fragments lends them dimension and the density necessary for scrutiny.

When Freud writes, in his case history of Dora, or “The Fragment of an Analysis of a Case of Hysteria,” that he “had no choice but to follow the example of those discoverers whose good fortune it is to bring to the light of day after their long burial the *priceless though mutilated relics of antiquity*,” and that in so doing he had “*restored* what [was] missing,” his language, through the archeological model, deploys key concepts of foundational geological texts, like Smith’s and like Lyell’s, and folds into the lexicon of psychoanalysis the geological assertion that the earth as we see it today is the product of

deep time and that its antique past is recuperable (*SE* 7:12; emphasis added). Like Lyell's restorer in imagination, Freud's "discoverer" labours to 'restore' "what is missing," 'constructing' "where the authentic parts end" (*SE* 7:12). In Freud's system the analyst is both the Lyellian mental traveller and Smith's fossil-guide. Whereas Smith's insistence that guide fossils correlate strata and thus enable the geologist to collate events of the past into "one grand line of succession" chafes against our understanding of a Lyellian or Darwinian earth, where gaps in the fossil record require the scientist to imaginatively reconstruct unpreserved scenes, nevertheless we can see in Freud the combination of these visions of the recuperable past (*System x*). Freud's model of the psyche has much in common with Smith's stratigraphical system, for in Freud's view "the prominent feature of unconscious processes [is] that they are indestructible" (*IOD* 616). In other words, the mind, like Smith's "mountains" filled with "innumerable" "treasures of an ancient deep," preserves records of the thoughts and events of the whole life (*System x*, ix). Indeed the mind offers a far more stable catalogue to the individual's past than the terrain that preoccupies the geologist's or biologist's inquiring gaze. Like the earth, the mind reveals "the patient's psyche" when the analyst's "excavations" "uncover layer after layer" of preserved psychological events (Pankejeff 139). Though the geologist concerns himself with strata, which may record an epoch, and the psychoanalyst concerns himself with layers, which may, in Hildebrandt's language, record an "indifferent *moment* of the past . . . buried in the very hour, perhaps, after it occurred," in both cases the apparently obscure past is brought into the light and made manifest into a territory that may be traversed (*IOD* 54; emphasis added). In the *Principles of Geology* the scientific imagination enables the geologist to mentally "traverse the globe from pole to pole" and, at the same

time, to ‘behold’ “when he restores in imagination” events of the past which have escaped even the earth’s record-keeping (I 159). In *The Interpretation of Dreams* and elsewhere in his oeuvre, the mind for Freud is made up of ‘paths’, ‘circuits’, ‘roads’, and ‘defiles’ which the analyst navigates as he journeys to the monuments erected to ‘commemorate’ remembrances.

In the dream book Freud writes that unconscious wishes “represent paths which can always be traversed,” that they “are always active,” that they are “perceptible during the day,” and, as noted above, that “they are indestructible” (616). The unconscious offers up to natural science a ground even more fertile than Smith’s “abundantly stored” mountains (*Strata 2, System x*). Unlike fossils which are dependent for their preservation upon the felicitous timing of a given era’s sedimentary deposits, Freud asserts that the operations of the unconscious are permanent. He writes:

In the unconscious nothing can be brought to an end, nothing is past or forgotten. This is brought most vividly home to one in studying the neurosis, and especially hysteria. The unconscious path of thoughts, which leads to discharge in hysterical attack, immediately become traversable once more, when sufficient excitation has accumulated. A humiliation that was experienced thirty years ago acts exactly like a fresh one throughout the thirty years, as soon as it has obtained access to the unconscious sources of emotion. (*IOD 617*)

To Smith’s model of the intelligible earth, where guide fossils narrate the deep past stratum by stratum, may be added Freud’s model of the mind, where mnemonic elements of the past are invulnerable to erosion, coexisting in the vast expanse of unconscious space.

In the form of the symptom or the dream-text (the psychic forms “perceptible during the day”) the mind materializes witnesses to the operations of an individual’s past (commemorated in the obscurity of the unconscious). Like “the poet, [who] *unravels the past*, [and] *brings to light* the guilt of Oedipus,” the analyst-discoverer interprets the cryptic map the symptom makes to find the “paths which can always be traversed” in the analysand’s mind (*IOD* 296, 616; emphasis added). Whereas Lyell and Darwin were forced to imaginatively ford insuperable gaps in the fossil record, the skilled psychoanalytic discoverer is pictured travelling on roads, paths, and cavernous defiles through the processes and operations of the past he seeks to understand. And whereas both Lyell and Darwin dwell (consciously and unconsciously, comfortably and uncomfortably, in that order) upon the role that figurative language and its parent, the imagination, play in enabling them to map what was not there and could never be seen, for Freud this problem is resolved in one fell swoop, as he conflates “the scientific terms” with “the figurative language, peculiar to psychology” (*SE* 18:60). That the language of scientific discovery *must* be figurative is apparent from Lyell to Freud, where the connective work of metaphor enables an unobservable process (like natural selection) to be manifested, or where the accelerating properties of narrative (as in the concept of uniformitarianism) allows the author to draw the earth’s processes as a continuum, all the while knowing its actions to be non-sequential non-events. But of the three theories (of geology, biology, and psychology) under close examination here, Freud’s stands alone in its assertion that the object under observation can not only readily be restored through the connective propensities of the analyst’s mind into an analogical stand-in, but that this

stand-in (whether a ruin or a tablet or a web) may possess both the dimension and density adequate to experiential, observational analysis.

Freud's unconscious shares the fundamental characteristic of the earth's processes as detailed by Lyell and Darwin. As with the gradual uplift and subsidence of strata, and as with speciation and extinction in nature, the unconscious is a non-directional, impersonal agent of the mind (recording apparently "indifferent" moments as well as traumatic or 'important' ones) whose operations are not directed by the peripheral psychological apparatus we call consciousness. Both to insist that unconscious mentation is not merely a subordinate by-product of conscious choices, and to tie the operations of the psyche to embedded guiding functions, Laplanche and Pontalis note that "its 'contents' are 'representatives' of the instincts" (474). The mechanisms of modification for the earth and its inhabitants are echoed in Freud's sense of how content is established in the unconscious mind. As the parent species of the rock pigeon does not *choose* for members of its progeny to journey down a developmental path in order to be modified eventually into the tumbler pigeon (we know the change to be a protracted and diffuse process of slow, branching variation), so the conscious mind does not *select* memories to become represented in the unconscious mind by their modified forms (in Freud's terms, their displaced, condensed, or symbolic representations). As the subject journeys through life, her experiences are catalogued much as the fossil is folded into stratigraphic layers. But unlike the partial avenues available to geological inquiry (Lyell frequently remarks wistfully about the buried treasure concealed beneath sea-beds or deep inside mountain ranges), Freud's domain is both more stable in its preservation of data and far more navigable. Freud states that it is possible for any and all memory data to be preserved –

even the most “indifferent” – and that “in the unconscious nothing can be brought to an end” (*IOD* 53, 616). If a “mental act” is “truly unconscious” then it is “indestructible,” and it is part of a ‘path’ which has been “laid down once and for all, [and] which will never fall into disuse” (*IOD* 591 *n.*).

If we look for direct binding ties between Freud’s work and that of Lyell or Darwin, it soon becomes clear that Lyell’s lithic domain offers a more stable model for the conceptual framework of psychoanalysis. In the final pages of the *Origin*, Darwin writes of his hopes that post-Darwinian psychology “be based on a new foundation, that of the necessary acquirement of each mental power and capacity by gradation” (*Origin* 458). Freud’s original ambition – perhaps in part an answer to Darwin’s call – to chart the biochemical processes of thought, to prove “that mental activity is bound up with the function of the brain,” and “to think of ideas as stored up in nerve-cells and of excitations as travelling along nerve-fibres,” he tells us, “miscarried completely” (*SE* 14:174). In spite of this, both directly and by the indirect means detailed here, Darwin’s theory and methods continue to influence Freud throughout his career,²² but it is the language and domain of archeology and geology that most starkly recur in Freud’s oeuvre. In a letter to Fleiss composed December 6, 1896, Freud writes:

As you know, I am working on the assumption that our psychical mechanism has come into being by a process of stratification: the material present in the form of memory-traces being subjected from time to time to a *re-arrangement* in accordance with fresh circumstances—to a *re-inscription*. Thus what is essentially new about my theory is the thesis that memory is present not once but several times over, that it is laid down in

various species of indications. I postulated a similar kind of re-arrangement some time ago (*Aphasia*) for the paths leading from the periphery [of the body to the cortex]. (*SE* 1:233).

From the geological (indeed, Lyellian) model of upheaval and subsidence (in which destruction in one quarter leads to repair in another), where the slow building of strata through sedimentary deposits stands in for memory and where the memory content of the unconscious is continually subject to “*re-arrangement*,” Freud moves seamlessly to the idea of “*re-inscription*.” Once again, words and rocks are figuratively combined, with the movement of Freud’s thoughts being *from rocks to words*. The language of archeology and geology, with its concern for depths, layers, rupture and repair, as well as its promise to provide a key to the hieroglyphics of human history and the earth, stands in for ‘inscriptions’. To use Rasula and McCaffery’s arresting phrase, it is the “subterranean logic” of words, with their winding etymological history, that is so fruitfully brought out through Freud’s deployment of the languages of archeology and geology. The events of our life are inscribed onto the unconscious mind, and the unconscious mind transcribes itself back out into the world through the symptom or the dream-text.

Perhaps the most fascinating, and at the same time, the most embedded, connection between Freud’s characterization of the operations of the unconscious and the work of analysis to the earth and human sciences, is its tie to Lyell’s concept of uniformitarianism (which is, of course, developed by Darwin and applied to the operations of the organic world). In his letter to Fleiss Freud conceives of the unconscious mind as being in a perpetual state of flux, which he calls “*re-arrangement*” and “*re-inscription*” (*SE* 1:233). Though Freud never actually calls it a natural law, the

function of psychic retention he repeatedly describes as an absolute character of the unconscious has much in common with the theoretical principle that “a particular phenomenon always occurs if certain conditions be present.”²³ One of Lyell’s most pressing contributions to the earth sciences was the eloquent case he made for the earth’s being subject to a single, unified natural law, rather than a separate system than the one governing the planetary modifications of antiquity. And in Freud’s considerations of the “active” operations of the unconscious, and the “indestructible” character of its content, the reader of Lyell and Darwin perceives another correlation between Freud’s psychoanalysis and two founding pillars of the natural science to which he was contributing. To the uniformitarian concept that stratigraphic and biological phenomena are subject to ongoing and active processes, where change occurs incrementally, Freud adds the psyche. If “*the interpretation of dreams is the royal road to a knowledge of the unconscious activities of the mind,*” then the dreamer is for Freud a uniformitarian figure, since she proves to be subject to the ongoing and active processes of unconscious mentation, and since the dreamer’s mind reaches into the recesses of her own deep time, surfacing, through the manifest dream content, with relics preserved for all time in the yawning immensity of her unconscious. The dreamer manifests the uniformitarian principle by demonstrating that the operations which have shaped her, during her ‘pre-history’, are ongoing and active in the dream, where “connections” are drawn “with material from this prehistoric period” (*SE* 1:274).

From the uniformitarian dreamer we move to the process of analysis itself. In his 1937 essay on “Analysis Terminable and Interminable” Freud meditates on whether an analysis can ever fully accomplish its conclusion, asking: “Is there any possibility at all

of bringing an analysis to [‘a natural’] end?” (SE 23:219). His conclusions are not satisfactory if the aim of analysis is understood to be the “radical and permanent cure” (217). Whether because of the complex system of internal ‘hostile’, ‘partisan’, and “defensive mechanisms” in the analysand’s unconscious, those “resistances” and “defences” “against recovery,” which seek to preserve the contorted thought-monuments built by the various agencies of the unconscious, or because “psycho-analytic therapy . . . is a time-consuming business,” analytic treatment, while not “altogether an endless business” is nevertheless a long-term and ongoing process.²⁴ “The business of the analysis,” he writes with reference to “character analysis,” is often “to secure the best possible psychological conditions for the functions of the ego,” and not to “rub off every peculiarity of human character” (250). And while in the case of “therapeutic analysis” he writes that “every experienced analyst will be able to recall a number of cases in which he has bidden his patient a permanent farewell *rebus bene gestis*,” (“Things having gone well”), at the end of his career Freud refuses to make a firm case for the terminability of analysis (249-50). How could analysis be terminable when the processes it interprets are continuous and ongoing?

In his subsequent discussion of instincts, Freud writes that “the theory of Empedocles . . . especially deserves our interest [because it] is one which approximates so closely to the psychoanalytic theory of the instincts that we should be tempted to maintain that the two are identical” (245). The turn to Empedocles is key because it allows Freud to subtly underscore the “interminable” of his title by voicing his regard for a philosopher who

thought of the process of the universe as a continuous, never-ceasing alternation of periods, in which the one or the other of the two fundamental forces [eros and destructiveness] gain the upper hand, so that at one time love and at another strife puts its purpose completely into effect and dominates the universe, after which the other, vanquished, side asserts itself and in its turn defeats its partner. (*SE* 23:246)

While this process of eternal reversal cannot, in any simple sense, stand in here for the principle of uniformitarian flux, Freud's decision to include a long aside on Empedocles' conception of interminable processes in an essay ostensibly defending the curative value ("analysis terminable") of psychoanalysis calls for a closer look. While he is unwilling to state baldly that analysis ought not to be thought of as terminable, he does declare that:

Every analyst should periodically—at intervals of five years or so—submit himself to analysis once more, without feeling ashamed of taking this step. This would mean, then, that not only the therapeutic analysis of patients but his own analysis would change from a terminable into an interminable task. (*SE* 23:249)

Since the "paths" of the unconscious "can always be traversed," and since "in the unconscious nothing is past or forgotten," it must be understood that the analysand, though perhaps dissolving through the interpretive work of analysis one commemorative monument to a psychic reminiscence, can only be cured of pathological *monuments* to thought, not of the *thought-path* itself (*IOD* 616). If it is understood as a mode of self-examination, analysis can never be thought of as a terminable task. New "passions" and "internal conflicts" will arise, necessitating another analysis (perhaps "at intervals of five

years or so” in the case of the analyst who, presumably, is better equipped to cope with “all the instinctual demands” every individual is called upon to ‘suppress’) (*SE* 23:250).

V.

Hysterics suffer from the recurrence of memory and the past. Neurosis, like the dream, alerts us to the uniformitarianism of the psyche, where the past is seen to be ongoing and repeated, and where the symptom or the dream manifests a trace of causes still in operation from the individual’s remotest antiquity or “prehistory.” For Freud, the psyche is the best preserver of the past – better than the strata and fossils geologists and biologists look to for insight into the operations of the lithic and organic history of the earth. When, in *Civilization and its Discontents*, he turns to the “problem of preservation in the sphere of the mind,” he confirms that even “forgetting” does not signify “a destruction of the memory-trace—that is, its annihilation,” for in “mental life nothing which has once been formed can perish” and “everything is somehow preserved and . . . can once more be brought to light” (*SE* 21:69). As if to answer the objection that he cannot possibly contend that *every* event of the life is somehow preserved in the chambers of the unconscious, ready to be surfaced by the “regression” of analysis to answer the riddle of a symptom, Freud turns to “another field,” specifically, Darwin’s. He writes that “in the animal kingdom . . . we find all the simple forms still in existence today” (68). Continuing, he explains how the “race of the great saurians is extinct and has made way for the mammals; but a true representative of it, the crocodile, still lives among us” (68). In true Freudian style, he goes on to counter his own analogy, saying that “the

lower species which survive are for the most part not the true ancestors of the present-day more highly developed species,” and that “as a rule the intermediate links have died out and are known to us only through reconstruction” (68). Although Freud acknowledges, for instance in the case history of his analysis of “Dora,” that when his “analytic results” are ‘incomplete’, his interpretive ‘restorations’ are sometimes the result of “constructions” added to the “authentic parts” of the “priceless though mutilated relics of antiquity,” he is generally loath to admit that, as is so often the case for the Darwinian observer of the “mutilated relics of antiquity” (and as the evolutionist must do for the species), the analyst participates in imaginative “reconstruction” of the analysand’s past (*SE* 7:12, *SE* 21:68). Though the crocodile is an uneasy stand-in for the “race of the great saurians,”

in the realm of the mind, on the other hand, what is primitive is so commonly preserved alongside of the transformed version which has arisen from it that it is unnecessary to give instances of evidence. When this happens it is usually in consequence of a divergence in development: one portion (in the quantitative sense) of an attitude or instinctual impulse has remained unaltered, while another portion has undergone further development. (*SE* 21:68-9)

For the most part, he claims, the analyst’s task is to enable sufficient regression, that is, the work of tracing backward through successions of thought through the “relaxation of a certain deliberate . . . activity which we allow to influence the course of our ideas while we are awake,” thus allowing for the ‘emergence’ of “involuntary ideas” that operate as road maps to ever-earlier thoughts in the mind of the analysand (*IOD* 134). The analyst

assumes the function of “self-observer” and travels into the mental past of the analysand on roads paved by the unconscious agents of thought (134). In *Civilization and its Discontents*, Freud writes that as opposed to the natural world, where the “intermediate links have died out,” the *mind* “preserves” a more complete record of the forces – the variations, or the “portions which have undergone further development” – which have brought about the person who occupies the present moment (*SE* 21:68). Whereas the fossil record available to Darwin in his attempts to reconstruct processes of speciation is sadly incomplete, the mind’s retentive capacity fossilizes the conditions that lead to the present moment of analysis.

Dissatisfied with the Darwinian analogy, Freud “choose[s] as an example the history of the Eternal City.” He writes:

Historians tell us that the oldest Rome was the *Roma Quadrata*, a fenced settlement on the Palatine. Then followed the phase of the *Septimontium*, a federation of the settlements on the different hills; after that came the city bounded by the Servian wall; and later still, after all the transformations during the periods of the republic and the early Caesars, the city which the Emperor Aurelian surrounded with his walls. (*SE* 21:69)

As is so often the case with Freud, the preferred analogical model is the ruin, for the lithic paradigm, even when it is represented as eroded, a crumbled heap, offers the most stable ground for the materialization of the operations of the psyche. Rocks, which, in nature, survive eons of upheaval and subsidence to form a stratigraphic record of the past, and which, in human constructions, preserve, even in their ruined form, traces of remotest history, are the best stand-in for the monument-making of the unconscious mind. With

the example of Rome we are in the archeologist's terrain, but, as Lyell does with his explanation of the geologist's mental travels, Freud invests his archeologist with special powers of observation and analysis. He writes:

We will not follow the changes which the city went through any further, but we will ask ourselves how much a visitor, whom we will suppose to be *equipped with the most complete historical and topographical knowledge*, may still find left of these early stages in the Rome of to-day. Except for a few gaps, he will see the wall of Aurelian almost unchanged. In some places he will be able to find sections of the Servian wall where they have been excavated and brought to light. If he knows enough—*more than present-day archeology does*—he may perhaps be able to trace out in the plan of the city the whole course of that wall and the outline of the *Roma Quadrata*. (SE 21:69)

As Lyell does in his analogy of the geologist who “restores in imagination the scenes presented by certain regions at former periods” by mentally collating both the eons of stratification that make up the earth's deep past, and by accelerating these processes into a unified narrative which sutures the discontinuous past into a sequence, Freud here imagines a “visitor” in the form of an archeologist with preternatural mental powers which enable him to unify the great history of Rome into a mental “plan.” Like Lyell's geologist, who enjoys a special inner faculty of sight, resulting from the combined faculties of reason and imagination, Freud's archeologist is “equipped with the most complete historical and topographical knowledge,” and indeed, knows “even more than present-day archeology does.” He continues:

It is hardly necessary to remark that all these remains of ancient Rome are found *dovetailed into the jumble of a great metropolis* which has grown up in the last few centuries since the Renaissance. There is certainly not a little that is ancient still buried in the soil of the city or beneath its modern buildings. This is the manner in which the past is preserved in historical sites like Rome. (*SE* 21:70; emphasis added)

The Rome of today fits together ('dovetails') to form a continuous whole with the Rome of the past. Elements of the past may be wedged together, as they are in Freud's analogy of the analyst-explorer in "The Aetiology of Hysteria," where a ruin is reconstructed through the work of regression in analysis, and the past is revealed and made available to observation. In Freud's analogy of Rome we find traces not only of Lyell's mental traveller, but of Darwin's fantasy of observation. Whereas in the *Origin* the phrase "It is interesting to contemplate an entangled bank" can never actually describe the perspective of the evolutionary scientist, in Freud's vision the sites of the past are commemorated by ruins which the work of regression can reconstruct, stone by stone, until every contour of the ancient city may be traced into being and scrutinized by the analyst-visitor (459).

Finally, he writes:

Now let us, by a flight of imagination, suppose that Rome is not a human habitation but a psychical entity with a similarly long and copious past—an entity, that is to say, in which nothing that has once come into existence will have passed away and all the earlier phases of development continue to exist alongside the latest one. (70)

It is very rare to find in Freud's work deprecating phrases such as "by a flight of imagination," for, as he asserts in *Beyond the Pleasure Principle*, metaphors, those children of the imagination, are necessary to science's forward reach into the unknown, and therefore not to be dismissed (*SE* 18:60). This phrase marks the first of several hedging remarks in the final few pages of this first chapter of *Civilization and its Discontents*. Indeed, he later remarks, by way of conclusion: "perhaps we are going too far in this. Perhaps we ought to content ourselves with asserting that what is past in mental life *may* be preserved and is not *necessarily* destroyed" (*SE* 21:71). Faced with these hesitations the reader of Freud must assume the courage of Nietzsche's Zarathustra, who dwells in the epigraph to this chapter, and, when faced with goblins, must move ever forward, embracing each new challenge. Indeed, this is Freud's method. As he did in *The Interpretation of Dreams*, where contradictions and revisions are folded into the text and misconceptions go undeleted to enact on the page the very process of thought, here Freud acquiesces to an anticipated complaint but does not modify the tone of his earlier assertions. Indeed, the fervor with which he makes his assertions of the retentiveness of the psyche far surpasses the tone of statements that undergo revision in the dream book, making the earlier assertions in *Civilizations and its Discontents* far more resilient to the contradictions that follow. Like the psyche he describes his own text retains the firm assertions that came before; they are not subsumed by the statements that follows them, but rather inform those later near-contradictions to demonstrate to the reader the suppleness of the theoretical process, where ideas are always in flux, even when they are marked in indelible ink on the page. In addition to his uniformitarian subject, then, Freud adds the uniformitarian text, where nothing is ever complete.

Notes

¹ See page 28 of Friedrich Nietzsche's *Thus Spoke Zarathustra*, "On Reading and Writing."

² I use this word with both parts of its definition in mind. That is to say, to signal the action of thinking (a psychological process), as well as Freud's interest in the physiological processes, and effects, of thought.

³ Charles V. Rzepka (2005) also explores the connections between Freud's psychoanalytic writings and detective fiction. Rzepka also takes up the figure of the explorer and archeologist in Freud's writing, since the detective, explorer, and archeologist are rhetorically linked in Freud's writing on hysteria, dreams, and the unconscious. These motifs will be expanded here, though with a different end in sight.

⁴ (*ID* 647, 549, 155, ...) ("ruins" *SE* 3:192) ("loop-lines..." 314) (layer 392)

⁵ I will throughout use the abbreviation *IOD* for *The Interpretation of Dreams*.

⁶ Although he spoke deprecatingly of contemporary physicians who "choose to read a case history. . . not as a contribution to the psychopathology of neurosis, but as a *roman à clef* designed for their private delectation," Freud nevertheless continually staged the *work* of interpretation as a case of detection, where the analyst must pursue his evasive quarry through the dark streets of the unconscious (*SE* 7:9).

⁷ Suzanne Raitt very effectively draws on this passage in her discussion of metaphor in *Beyond the Pleasure Principle*, where she notes that Freud's "defence of psychoanalysis as a science was thus also. . . a critique of the natural sciences' pretensions to transparency and denotation" (130).

⁸ For further reading on Freud's appeal to empiricism for his scientific practice, see (*SE* 20: 265; 14:117; 16:285).

⁹ As elsewhere, I am here adapting George Levine's phrase (1998 1).

¹⁰ Note here about how this element of Freud's work specifically takes up Darwin's call to Psychology to inquire into this point (see *Origin* 458).

¹¹ See also "Psycho-analysis is a part of the mental science of psychology" (*SE* 23: 282).

¹² In 1833, William Whewell proposed the term "scientist" as an alternative to "natural philosopher." (*Literature and Science* xvii). In 1842, Robert Southey remarked that the medical profession was an art before it was a science, thus advancing from practical skill steeped in superstition to a rational, systematic body of knowledge put in practice by experts. See letter 1934 in *The Collected Letters of Robert Southey*.

"science, n." OED Online. March 2013. Oxford University Press. 7 May 2013

<<http://www.oed.com/view/Entry/172672?redirectedFrom=science>>.

¹³ *ID* reverse (362), distort (363), invert, destroy (347), parody (470 *n.*), dissimulate (175), fragmentary (313), mutilate (550)

¹⁴ See page 135 of Peter Gay's *Freud: A Life for Our Times*.

¹⁵ As Robinson points out (127-150), Champollion was indebted to the rival cryptologist Thomas Young, whose rudimentary hieroglyphic alphabet, as well as the role he played in advising William Bankes on the meaning of his obelisk's inscriptions, were invaluable to Champollion in his eventual decryption of the Rosetta Stone.

¹⁶ See Andrew Robinson, *Cracking the Egyptian Code*, page 137 for further details about Champollion's discovery of the phonetic system for hieroglyphic script.

¹⁷ See *IOD* 131*n*, 144, 146, 442.

¹⁸ "nodal, adj.". OED Online. March 2013. Oxford University Press. 1 June 2013

<<http://www.oed.com/view/Entry/127562?redirectedFrom=nodal>>.

¹⁹ See John Keats "Ode to a Nightingale" and "Ode on a Grecian Urn"

²⁰ Freud explains the compound word "*erzefilisch*" with the following sentence: "My talk [Erzählung] was intended to have an educational [*erzieherisch*] influence on the emotional life of our governess [*Erzieherin*]; but I fear it may at the same time have had a poisonous effect.' '*Erzefilisch*' was compounded from 'erzäh-' and 'erzieh-'" (*IOD* 338).

²¹ The *OED* defines the "guide fossil" as "a fossil species regarded as specially characteristic of a given geological formation, horizon, or fauna." And Smith defines the term "organized fossils" as being "generally applied to all fossil matter that has a relation to the form of any organized body, either animal or vegetable" (*System* xi).

²² See Adam Phillips *Darwin's Worms*, Stanley Edgar Hyman *The Tangled Bank*, and Gillian Beer, *Darwin's Plots*.

²³ See III a:"law, n.1". OED Online. March 2013. Oxford University Press. 9 June 2013

<<http://www.oed.com/view/Entry/106405?rskey=K61rSr&result=2&isAdvanced=false>>.

²⁴ ('hostile' 245, 'partisan' 245, "defensive mechanisms" 239, "resistances" 239,

"defences" 238, "against recovery" 238, "psycho-analytic therapy..." 249).

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Nineteenth-Century Science and Figurative Language." *Literature, Science,*

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- . *Strata Identified by Organized Fossils, Containing Prints on Paper of the Most Characteristic Specimens in Each Stratum*. London: W. Arding, 1816. Print.

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CURRICULUM VITAE

Pascale McCullough Manning

EDUCATION

- 2013 PhD, Department of English, Western University, Canada
- 2008 Primary Field Examination:
Written and Oral, “Nineteenth-Century Literature”
- 2008 Field Study Examination:
Written, “Critical Survey of Literary Scholarship on Darwinism, 1859-2008”
- 2007 Secondary Field Examination:
Written, “Women’s Literature and Gender Theory”
- 2002-2003 MA, Department of English, The University of Alberta
- 1997-2001 Honours BA, English, Trent University

DISSERTATION

- Title: “Strata, Soma, Psyche: Narrative and the Imagination in the Nineteenth-Century Science of Lyell, Darwin, and Freud”
- Supervisor: Prof. Matthew Rowlinson
- 2nd Reader: Prof. Joel Faflak

FELLOWSHIPS, GRANTS & AWARDS

- 2010 Nominated for the Graduate Teaching Award: two nominations, one by Prof. J. Devereux, and one by a student, Joel Szaefer.
- 2010-2011 Ontario Graduate Scholarship (\$15,000.00)
- 2009-2010 SSHRC Graduate Fellowship – Doctoral (\$20,000.00)
- 2008-2009 Ontario Graduate Scholarship (\$15,000.00)
- 2007-2008 Western Graduate Research Scholarship (\$7,131.00)
- 2006-2007 Western Graduate Research Scholarship (\$7,131.00)
- 2001-2002 The Sarah Nettie Christie Graduate Award (\$13,000.00)
- 2001-2002 Ontario Graduate Scholarship (\$15,000.00) (declined to study out of province)
- 2001 Bagnani Award (\$1,500.00)
- 1999 The Margaret Lawrence Scholarship (\$500.00)
- 1997 The Trent University Admission Scholarship (\$500.00)
- 1997-2012 Numerous travel grants

TEACHING AND RESEARCH INTERESTS

Literature of the Long Nineteenth Century, Victorian Literature, Romanticism, Nineteenth-Century Science and Literature, Children’s literature, Popular Culture, North American Indigenous Literatures, Composition.

ACADEMIC PUBLICATIONS

Peer-Reviewed Journal Articles:

“The Restorative Imagination: Narrative Experiments in Charles Lyell’s *Principles of Geology*.” *Literature Compass*. 14 (2014). (Forthcoming)

“A Narrative of Motives: Solicitation and Confession in Linda Hogan’s *Power*.” *Studies in American Indian Literatures* 20.2 (2008).

Peer-Reviewed Co-Authored Journal Articles (First Author):

Manning, Pascale and Andrea Charise. ““Unexamined Eyes’: George Eliot’s Epochal Old Age.” *Seachange Journal*. 4 (2013). (Forthcoming)

Book Contributions:

Author of introductions to appendices (of texts by Charles Lyell, Robert Chambers, William Whewell, and William Paley) (2014) Broadview edition of Tennyson’s *In Memoriam*, Ed. Matthew Rowlinson.

TEACHING EXPERIENCE

Instructor:

2013 EN3444E “Nineteenth-Century Literature,” Western University
2012-2013 EN3444E “Nineteenth-Century Literature,” Western University

Lecturer:

2013 QUEST Writing 188, University of Wisconsin Oshkosh
2005-2006 For Arts Faculty, The University of New Brunswick
Arts 1000: “Development of Western Thought”

Teaching Assistant:

2009-2010 For Prof. Jo Devereux
EN 3444E: “Nineteenth-Century Literature”
2008-2009 For Prof. Nigel Joseph
EN 2500E: “The Novel”
2007-2008 For Prof. Nancy Tausky
EN 2033E: “Children’s Literature”
2006-2007 For Prof. Thy Phu
EN 2017: “Reading Popular Culture”
2000-2001 For Profs. James Neufeld and Zailig Pollock
EN 205: “Form and Context in Literature”

Guest and Invited Lectures:

2011 “Charles Lyell’s Contingent Imagination,” Jackman Humanities Science and Culture Reading Group, University of Toronto (Spring).
2009-10.1 17 hours of guest lectures delivered for course “Nineteenth

- 2009 Century Literature,” Instructor: Jo Devereux, (Fall to Spring).
 “*Peter Pan* and the Cult of Childhood,” delivered for course “Children’s Literature,” Instructor: Nancy Tausky, (Winter).
- 2006-07 “Understanding Laura Mulvey’s ‘Visual Pleasure and Narrative Cinema,’ delivered for course “Reading Popular Culture,” Instructor: Thy Phu (Fall).
 “From the *Indian Act* (1876) to the Red Paper (1970): Shaping Indigeneity in Canadian Law,” delivered for course “Reading Popular Culture,” Instructor: Thy Phu (Winter).

RESEARCH ASSISTANTSHIPS

- 2012-2013 Research and editorial assistant for new Broadview edition of Alfred, Lord Tennyson’s *In Memoriam*. Worked under the supervision of Prof. Matthew Rowlinson. Duties included compiling materials, copy editing, and composing introductions to four appendices.
- 2008 Archival research (including but not exclusive to the Library of Congress, Bibliothèque nationale de France, Bibliothèque de l’Arsenal, and Bibliothèque Richelieu) for Prof. Thy Phu.
- 2005 Editorial Assistant at *Studies in Canadian Literature*, University of New Brunswick. Writing article abstracts for the online edition.

CONFERENCE PRESENTATIONS

- “The Mental Traveller: Charles Lyell’s Geological Imagination and the Poetics of Romanticism.” International Congress of History of Science, Technology, and Medicine. (Forthcoming, Manchester, UK, July 2013).
- “Darwinian Intertexts, or A Network Vision of Darwin’s *The Origin of Species* and the *Autobiographies*.” North American Victorian Studies Association (NAVSA). (Madison, WI, September, 2012).
- “The Restorative Imagination: Narrative Experiments in Charles Lyell’s *Principles of Geology*.” Romanticism and Evolution. (London, ON, May, 2011).
- “The Past is Present: Charles Lyell’s Deep Time and the Perceiving Mind in *Principles of Geology*.” North American Victorian Studies Association (NAVSA) (Montreal, QC, Nov. 2010).
- “Darwin’s *Autobiographies* and the Post-Evolutionary Everyday.” North-east Victorian Studies Association (NVSA) (Wellesley, MA, April 2009).
- “Perceptible Fluxes: The Response of Psychoanalysis to the Theory of Evolution.” History, Hysteria and Narrative. (London, ON, April 2007).
- “‘I Am Because You Are’: Levinas and the Ontologies of Confession.” Centennial Conference on Levinas and the Law. (Montreal, QC, Sept. 2006).

CHAired PANELS

- “Freud and Darwin.” History, Hysteria and Narrative. (London, ON, April 2007).

CONFERENCE WORKSHOPS AND SEMINARS

- Participant, “The Victorianists’ Workshop: New Approaches to Archives, Methods, and Pedagogy.” (Profs. Christopher Keep, Matthew Rowlinson). The Victorian Reading Group at Western. (London, ON, April, 2013).
- Participant, “Darwin and the Mobility of Nature.” (Prof. Alan Bewell). Romanticism and Evolution. (London, ON, May, 2011)
- Participant, “Deep Time.” (Prof. Noah Heringman). Romanticism and Evolution. (London, ON, May, 2011).
- Participant, “Evolution for Victorians.” North American Victorian Studies Association (NAVSA) (Cambridge, England, July 2009).
- Presenter, “The Lyellian Imagination.” Science and Culture Reading Group: The Jackman Humanities Working Groups. (Toronto, ON, April, 2010).

ACADEMIC SERVICE AND AFFILIATIONS

Service:

Program Coordinator, *The Public Humanities @ Western: The Scholarship of Engagement Speaker Series*. “Propositions for Thought in the Act.” Prof. Erin Manning and Prof. Brian Massumi, March 4-5, 2013.

Affiliations:

(NAVSA) North American Victorian Studies Association
 (NVSA) Northeastern Victorian Studies Association
 (VSAO) Victorian Studies Association of Ontario
 (ACCUTE) Association of Canadian College and University Teachers of English
 (MLA) Modern Languages Association
 (SciCult) Science and Culture Reading Group: The University of Toronto Jackman Humanities Working Groups.

LANGUAGES

Fluent in French.

REFERENCES

Academic: Prof. Matthew Rowlinson (mrowlins@uwo.ca), Prof. Joel Faflak (jfaflak@uwo.ca)
Teaching: Prof. Jo Devereux (jdevereu@uwo.ca), Prof. Thy Phu (tphu@uwo.ca), Prof. Nancy Tausky (ntausky@tausky.ca)