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The anatomy of anatomia: dissection and the organization of knowledge in british literature, 1500-1800

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THE ANATOMY OF *ANATOMIA*:
DISSECTION AND THE ORGANIZATION OF KNOWLEDGE IN BRITISH LITERATURE,
1500-1800

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

in

The Department of English

by
Matthew Scott Landers
B.A., University of Dallas, 2002
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ABSTRACT

This dissertation develops a conceptual history of human anatomy, both as a discipline and as an epistemological model. Building on recent scholarship in the history of science, I argue that the basic organization of anatomical inquiry inspired a number of literary productions during the seventeenth and eighteenth centuries. This project counters important critical trends of the last five decades, which have focused on the ambiguous characterization of an anatomical genre without providing sufficient medical context. I argue that intellectual history reveals a persistent epistemological analogy between the body and textual arrangements of human knowledge. By examining this analogical structure, it is possible to theorize about the components and requirements of anatomical inquiry.

Chapter One examines the religious and contexts of anatomy in ancient Greece and medieval Persia and Arabia. In looking at the cosmological doctrines of both societies, I attempt to answer questions about the absence of human dissection in ancient cultures. In the process I identify an alternative mode of inquiry, which I call cosmo-anatomy. Chapter Two discusses the influence of Andreas Vesalius' famous *De humani corporis fabrica* on the organization of anatomical texts in seventeenth-century England. I contend that Vesalius' innovative text sets the stage for both medical and literary anatomical arrangements, including such works as Robert Burton's *The Anatomy of Melancholy*. Chapter Three discusses the poetic backlash against Copernican physics in John Donne's *Anatomy of the World*. I contend that Donne adapts his 'anatomy' to reveal the fundamental influence of traditional cosmologies on the semiotics of metaphysical poetry. Chapter Four explores the narratological structure of Laurence Sterne's *Tristram Shandy*. I investigate the role of memory reconstruction in shaping Tristram's autobiography, highlighting, in the process, the influence of Enlightenment theories of the brain on the digressive condition of Sterne's narrative. Chapter Five considers the importance of the anatomical analogy on

philosophical encyclopedias of the eighteenth century. I look as well at Leibniz's plan for the universal library, arguing that the structure of anatomy influences Enlightenment attempts to organize vast amounts of information in a meaningful manner.

INTRODUCTION

Medical tradition records an influential meeting between the physician Hippocrates and Democritus, the fifth-century Greek philosopher from Abdera. Narrated in a series of eight letters and arranged like an epistolary novella, the story portrays Democritus first as a man who “has lost his reason;” who is “constantly wakeful night and day, laughs at everything large and small, and thinks life in general is worth nothing.” Hippocrates reports the concerns of the Abderites, who, fearing for the life of their most important citizen and for the health of the city itself, send for the famed physician in an effort to “heal a city, not just a man” (Hippocrates 57). Hippocrates arrives in Abdera to find Democritus sitting under a tree next to a stream, “writing something with inspired intensity” (77). Hippocrates comments on the scene:

He had a papyrus roll on his knees in a very neat manner, and some other book-rolls were laid out on both sides. And stacked around were a large number of animals, generally cut up. He sometimes bent and applied himself intensely to writing, sometimes he sat quietly attentive, pondering within himself. Then after a short time of this activity he stood up and walked around and examined the entrails of the animals, set them down and went back and sat down (75).

After being asked about the nature of his examination, Democritus confesses to Hippocrates that his efforts to dissect animals are motivated by a medical purpose. He is not mad, as the Abderites suspect; rather, Democritus is “pursuing the nature and location of the gall” in animals with the hope of completing a treatise on the cause of dementia in men (77-79).

In an alternate account of the meeting,¹ Democritus’ treatise examines “the disposition of the cosmos, about the heavens and about the stars” (93), and not the gall. In both instances, however, the subject of Democritus’ inquiry is the cause of madness in human beings. As a result, the “Democritus Letters” seemingly offer two different diagnostic methodologies for the same problem: a pathological approach on the one hand, and a cosmological on the other. The

setting for both inquiries appears to be consistent, however: dissected animal carcasses surround Democritus as he writes.²

The *Pseudepigraphic Writings* of Hippocrates, of which the “Democritus Letters” are a small part, have not enjoyed wide circulation over the past century. Wesley D. Smith’s 1990 edition represents only the second translation into English, following Littré’s edition of 1861 (Hippocrates ix). For those conversant with seventeenth-century anatomical texts, however—Robert Burton’s *The Anatomy of Melancholy* in particular—the account of Hippocrates and Democritus’ meeting is at least familiar (if not the source). The myth finds a particularly receptive audience during the sixteenth and seventeenth centuries, leading to frequent reiterations. It is this receptivity and—perhaps more importantly—what it represents from the standpoint of understanding in general, that makes the ancient narrative worthy of note for the current investigation.

In the following chapters I will attempt to reconstruct a history of anatomy. Unlike other histories of the body, however, this account will focus on various intellectual modes throughout the centuries, the intent of which was to define human structures in relation to the knowable world, and vice versa. In the process, I will argue that the formulation of anatomy (as an area of inquiry) led to a number of analogous structures, both in the fields of science and literature. These structures, I contend, exist as a special kind of analogy, best described by Lucien Goldmann’s meaning of the word ‘homology.’ Homologies, according to Goldmann, describe a situation in which formal expressions of the “literary plane” emanate from significant structural relations to certain “aspects of social life” (Goldmann 7). In the case of a “rigorous homology,” Goldmann writes, “one might speak of one and the same structure manifesting itself on two different planes,” such that a particular literary form can be seen as “the culmination at a very advanced level of coherence of tendencies peculiar to the consciousness of a particular group,

a consciousness that must be conceived as a dynamic reality” (8-9). If one can disentangle the idea of homologues from Goldmann’s strictly Marxist treatment of the novel, an interesting rubric emerges, from which one might categorize literary anatomies in a manner previously unimagined. No longer is it necessary to define literary anatomies—such as Burton’s *Anatomy of Melancholy*—as mere reflections, or imitations of a scientific counterpart. Rather, one can begin to make the case that the ‘anatomy’ evidences a dynamic reality, from which particular structures emerge as reifications of conscious attitudes toward the world and the organization of knowledge.

Perhaps it is important here to attempt to define anatomy. The *OED* suggests three general senses of the word: “I. The process, subjects, and products of dissection of the body;” “II. The science of bodily structure; structure as discovered by dissection;” and “III. Tropical,” or related to the divisions of logic.³ In general, previous attempts to historicize anatomical practices have been limited to one or (at the most) two of these meanings. There have been a number of very helpful examinations of anatomical dissection in recent years. Jonathan Sawday, Andrew Cunningham, and Andrea Carlino each examine the cultural and religious contexts of human dissection during the Renaissance in Europe. Added to these studies are innumerable examinations by scholars of the History of Science, including the more famous examples by Charles Singer and Roy Porter.

Cunningham’s book, *The Anatomical Renaissance*, comes closest to reuniting the three historical senses of anatomy. The methodological course of his investigation—which he describes as “a history of projects of inquiry,” or a history of the “approaches different people at different times took to investigating anatomy, and why” (Cunningham x)—is a crucial element of his success. In adopting the “project” as his locus, Cunningham frees himself from the bewildering minutiae of medical history, which flow from a desire to record every minor

innovation by every anatomist. Against this tendency, Cunningham toils among the broader conceptual narratives of anatomical inquiry, revealing the “intentionality of past actors” and the “nature and identity of their actions” (Cunningham 8). If one were to critique one element of Cunningham’s work, the criticism would be that he does not go far enough in advancing his thesis. His examination of Greek anatomical theory serves the sole purpose of supporting the central claim that Renaissance Europe simply resurrected the projects of ancient anatomists. In doing so, he ignores nearly a millennium of anatomical history, during which time medicine moved to the Eastern kingdoms of Persia and Arabia. The effect that this shift had on European theories of the body is incalculable.

At the same time, Cunningham’s study does not extend into the period most affected by the scientific advancements of the fifteenth and sixteenth centuries: the European Enlightenment. Jonathan Sawday’s book, *The Body Emblazoned* (1995), does a better job in this regard; however, both examinations are limited mainly to a discussion of dissection during the Renaissance. This deficiency originates, I believe, in the notion that dissection and anatomy are equivalent methods of inquiry. The Renaissance represents a crucial moment in medical history, during which human dissection becomes institutionalized. Once the practice is normalized, periods that follow seem less important, or at least less innovative. From an adequately historicized standpoint, however, it is possible to recognize anatomy as a separate, governing mode—as a dynamic intellectual structure. At times the framework of this structure changes, altering, in the process, our corresponding understandings of the organization of the universe, both physically and logically.

From earliest times, however, the human body has been viewed as the supreme example of a fully integrated system. For the Greeks, the term *sustêma* describes the state of the whole composed of its parts. According to the *OED*, one such *sustêma* is demonstrated in the traditional

measurement of musical intervals,⁴ an instance of which is the basic octave. Imagined in this way, systems have borders. They exist simultaneously as inclusive and exclusive structures, since these boundaries act to delineate and categorize content as part of the *sustêma*, or not, based on the presence or absence of natural interrelationships. Quite unsurprisingly then, the human body is the prime model of an enclosed *sustêma*—based on what we might call its systematic embodiment—the boundaries of which are evident and inescapable.⁵ Embodiment is systematic because the flesh/border of the body encloses/delineates a discrete *sustêma*; and because the body-system itself appears to be composed of collaborative parts and micro-systems. Imagined in this manner, anatomy can be described as the science of systematic embodiment—a discipline dominated by efforts to reveal the organizational structure of the human body as a series of interrelated micro-systems, all of which contribute to the integrity of the whole.

Still one may ask: “What part has human dissection played in structuring anatomical inquiry?” History reveals a limited role. Greek and Arab physicians seem to have displayed an attitude of near indifference about the veracity of their knowledge of the human interior (when compared to reformers like Andreas Vesalius). In fact, the relative absence of human dissection during ancient and medieval periods proves (at least obliquely) that anatomy and dissection are not the same thing. The institutionalization of human dissection during the early modern period prompted a revolution in the way that people understood and theorized about the body; yet, I hope to demonstrate that, although the study of anatomy has taken many forms throughout history, the intellectual framework—its homological structure—has remained largely the same.

In this regard, Hippocrates’ account of Democritus is instructive for a number of reasons. The account is pretty clear in attributing Democritus’ actions to philosophic motivations. Hippocrates is the “physician,” summoned by the Abderites to cure Democritus, the “wisest of men” (Hippocrates 75). One is acutely aware, however, that it is the ‘mad’ philosopher who

surrounds himself with dissected animals, not the physician. I believe this detail exposes an important distinction between the epistemological modalities of philosophy and medicine, which are discussed in Andrea Carlino's *Books of the Body*. In short, since both physicians and philosophers of the ancient world had an interest in anatomical structures—to varying degrees and with differing motivations—Democritus is a study in method. Carlino writes:

The anatomical knowledge of the physician was directed toward the healing of diseases afflicting internal organs (when possible) and exterior parts of the body and to the practice of surgery; it was reduced to the essentials (a superficial topographical proficiency) by an extremely powerful etiological, therapeutic, and to a certain degree, self-sufficient paradigm. The anatomical learning of the philosopher on the other hand was directed to the verification and to the mastery of the principles that inform man and nature (Carlino 126-27).

According to Carlino, it was possible for a physician to have just enough anatomical knowledge to make curing illness possible. Such understanding included the ability to “locate the parts of the body in which the humors dwelled or were produced as well as the way by which they could be transmitted from one part to another” (123). Physicians could acquire adequate knowledge by performing surgeries and by observing the occasional victim of violence, without ever resorting to systematic dissection. If the existence of the system is assumed, what need is there to expose it? For the philosopher, conversely, anatomy was a tool for probing the “unknown and invisible.” This was an enterprise unavailable for most physicians of the ancient world, “who were restrained by their own epistemological paradigm” (127). Already in the ancient world then, anatomy can be separated into two modalities: the medicinal (or therapeutic) and the philosophical (or metaphysical). Curiously, Democritus bridges the gap between both; and it is the liminal condition of his approach that appeals to natural philosophers and physicians of the Renaissance and Enlightenment.

I believe that one can characterize at least four types of anatomy operating in the historical record. The first I call ‘Cosmo-anatomy;’ the second ‘physical anatomy;’ the third ‘intellectual,

or logical anatomy;’ and the last ‘literary anatomy.’ In the following chapters I will offer an overview of each. It will be evident, nevertheless, that these modalities do not operate in absolute isolation. Often, two or more types of anatomy are functioning in the same text. This is perhaps most true in the case of the literary anatomy, making it very difficult to define the requirements of a genre.

The literary anatomy occupies a unique position in European history. Few genres receive more attention as a possible source in the formation of the early novel; yet, no satisfactory definition of the literary anatomy exists. Complicating the matter further, scholars have failed to produce a convincing genealogy of the intellectual formation and evolution of the literary anatomy through the three centuries of its influence in Europe. In large part, researchers ignore the role of medical anatomies in establishing the structural principles of the genre. Such glaring lapses in scholarship seem unlikely; however, a quick survey of existing research on the literary anatomy, including Howard Weinbrot’s recent book *Menippean Satire Reconsidered* (2005), demonstrates that most scholars have yet to recognize the benefits of a truly interdisciplinary approach.

Researchers in the History of Science have produced hundreds of volumes on the development of the anatomical sciences. These monographs, articles, and papers mostly explore the complex history of dissection as an attempt to discover the human interior. Much of this work highlights the emergence of groundbreaking texts and methodologies during the Renaissance—typified by Andreas Vesalius’ *De humani corporis fabrica* (1543)—which tend to break with traditional Galenic theories of medicine. The efforts of many historians remain centered, however, on charting theoretical and methodological changes throughout the centuries, without exploring the impact of these transitions on other disciplines.

In quite the reverse manner, literary scholars (in an indirect attempt to explain the origins of

the novel) have narrowed their focus on literary anatomies to a point that includes very specific instances of generic mergence. The sample of works treated in these examinations fails to represent the full spectrum of literary anatomies produced during the seventeenth and eighteenth centuries (most of which differ radically from the more famous examples). Foremost among the anatomies mentioned is Robert Burton's *The Anatomy of Melancholy* (1621), a hybrid work of fiction and medicine. Burton's Anatomy has enjoyed a privileged status in literary criticism because of its persistent influence on writers of the seventeenth and eighteenth centuries. Current scholarship focuses on this work as a kind of 'missing link' between ancient forms of satire and the novel, however, completely disregarding the anatomical register of Burton's organizational plan.

This project aims at uniting these two independent areas of anatomical research. Such an approach hinges on the basic assertion that the literary anatomy is first and foremost an adaptation of its medical counterpart, and thus cannot be examined apart from the generic expectations of scientific literature. In particular, I advance the claim that the characteristic by which all proper anatomies (literary or scientific) are linked is the use of systematic organization to arrange a body of knowledge. Organization in this sense corresponds to early modern understandings of the 'natural' relations between individual parts of an integrated system, like the human body. The term systematic comes to signify the attempt to identify associations between natural phenomena by combining the empirical senses with 'reason' to discover a true 'system of the world.' Anatomical organization serves as a prototype for nearly every systematic endeavor of the Enlightenment, including such ambitious projects as the universal library of Leibniz and the encyclopedic dictionaries of Chambers and Diderot.

The first chapter considers the basic social, religious, and philosophical framework of anatomical science in ancient Greece, Persia and Arabia. I begin with an examination of the

philosophical writings of the Heraclitus and Euripides' *The Bacchae* to create a lens through which one can imagine Greek tragedy as a literary expression of the ancient taboo against human dissection. Against this backdrop I attempt to explain the influence of Greek cosmology on the anatomical theory of Hippocrates and Galen. I discuss also the influence of Epicurean atomism on the first Greek 'anatomists,' Erisistratus and Herophilus.

Moving forward, I consider the near-absolute authority of the Greek medical tradition and the impact that it had on Persian and Arabic medicine. In attempting to explain the absence of human dissection in pre-Islamic and Islamic medical culture, it is necessary to reconstruct the religious and philosophical contexts of Islamic cosmology. In the process, I reveal the commanding influence of Greek and Islamic cosmology on the anatomical tradition inherited early modern Europe, and hint at the radical implications of 'institutionalized' human dissection during the Renaissance. I argue that the 'act of dissection' presents an epistemological challenge to more traditional modes of analysis, which emphasize the intellectual and spiritual value of unity.

In Chapter Two I examine Andreas Vesalius' landmark anatomical text, *De humani corporis fabrica* (1543), discussing its influence on the English physician, Helkiah Crooke (*Mikrokosmographia*, 1615), and literary figures like Robert Burton. In the process I explore the impact of systematic modes of analysis and organization on the literary aesthetics of early modern and enlightenment Europe. In particular, I argue that the basic arrangement of the literary anatomy has its origin in experimental medical anatomies of the Renaissance, which attempt to recreate the systematic structure of the human body in textualized form, using digression and cross-references to simulate the tight 'order' of physical integration.

Chapter Three sheds light on the many possible meanings of 'anatomy' during the early modern period. I revisit the topic of cosmology and discuss traditional understandings of the analogical relationship between body/universe as an expression of microcosm/macrocasm.

Pulling from a rich body of scholarship, I explore John Donne's *Anatomy of the World* and *Ignatius his Conclave* as evidence of the poetic backlash against the "Scientific Revolution" of the early Renaissance. I adopt a new position, arguing that Donne employs popular tropes from medical and astrological 'semiology' (in particular, the common 'Zodiac' or 'Anatomized' man) in an effort to subvert the expansion of mechanical world systems, maintaining instead that the universe is "semiotically given." I suggest that Donne works as a poet to establish a middle ground between two controversial viewpoints: namely, the astrological/magical worldview of ancient medicine and the emerging physical/mechanical worldview of anatomical science. As a solution to the conflict, Donne offers the metaphysical language of poetry as a replacement for the semeiological spaces created by cosmological congruence.

Chapter Four considers the relationship between anatomical literature and the novel. I continue to define literary anatomies by the organizational principles that they share with their medical counterparts. I make use of Sterne's novel, *Tristram Shandy*, to argue for the existence of an "aesthetics of dissection"—departing, in the process, from traditional interpretations of the digressive character of Sterne's structure. I situate Sterne's textual arrangement in the theoretical milieu of eighteenth-century neuroscience, citing examples from Tristram's medical biography—especially his abnormal birth—to reveal his inability to edit memory as evidence of brain damage. I argue that Tristram's digressions result from direct injury to the 'seat of memory' in his brain. In short, Sterne experiments with traditional schemes of narratological arrangement by organizing information pathologically—according to the "physical logic" of biological systems—rather than chronologically.

Finally, Chapter Five attempts to characterize the under-appreciated relationship between anatomical and encyclopedic modes of the eighteenth century. In this chapter, I attempt to classify the encyclopedia as an offshoot early modern anatomical organization. I examine

the various organizational schemes of landmark works, from Pierre Bayle's *Dictionnaire* and Ephraim Chambers's *Cyclopædia*, to Diderot *Encyclopédie*—resulting in an understanding of systematic organization as an expression of the sub-dividing modality of dissection. I look as well to Leibniz's plan for the Universal Library for evidence of a logical scheme, demonstrating in the process, fundamental ways in which encyclopedists of the seventeenth and eighteenth centuries—men trying to find their way through an emerging 'wilderness' of knowledge—look to anatomists as a paradigm of scientific analysis.

Taken together, these chapters support a central thesis about the structure of anatomy. Ultimately, I argue that the anatomy is an intellectual framework. It is, to use Goldmann's phrase, the "form of the content" (qtd. in Mayrl 13); or, as William Mayrl explains, a mental structure that organizes the "empirical consciousness of a particular group as well as the imaginary universe created by the writer" (Mayrl 13). By defining anatomy as an intellectual form, we come closer to explaining why so many dissimilar texts can be thought of as 'types'—homologies—of anatomy. Immediately we recognize that the contents of these various productions do not always bear a resemblance; however, it is possible to discern (with a great deal of work) that the form of the content emanates from a consistent intellectual source. Accordingly, this project amounts to a search for that source, and for the "functional links" between "homologous structures" that give rise to anatomia (13).

Endnotes:

¹ Wesley Smith contends that it is likely this account, taken from Letter 18 of the pseudepigraphical writings, was written by "a different author or authors than the preceding ones [10-17]" (30-31). He comments further: "[...] the author of 18-21, while getting inspiration from 17, is less interested in the Cynic drama of conversion than he is in the literary possibility of an exchange and challenge between two wise men, of whose work he knows something. If the author of 18-21 took the idea of the treatise on madness from 17, as I suspect, he dropped the notion that it was a treatise on the nature and place of the gall, because no such treatise was available to him from anywhere. But he could make a treatise by borrowing from *Sacred Disease*, as he did" (31-32).

² The second account begins after the events of letters 10-17. Democritus writes to Hippocrates in order to offer a discourse on madness. Since letter 18 builds on the events of previous letters, however, we can assume that the scene established in 10-17 remains the same.

³ *OED*, 2d ed. s.v. “anatomy.”

⁴ *OED*, 2d ed. s.v. “system.”

⁵ Modern psychology and cognitive science have revealed that the borders of the human body are less ‘evident’ and eminently more ‘escapable’ than originally thought. Still, the idea of the body as a closed system plays a major role in defining notions of the self (against the ‘other’) for much of human history.

CHAPTER ONE

THE PHILOSOPHICAL FOUNDATIONS OF THE GREEK AND ARABIC COSMO-ANATOMICAL TRADITION

Throughout the early stages of its development, the medicinal arts were barely distinguishable from philosophy. Traditional understandings of the relationship between the two disciplines generated a common platitude during the middle ages: “*philosophia et medicina duae sorores sunt,*” philosophy and medicine are two sisters (French 62). For ‘physicians’ of ancient Greece, medicine was simply the practical-end of philosophy—the praxis that emerged from a host of theories about humanity and its natural relationship to the cosmos. Even the term ‘physician’ suggests the strength of the conviction, which, as James Longrigg argues, proposed that “human beings should be regarded as products of their environment, made of the same substances and subject to the same physical laws as the cosmos at large” (Longrigg 2). Longrigg’s formulation is simply a restatement of a familiar idea: namely, belief in the existence of associations between macrocosm and microcosm. According to Longrigg, however, these correspondences were limited to physical (not metaphysical) laws. Greek philosophers sought to discover the ordering principles of the physical cosmos, from which physicians were able to treat sicknesses according to “their individual *phyeis* (natures) – that is, [...] in accordance with natural processes” (2). Longrigg’s comments are meant to highlight the rationalist background of medicine, stretching back to the earliest surviving writings of the Hippocratic Corpus. Accordingly, Hippocratic texts represent the first recognizable departure from supernatural causation, toward natural explanations for disease—for instance the influence of air on health. Longrigg is not alone in admitting, however, that a religious undercurrent remains in Greek medicine, especially as it relates to the practice (or non-practice) of dissection.

Among the many religious restrictions of ancient Greece, taboos against the desecration of

the human body are particularly strong. They find expression everywhere in Greek literature and culture, from Homer's description of Achilles' impious treatment of Hector's corpse, to Aeschylus' dismemberment of Orpheus by the Maenads. The taboo finds its most obvious manifestation in Greek prohibitions against human dissection. The reasons for the ban undoubtedly stem from a long history of Greek cosmological doctrines, the unifying element of which is a claim to "the interconnectedness of the parts" of nature that comprise the "cosmos *as an ordered whole*" (Methods 142). Man is not simply part of that order, but a perfect replica (or analogy) of the cosmos. Understandably then, two major themes of Greek philosophy and literature are expressed in the desire for order (integration) and fear over its loss (disintegration).

Hippocratic medicine defines health as a kind of balance maintained within the human body. Heavily influenced by the pre-Socratic philosopher, Heraclitus, the Hippocratic text, *Regimen*, maintains that all living things are composed of fire and water (Singer 10). With regard to health then, the author of *Regimen* remarks: "The finest water and the rarest fire, on being blended together in the human body, produce the most healthy conditions [...]" ("Regimen" 273). Belief in the balanced effect of fire and water on human health led to the formulation of the doctrine of the humors. The humors (blood, phlegm, yellow bile and black bile) correspond to the four natural qualities of fire and water, hot and cold, moisture and dryness, in various combinations. The Greeks understood the principles of bodily order as parallel to those of the macrocosm. Thus the humors are influenced by external phenomena, such as the movements of the planets, the seasons, weather, diet and exercise. The Hippocratic Corpus theorizes sickness as an imbalance of fire and water, evidenced in the "excessive" presence of one or more humors (Phillips 52). Medical treatment (or therapy) consists in the active counterbalancing of inordinate humors with correspondent materials and forces in nature, through modifications of regimen and diet. The author of *Regimen* writes:

I maintain that he who aspires to treat correctly of human regimen must first acquire knowledge and discernment of the nature of man in general—knowledge of its primary constituents and discernment of the components by which it is controlled. For if he be ignorant of the primary constitution, he will be unable to gain knowledge of their effects; if he be ignorant of the controlling thing in the body he will not be capable of administering to a patient suitable treatment (“Regimen” 227).

Noticeably then, the sum of early Greek Medicine consists in what E. D. Phillips phrases as the Heraclitean “[...] tension of opposites” (Phillips 76). Heraclitus’ influence on the theory and practice of medicine in Greece is thus immeasurable. The Hippocratic Corpus stands as a testament to the appeal of pre-Socratic philosophy in promoting an approach to health that emphasizes equilibrium in the human body. Knowledge of this philosophic connection is absolutely necessary if we wish to situate the Greeks’ complex approach to anatomy and the near absence of human dissection.

Heraclitus maintained that human order (*nomos*) is a carefully negotiated balance between *physis* (nature) and *logos* (divine law). *Nomos*, in this sense, corresponds to “political law,” as opposed to the divine *logos* (Geldard 76). In fact, we can describe *nomos* as the microcosmic parallel of *logos*; or as a mirror of the Macrocosmic Order. Heraclitus explains the relationship between *logos* and *physis* in terms that resemble the traditional conflict between fire and water in the body: namely, as an opposition, or as a contest between two orders, always in search of equilibrium in the *nomos*. The tension between *logos*, *nomos* and *physis* creates an important architecture for Greek anatomical theory, which built on the idea that *nomos* represented both the microcosmic orders of human political institutions and the human body. Just as human law parallels divine, “[m]an’s nature is but a parallel to that of the universal nature” (Singer 10). Theorized in this fashion, the body takes on a quasi-sacramental aspect, insofar as it ‘points to’ the divine order. Because the *nomos* “must be nourished by the Logos” (Geldard 76), defilement of the material body (*physis*) appears as transgression of its relation to, or harmony (*nomos*) with

the Divine Order (*logos*).

Richard Geldard maintains that Heraclitean anxieties about the relationship between *physis* and *logos* are evidenced during the Golden Age of the Greek tragic tradition (fifth century B.C.)—the period, incidentally, during which Socrates formulated the ideas recorded in the Platonic *Dialogues* (Geldard 78-79).¹ For Geldard, the plays of Euripides present a number of Heraclitus' views in dramatic form:

The law of coherent opposition, so crucial to an understanding of reality in Heraclitus, was dramatized by Euripides in the conflicts between Pentheus and Dionysus, Admetus and Alcestis, Hippolytus and Pheadra, and most famously, Jason and Medea. The result was always terrifying justice, often too overwhelming to behold (79).

'Justice' in the plays—perhaps it is more correct to say punishment—most often takes the form of bodily *disintegration*. In the case of Euripides' *The Bacchae*, audiences witness (off-stage) the ritualized spectacle of *sparagmos*. Specifically, the still-living body of King Pentheus is torn apart by frenzied devotees of Dionysus, the Bacchantes, led by Pentheus' own mother. One of the more puzzling aspects of Pentheus' death is thus its inordinate brutality. The King of Thebes stands accused of impiety toward a foreign god.² As H. D. Rankin explains, however, Pentheus' reaction to the Bacchanal is appropriate for the ruler of a city-state: "The invasion of his city by the Bacchanals is a public danger and a cause of disorder: he [...] reacts quickly to defend his city against this imminent social disease [...]" (Rankin 18). Clearly, Pentheus' mistake is rooted in some other cause.

Near the beginning of the play, Dionysus addresses the audience in an attempt to explain the actions to come. The basic offense of Thebes, and the reason for Dionysus' return, stems from the denials of his own aunts:

For I have come
to refute the slander spoken by my mother's sisters—
those who least had right to slander her.
They said that Dionysus was no son of Zeus,

but Semele had slept beside a man in love
and fathered off her shame on Zeus—a fraud, they sneered,
contrived by Cadmus to protect his daughter’s name.
They said she lied, and Zeus in anger at that lie
blasted her with lightning.

Because of that offense
I have stung them with frenzy, hounded them from home
up to the mountains where they wander, crazed of mind,
and compelled to wear my orgies’ livery (25-34).

In an action that precedes the play, Dionysus punishes the women of Thebes in a communal fashion, “Every woman in Thebes—but the women only—” (35). Dionysus uses forced exile and the implied loss of feminine virtue to teach Thebes a “lesson” for denying his divine patronage. We learn, however, that Pentheus still refuses to recognize the true identity of Dionysus (who, coincidentally, remains disguised as a celebrant throughout the play). Pentheus regards the behavior of the female Bacchantes as “mock ecstasies [...] / in honor of the latest divinity, / a certain Dionysus, whoever he may be” (218-20). Dionysus and his women followers pose a threat to the carefully constructed political order (*nomos*) of Thebes, creating the potential for a “breakdown of tabu” (Rankin 20). As king, Pentheus considers the threat severe enough to justify the use of bodily violence in defense of *nomos*, commenting: “Whoever this stranger is, aren’t such impostures, such unruliness, worthy of hanging?” (246-48); and, “By god, I’ll have his head cut off” (241)! We should note that this hint at future violence and dismemberment is the first to occur in the play. Equally important to mention is the fact that dismemberment and hanging are the tools of civil justice, not random acts of violence. Pentheus opposes the hazard of societal dissolution with the threat of bodily *disintegration*; and it is within this context of oppositions that his own violent dismemberment makes sense.

E. D. Rankin situates Euripides’ composition of *The Bacchae* amid the political turmoil of fifth-century Athens, which, he writes, was “suffering the disintegrative pressures” of revolution (Rankin 22). Rankin argues that, in a manner quite common for Greek writers of the period,

when those man-eating hounds he had raised himself
savaged him and tore his body limb from limb
because he boasted that his prowess in the hunt surpassed
the skill of Artemis.

Do not let his fate be yours (333-41).

Cadmus' words are more than mere foreshadowing of Pentheus' eventual *sparagmos*. Clearly, from his standpoint, dismemberment is an acceptable punishment for those who blaspheme against the divinity (*logos*) of the gods. The manner of Pentheus' death is predicated as a matter of form. Shortly before the event, Euripides' Chorus evokes the goddess Justice (*dike*):

O Justice, principle of order, spirit of custom,
come! Be manifest; reveal yourself with a sword!
Stab through the throat that godless man,
the mocker who goes, flouting custom and outraging god! (991-94)³

Charles Segal identifies *dike* as “the just distribution of prerogatives in an orderly system of exchange and worth” (Segal 331). In the context of the play, *dike* bridges the expanse between the justice of the gods and the lawful order (*nomos*) of human custom. As an agent of that justice, Dionysus exists between the microcosmic and macrocosmic orders, born of the human woman, Semele, and sired by the god, Zeus. In a very remarkable way then, as Segal explains, Dionysus closes the “distance between god and man” (12), while, simultaneously, demonstrating the severe difference. The rites associated with his cult countermand the nomotic order of Thebes by removing the Bacchantes from the *polis* into nature (*physis*). Consequently, the Bacchanal stands as a direct challenge to Pentheus' right to rule (*kratos*); yet, presumably, its rituals emanate from the *logos* of a god. As king, Pentheus has two courses available to him: He must accept the prerogatives of a ‘foreign’ god, or deny his divinity entirely. If he does the former, the traditional nomotic order will be dissolved and replaced by new laws and customs that acknowledge the rightful place of Dionysus in the life of the polis. If however, as Dionysus charges, Pentheus “revolts against divinity, in *me*” (45), he runs the risk of repeating Actaeon's

fate. The punishment for dismissing the rule of the gods is a complete *disintegration* of the body as physical order (*physis*). Cut off from the *logos*, *physis* cannot achieve a state of harmony with the macrocosmic order (signified by the generation of *nomos*). Unity with the macrocosm ceases and the integrity of the body dissolves.

Pentheus' death is particularly revealing of the potential for destruction. Not only is his body ripped apart by the Bacchae, even the ties of physical maternity come apart: "His own mother, like a priestess with her victim, fell upon him first"(1113-15). Spurned on by Dionysus, Pentheus' cry for recognition cannot put an end to Agave's frenzy. A messenger recounts the scene:

she seized his left arm at the wrist; then, planting
her foot upon his chest, she pulled, wrenching away
the arm at the shoulder—not even by her own strength,
for the god had put inhuman power in her hands.
Ino, meanwhile, on the other side, was scratching off
the flesh. Then Autonoë and the whole horde
of Bacchae swarmed upon him. Shouts everywhere,
he screaming with what little breath was left,
they shrieking in triumph. One tore off an arm,
another a foot still warm in its shoe. His ribs
were clawed clean of flesh and every hand
was smeared with blood as they played ball with scraps
of Pentheus' body.

The pitiful remains lie scattered,
one piece among the sharp rocks, others
lying lost among the leaves in the depths
of the forest (1125-40).

Scholars universally acknowledge a parallel between Pentheus' dismemberment and the two rites that bring the Dionysiac winter festival to its climax: the rending of a live animal-victim (scapegoat) and the consumption of its raw flesh (*omophagia*). *Sparagmos* coincides with the urge of a populace (removed from the rule of law) to release raw emotion. The Bacchanal thus serves as a suspension of the regular nomotic order of the *polis*—a reversal of the norm—during which revelers participate in a purging of "mass hysteria."

In his celebrated introduction to *The Bacchae*, E. R. Dodds reminds us as well of the

significance of the practice of *omophagia*:

[...] we can hardly dissociate the rite from the widespread belief in what Frazer called ‘the homoeopathic effects of a flesh diet’: if you tear something to pieces and eat it warm and bleeding, you add its vital powers to your own, for ‘the blood is the life’; [...] it seems likely that the victim was felt to embody the vital powers of the god himself, which by the act of ὁμοφαγία were transferred to the worshippers (Dodds xvii-xviii).

The major components of the ‘terror’ evoked by Pentheus’ death seem to hinge not only on the metaphysical implications of his dismemberment, but also on the possibility that the Bacchae consume his flesh—thereby threatening the ultimate dissolution of physical order. According to the Hippocratic author of *Regimen*, the act of consumption accomplishes two key functions, “separation” and “mixture” (“Regimen” 235). Diet has a medicinal effect on humans precisely because the elements that constitute individual foods can be separated into increasingly smaller parts, which then can be ‘mixed’ with other elements in the body to restore harmony. The author of *Regimen* argues:

The facts are these. “Becoming” and “perishing” are the same thing; “mixture” and “separation” are the same thing; “increase” and “diminution” are the same thing; “becoming” and “mixture” are the same thing; “perishing,” “diminution” and “separation” are the same thing, and so is the relation of the individual to all things, and that of all things to the individual (“Regimen” 235-37).

In short, the separation of individual existence into “diminution” constitutes a unique type of “perishing,”—for which parts lose their coherency—gradually “becoming” something else entirely in “mixture.” Consequently, the practice of *omophagia* carries physical and metaphysical implications. Not only are the elements of life and existence broken down by the processes of digestion, but—and perhaps more importantly—the Greeks believed that these components can recombine in the body to alter the composition of being (*ens*) itself.⁴ Pentheus’ death thus represents a complete destruction and dispersal of physical existence—the ultimate punishment for offending against the divine order of *logos*.

It is on these grounds, both religious and social, that we can begin perhaps to explain the

curious absence of human dissection in the Greek world. Knowledge of the human interior—derived and adapted from Egyptian texts, to which the practice of embalming gave limited insights, and from the occasional, informal autopsy—was at best fragmented in ancient Greece and full of error. E. D. Phillips writes:

Dissection was forbidden on religious grounds, largely out of respect for the dead, and was not practised even on the corpses of foreign enemies or of criminals. At most a body washed up on the seashore might be circumspectly examined, or aborted embryos and the bodies of exposed children might be cut open (Phillips 41).

Strict taboos of this sort had an obvious limiting effect on scientific analysis. As Phillips points out, however, the purposes for studying medicine among the Greeks had little to do with science, as we know it, and more to do with the practical treatment of disease. As such, the study of anatomy for “purely clinical purpose[s] seemed to be of little interest” (41). This is not to say that the Greeks abandoned their curiosity about the human interior. Rather, in what became known as comparative anatomy, the Greeks substituted the practice of human dissection with that of our closest analogue, animals. Writers of the Hippocratic Corpus thus drew their knowledge of the human body from a number of sources; however, the bulk of their anatomical descriptions derived from comparisons of, and guesses about the physical correspondences between human and animal structures.

The one exception to this rule occurred briefly during the third century B.C., in the Ptolemaic city of Alexandria. The Alexandrian School, as it is known, was the first to practice systematic dissections on human corpses for clinical purposes. Medical historians have long speculated about the reasons behind such a radical shift in attitude among the Greeks. It is known that the physicians Herophilus and Erisistratus spearheaded these efforts; yet, because none of their writings remain, the grounds for their approach continue to elude investigators. E. D. Phillips speculates that Aristotle’s philosophical teachings, which “declared that the soul [...] constituted

the purpose and value of the whole organism,” played an important role in establishing the position that “after death there was no more than a physical frame without feelings or rights” (140). As a result, Phillips argues, the practice of human dissection acquired a degree of rational justification.

A widely cited historical account of an early meeting between Hippocrates and Democritus complicates the matter further. In a collection of “pseudepigraphical” writings called the *Democritus Letters*,⁵ Hippocrates narrates the particulars of an attempt to help the Abderites discover the cause of Democritus’ supposed madness. When Hippocrates approaches Democritus he finds the philosopher sitting in a copse, near a stream, dissecting animal carcasses. Asked about his actions, Democritus explains to Hippocrates that dissection gives philosophers a specific kind of knowledge, which allows them to seek the natural origins of mental affliction in the interior structures of the body. Hippocrates is struck by the apparent sense of the argument (and the philosopher’s obvious sanity), leading to what Wesley D. Smith calls “a sudden conversion to Democritus’ point of view” (Pseudepigraphic 22).

The events portrayed in the *Democritus Letters* are, nonetheless, little more than myth (Smith 228). The true extent to which Democritus influenced Hippocrates is hard to quantify. Many of the accounts that link the two, including that of Celsus, appear to derive from the assertions of the pseudepigraphical letters (Pseudepigraphic 27). The only issue that remains to be examined centers, therefore, on the actual resemblance of the Hippocratic method to that suggested in the Democritean. On this subject, Smith writes,

Ancient Medicine proposes relating textures and shapes of organs to perceived symptoms, but systematic study of the specific relations of organs, in their size, shape and condition, to normal and pathological phenomenon came somewhat later, out of the work of the anatomists of Alexandria (Pseudepigraphic 26).

Though it is true that Hippocrates anticipates the advancements of the Alexandrian School, any

participation in its defining methodology is certainly limited to speculation. The dissections of the Alexandrian School (both animal and human) were well known across the Greek and Roman world by the first century B.C. (when the *Democritus Letters* were composed). The *Letters* thus advance a bit of revisionist history, with regard to the full extent of Hippocrates' acceptance of Democritean methodology. The fact, moreover, that the Hippocratic Corpus has numerous authors (from different periods) and, therefore, cannot be reduced to a single, homogeneous theory, need not even enter the discussion to discredit the account. The Democritean myth would continue to find an audience as far as the seventeenth century, however, in the works of Robert Burton and Helkiah Crooke, among others. I find it necessary, as a result, to return to this detail in subsequent chapters.

The content of Hippocrates' pseudepigraphical writings is still meaningful for reconstructing a history of anatomical practices in Alexandria. Democritus' role in affecting the philosophical change required to make dissection a viable mode of inquiry should not be underestimated. Division and the plurality of matter are rather important in Democritus' philosophy. Democritus, together with his teacher, Leucippus, is said to be the founder of Greek atomism. The little of what remains by Democritus comes to us from Aristotle and later writers; however, it is relatively easy to see that Democritus exercises a strong influence on Greek thought and Greek medicine.

Unlike many of the pre-Socratics, Democritus does not concern himself primarily with cosmological Unity. Missing in Democritean atomism is any sense of teleological unity. Aristotle summarizes Democritus' position as follows: "Democritus leaves aside purpose, but refers all things which nature employs to necessity" (qtd. in Curd 80). Atomism, as such, recognizes no unifying, or purposive principle, by which all matter is brought into harmony. Rather, the only indivisible unit is the atom. Every atom is, in this sense, a singularity, and not, therefore,

related to the ‘wholeness’ of the material that it composes. In other words, the only ‘force’ that holds material together is physical necessity. Democritus’ atomism is, consequently, a type of proto-Materialism. In removing teleology from its account of nature, atomism brings with it suggestions of the *desacramentalization* of matter and the body. The result of this shift surfaces in anatomical practice following Democritus’ death in the fourth century, and the birth of his successor, Epicurus, in 341 B.C.

Epicurus, of course, survives in modern consciousness as the intellectual recipient of Democritus’ teachings. Born nearly thirty years after Democritus’ death, Epicurus built on the legacy of atomism by founding a school at Athens, and eventually he eclipsed Democritus in reputation. Epicureanism continued to have a philosophical life throughout the next two millennia, exerting a strong influence in the seventeenth and eighteenth centuries. As a direct result of this fame, Epicurus’ writings have fared better than many works by philosophers of the period. A relatively large number of his teachings survived, in fact, in translation.

Diogenes Laertius tells us that Epicurus began his career as a grammarian, “but then came across Democritus’ treatises and threw himself headlong into philosophy” (Curd 3). In terms of content, Democritus and Epicurus are closely related. Plutarch remarks, “[Democritean] views are as inseparable from Epicurus’ opinions as they themselves say the shape and weight are from the atom” (qtd. in Epicurus 71). Epicurus’ main innovation lies, however, in his statement that *totality* is composed of “Bodies” and “Void.” Bodies can be divided into atoms, whose only characteristics are size, shape and weight. Atoms move around in the void, which serves only as an incorporeal matrix for physical motion. Thus Epicurus dismisses any view of incorporeality (the prevailing conception of the soul) as an active force. He explains:

But the incorporeal cannot be thought of as independently existing, except for void. And the void can neither act nor be acted upon but merely provides [the possibility of] motion through itself for bodies. Consequently, those who say that the soul is incorporeal are

speaking to no point. For if it were of that character, it could neither act nor be acted upon at all (Epicurus 17).

Epicurus does not do away with the soul, but, rather, defines it in terms of matter and motion—a belief that will resonate with René Descartes and Pierre Gassendi nearly two thousand years later.

Concerning the body then, Democritus and Epicurus provide a space for rethinking the nature of human existence, not in terms of microcosm and unity, but in terms of divisible units and physical properties. One should not be surprised to discover, therefore, that the first hint of systematic human dissection occurs almost simultaneously in Alexandria, at the great Ptolemaic medical school established around 300 B.C. Charles Singer confirms that Erisistratus, a contemporary of Epicurus and the father of modern Physiology, adopted the principles of atomistic philosophy in his practice (Singer 31). Perhaps not surprisingly, Erisistratus and Herophilus (the father of Anatomy) were rumored to have dissected human cadavers, and to have vivisected living slaves (Porter 53). It is important to remember, nonetheless, that before this point in history, all dissections were performed on animals. We may speculate, however, that the implications of atomism, and the popularity that such propositions enjoyed in the relative freedom of Alexandrian intellectual circles, temporarily lifted the taboo associated with anatomizing human corpses.

Scholars still disagree about the historicity of Herophilus and Erisistratus' vivisections. According to Singer, Galen's eventual animosity toward Erisistratus, and his inexplicable silence on the rumor of vivisection, forms the strongest evidence that human vivisection did not take place. Though Galen ascribes much of his physiological knowledge to Erisistratus' system, which he presumes came from dissection (Singer 31), acknowledging the debt did not keep him from composing *De venae sectione adversus Erisistratum*, in which Galen argues against

Erisistratus on several points concerning the structure of veins. In light of Galen's frequent attacks, Singer maintains:

Galen was extremely antagonistic to the views of Erisistratus and his followers, and devotes two books, which still exist, to their denunciation. If therefore Galen *disapproved* of human vivisection—as he did of human dissection—he would have referred to the practice by the Alexandrian anatomists had he regarded the rumours as more than mere vulgar reports. The complete silence of Galen through the hundred and twenty-seven separate works ascribed to him is thus a very impressive rebutting argument (35).

Andrew Cunningham argues, moreover, that the actual historicity of vivisection in Alexandria is ultimately not important. He reasons:

Whether Herophilus and Erisistratus had in fact engaged in the vivisection of men is, for our purposes, neither here nor there. But what does matter [...] is that there was a report that they had done so, in a Roman work of the first century AD: the *De medicina* ('On Medicine') of Celsus. [...] This account of Herophilus's and Erisistratus's predilection for the vivisection of humans, is introduced by Celsus in the midst of a critical comparison he is making of the different medical sects of his own time: the Rationalists (or Dogmatists), the Empirics, and the Methodists. Herophilus and Erisistratus are, for Celsus, in the rationalist tradition (Cunningham 23-24).

Medical historians might take exception to Celsus' use of the words "Rationalists" to describe anatomical practices at so early a stage (terms that apply more to Roman anatomists); yet one conclusion is evident: Herophilus and Erisistratus represent a break with previous anatomical traditions—a break that we can safely associate with the influence of Democritean and Epicurean atomism.

In 30 B.C., the Ptolemaic Dynasty came to an end, and with it Greek dominance of the intellectual world. Alexandria, whose importance had been waning since the deaths of Herophilus and Erisistratus, ceased to be a major contributor, as the Roman Empire absorbed Alexander's conquests. Alexandria did produce one more major figure in anatomical theory: Galen, "The Prince of Physicians." Galen was born in 129 A.D., at Pergamum (a former Ionian city in modern-day Turkey); and though he eventually lived and taught in a Rome, Galen was considered a Greek physician, having studied under Numisianus at Corinth a short while, and

later at the medical school in Alexandria (Singer 47). Galen represents the last and the most enduring major physician to emerge from the Greek world.

According to Singer's introduction to Galen's *De anatomicis administrationibus*, Galen based his anatomical knowledge largely on the comparative anatomies of apes. Singer explains:

He evidently had no difficulty in getting large numbers of them and he knew many different kinds. He advised the use of 'those most like man' and, attaching importance to the absence of a tail, preferred the Barbary ape. [...] Galen dissected many other animals also. In this book he mentions pigs, especially for experiments on the breathing and vocal apparatus and on the spinal cord, other ungulates for the brain, and one elephant (Galen xxi).

When considering whether or not Galen had first-hand knowledge of human dissection, Singer evidences a conclusion that can be drawn only by inference. On the one hand, Galen argues against human dissection; yet, Singer argues, "a number of passages [...] yield the impression that Galen knew more about human anatomy than he cared to have written down" (xxii-xxiii). Explaining Galen's hesitancy to write about human dissection, Singer contends that philosophy and religion play no part. "The objection is of no rational origin at all," he says, but aroused by more primeval feelings of "fear and disgust" toward dead bodies (xxii). Singer is not all clear, however, as to how these *feelings* are different from philosophy and religion, when the result is a cultural taboo that exerts influence equal to that of a religious conviction. Singer's distinction seems, therefore, purely semantic. The real question is whether these feelings about dissection were strong enough to deter Galen from anatomizing human cadavers. The evidence, even from Singer's standpoint, appears inconclusive.

It is clear, however, that Singer believes Galen's anatomical theory is related to some extent to his philosophical beliefs. He comments in a later work:

Following the Aristotelian principle that Nature makes nought in vain, Galen seeks to justify the form and structure of all the organs—nay, of every part of every organ—with reference to the functions for which he believes they are destined. We are thus in the presence of a work [*De usu partium*] that is not, strictly speaking, a treatise either of

Anatomy or of Physiology, but in which Anatomy and Physiology are subservient to the particular doctrine and are used to justify the ways of God to man. We have, in fact, the thesis of final causes applied to the study of the animal organism (Singer 50).

Galen's philosophy represents an affirmation of the kinds of teleological systems evidenced in both Pythagoras and Heraclitus. In part, Galen's emphasis on "final causes" helps to explain his dismissal of Herophilus and Erisistratus' atomic, material approach. Such a unifying vision of nature, determined by the purposes of God, cannot reconcile itself with stark materialism. Galen asserted, conversely, a kind of microcosmic causality, which

was a determinism of perfection in which all was fixed by a wise and far-seeing God, and was a reflection of His own perfection. That perfection can be traced in the body of man, and Galen exclaims outright that a knowledge of the uses of organs reveals Deity more clearly than any sacred mysteries (Singer 51).

Perhaps it is Galen's philosophic views that shed light on the persistence of his medical contribution. From the standpoint of anatomical description, he only summarized those who came before him (Hippocrates, Aristotle, Herophilus, Erisistratus, etc.); yet in his writings a teleological attitude to medicine reemerges just as Christianity is taking root throughout the Roman Empire. Over the next few centuries his writings were read and preserved by the Byzantines and Nestorians, in part because of an obvious appeal they had to "the Christian point of view" (Singer 51); however, it was the Syrians, Arabs and Persians that elevated Galen to the heights of fame that he reached during the early modern period in Europe. In Islam, Galen's anatomical theory found a friendly cosmological system, just as the Christian world was plunging into darkness and ignorance.

Few medical historians from the West have paid much attention to the Arabo-Islamic contribution to medicine, even though Persians and Arabs control medicinal inquiry for a period of time rivaled only by the Greeks (from pre-Islamic times, about 489 A.D., to the first European dissection in 1315 A.D.). Roy Porter devotes one sentence to Arabic anatomy in his chapter on

the body in *Blood and Guts: A Short History of Medicine*. Few historians do much better. The reason, of course, is, as Porter states: “Human dissection was not permissible within Islam” (Porter 54). Yet—and I believe this will become more evident—anatomy has as much to do with our understanding of knowledge and existence, as it does with the human interior. This was especially true in Europe, which received its anatomical tradition from Persian and Arabic physicians, despite the lack of dissection in Islamic practice. In a way, actually, I intend to argue that Islamic anatomy introduces a high level of esoteric abstraction and philosophic analysis to medicinal practice, precisely because of its divorce from human dissection; and, by way of influence, esoteric approaches become an essential characteristic of European medicine during the early modern period.

I have sub-titled this section “The Arabic Cosmo-Anatomical Tradition,” in order to put forth the following thesis: Namely, Persian and Arabic medicine, like early Greek medicine, works from the hypothesis that a relation exists between the physical and divine order. Not surprisingly, anatomical science in Islamic (and pre-Islamic) society is highly esoteric. Islam, in fact, manages to unite theology and cosmology with the natural sciences, giving rise to what many consider an alchemical (*al-kīmiyā*) system, based both on Greek sources and Qur’anic Revelation.

The idea of the “Oneness of God” in Islam is architectonic. All understanding, both scientific and theological, originates in the transcendent unicity of *Allāh*, by whom all things come into being. Islamic cosmology is, therefore, systematically preoccupied with *al-tawhīd*, or Unity. With respect to its insistence on harmony, Islam differs little from most ancient civilizations. Islamic cosmology is, in fact, based largely on the teachings of Pythagoras and his followers. According to Muslims, however, Pythagoras’ influence is not formative—in the sense that Islam originates in Greek philosophy. Rather, Islamic theologians incorporate Pythagoras (and others) for the reason that his teachings are consistent with Islamic revelation. Seyyed Hossein Nasr argues,

similarly, in *An Introduction to Islamic Cosmological Doctrines*:

The formula of Unity is the most universal criterion of orthodoxy in Islam; that doctrine may be said to be Islamic that affirms this unity in one way or other. The Prophet of Islam did not come to assert anything new but to reaffirm the truth which always was, to re-establish the Primordial Tradition (*al-dīn al-hanīf*), and to expound the doctrine of Divine Unity, a principle that is reflected in one way or another in all the traditions before Islam (Cosmological Doctrines 5).

Nasr's argument is based in both theological and philosophical supposition, which place supreme importance on the revelation of Muhammad, but acknowledging the role of rational inquiry as well. The traditions to which Nasr refers are those of the Pythagoreans and the Hermeticists. According to Nasr, the Pythagorean corpus shares profoundly in the esoteric character of alchemy—so much so that he collapses the two schools into one—which he calls “the Hermetic-Pythagorean school,” whose metaphysical approach depends on “the symbolic interpretation of phenomena” (Science and Civilization 32). The notion of symbols in both schools is an important one. Hermetic semiotics, like Pythagorean mathematics and astronomy, aims at demonstrating the unity of existence. Unity is, as Julius Evola argues, “the first principle of the true hermetic teaching” (Evola 20). The difficulty one encounters in interpreting these symbols is, of course, what gives Hermeticists and Pythagoreans their reputation as esoterics. Jung comments, with a touch of irony, that alchemy eventually “perished in its own obscurity” (Jung 227)—though, he adds, not before it dominated philosophical, chemical, and medicinal science, from ancient Greece, well into the eighteenth century (Jung 7-8).

Islamic anatomy, then, must be examined within its cosmological context. Firstly, we are dealing with a Heraclitian notion: Namely, “Nature prefers to hide” (qtd. in Geldard 157). Nature and, by extension, the body are interpreted like a sacred text—as an arrangement of hidden symbols and references to the divine order. In *Psychology and Alchemy*, Jung explains: “The real nature of matter was unknown to the alchemist: he knew it only in hints” (Jung 244); therefore,

the body must be interpreted in the same fashion as any other mysterious phenomenon in nature.

Secondly, like the approaches of Pythagoras, Heraclitus, and Galen, Islamic medicinal theory centers on the idea that the body represents a microcosm, through which the unifying principle of the Divine—*Allāh* in this case—can be examined and more-or-less understood. Both of these aspects of Islamic anatomy are consistent with the Hermetic-Pythagorean school, which Evola traces through a host of hermetic writers, from Olympiodorus to Boehme:

[...] Thus is affirmed once and for all that “man is the center in which everything winds up: the quintessence of the whole universe is locked up in him. He participates in the virtues and properties of all individuals.

But the *body* being the most concrete expression of the human entity, in hermitism the same cosmic symbols also designate the “mystery” of corporeality—and now we begin to understand that which is “nearer than any other thing,” which “all have before their eyes and at their fingertips.” Considered vile by the ignorant and held by the sages as most precious of all. [...] “That which is above is as that which is below, and that which is below is as that which is above, for the performance of the miracles of the one thing.” This is expressed in the Greek texts as: “Everything in the macrocosmos, is also in man [...]” (Evola 24-25).

For Hermeticists, consequently, the body is not reviled, as it is for the Manicheans, but made sacred by its inherent reference to the “Macrocosmos”—its conceptual (semiotic) unity with the divine order. As one of the most famous Arabic philosophers and alchemists, al-Gazali, asserts:

An important part of our knowledge of God arises from the study of our own bodies, which reveal to us the power, wisdom, and love of the Creator. [...] Man has been truly termed a “microcosm,” or little world in himself and the structure of his body should be studied not only by those who wish to attain to a more intimate knowledge of God, just as close study of the niceties and shades of language in a great poem reveals to us more and more the genius of its author (al-Gazali 9).

Hermetic notions of microcosm are archetypal in their application throughout pre-Islamic and Islamic medicine. They form a cosmological filter, by which man is studied and understood with reference to the Divine. Jung, in fact, bases many of his assertions about the psychic force of archetypes on the esoteric power of alchemical symbols, treating dreams like an hermetic text. We see in Jung, furthermore, that the idea of oneness, or wholeness of being, plays an important

role. In *Psychology and Alchemy*, he explains: “I began my introduction with human wholeness as the goal to which the psychotherapeutic process ultimately leads” (Jung 27). To an extent, Jung acknowledges metaphorically what ancient Hermeticists and doctors, like Heraclitus, Galen and Hippocrates, understood cosmologically. Jungian psychology, in fact, reaffirms the idea that wholeness, psychic unity, or reference to the unifying principle, is a crucial aspect of human wellbeing. Health (*sanis*) in the ancient world is, after all, a matter of physical and spiritual balance, where the various elements, or humors are brought into material and psychic harmony. Sickness (*insanis*) represents, conversely, an imbalance in bodily, and, therefore, spiritual unity. Jung merely emphasizes the spiritual causes of sickness, which he calls the “unconscious” causes. After Descartes, alternatively, material causes are the only subject of medicine until the appearance of psychoanalysis. It is important to remember, however, that ancient Greek and Islamic physicians imagined no such distinction between physical and psychic medicine. Man is a perfect microcosm, unified in his material and spiritual constituents, like the universe in which he lives.

Charles Singer writes, after Galen “we encounter no anatomical activity for many centuries” (Singer 66). Absence of innovation in anatomical science is due, in part, to the lasting influence and authority of Galen’s work. Galen does not surrender his title as the “Prince of Physicians,” for at least another sixteen centuries. We can, nevertheless, detect further causes for the decline of anatomical inquiry.

In the late third century A.D., the library at Alexandria—where countless Greek medical texts were cached and where medical scholars met and learned—was destroyed by fire. Alexandria, already declining as a center of learning, was now made obsolete. Shortly after he defeated the Byzantine Emperor Valerian, the Persian monarch Shāpūr I founded a city in Persia, named Jundishapur (*Science and Civilization* 188). Using Alexandria as a model, Shāpūr I founded a

new school of medicine, which Nasr describes as the main “link between Islamic medicine and the older school” (Science and Civilization 31, 188). He writes:

Jundishapur rapidly became a major center of learning, especially of Hippocratic medicine. It became further strengthened after A.D. 489, when the school of Edessa was closed by the order of the Byzantine emperor, and its physicians took refuge in that city. [...] it was also here that the last philosophers and scientists of Athens took refuge when, in A.D. 529, Justinian ordered the school of Athens to be closed (Science and Civilization 189).

As a result, Persia became a major hub of medicine and philosophy decades before the birth of Muhammad (570 A.D.) and nearly a century before the *Hajira* (622 A.D.).

In the eighth century, under the direction of the Abbasid caliph, al-Manṣūr, the medical school at Jundishapur moved to the capital at Baghdad. During this period, the first major translations of Greek texts into Arabic began to appear. Among the most important of these translators is Ḥunain ibn Ishāq (810-877 A.D.), a Christian physician who studied at Jundishapur and Baghdad. The importance of ibn Ishāq rests in the number of translations that he completed, with help from the members of his school—“including 95 works of Galen into Syriac, and 99 into Arabic” (Science and Civilization 195). Along with the Arabic and Syriac versions of Galen, Arthur Arberry confirms that ibn Ishāq undertook translations of “Plato, Aristotle, Plotinus, Hippocrates, [...] Euclid, Oribasius, Paul of Aegina and many other philosophers, mathematicians and physicians” (al-Razi 2).

Bearing in mind ibn Ishāq’s contribution, translation stands as perhaps the most significant “gift” of Arabic physicians and philosophers, without whom, much of the ancient world would have been lost. In 1926, Donald Campbell compiled a list of Galenic texts that had been preserved and translated into Arabic during the classical period, and which were eventually translated again into Latin by Western writers. Campbell’s list of translated titles comprises almost the complete second volume of his work, *Arabian Medicine and its Influence on the*

Middle Ages (Campbell 13-220). He numbers the Latin translations at two hundred and seventy six; however, Campbell's estimate does not reflect the quantity of Arabic editions produced from each Greek original. Taking into consideration that Campbell only acquaints us with the number of Latin translations from Arabic versions of Galen, one can begin to marvel at the vastness of the work of translation in the early Islamic period.

Many, if not most of these translations date from the ninth century, and were produced at the *Bait al-ḥikmah* (House of Wisdom) in Baghdad. Built in 815 A.D., the *Bait al-ḥikmah* rivaled Alexandria for its ability to draw scholars and translators from around the region. Nasr comments that Baghdad scholars "translated almost the whole of Greek scientific and philosophical literature into Arabic, thus preparing the ground for the absorption of that literature by Islam" (Science and Civilization 69). Nasr claims, in addition, that so many translations were produced at the *Bait al-ḥikmah*, that "many fragments of the writings of Aristotle, of the Alexandrian philosophers, the Neopythagoreans and Neoplatonists, the Hermetic corpus, and the works of such scientists as Galen, [...] exist today only in the Arabic translations" (Science and Civilization 70).

Among Islamic thinkers and physicians, Abū 'Ali al-Husain ibn 'Abdallāh ibn Sīnā (Avicenna) is perhaps one of the greatest beneficiaries of this rich tradition of transmission and translation. In *An Introduction to Islamic Cosmological Doctrines*, Nasr dedicates nearly one hundred pages (one of three sections) to explaining the teachings of Avicenna. In terms of cosmology, Nasr positions Avicenna as one of the most influential Islamic scholars. Nasr titles one chapter on Avicenna, "The Anatomy of Being"—a heading that seems to anticipate the argument of this chapter. According to Nasr, the "anatomy of being" refers to Avicenna's division of the various manifestations of being into hierarchical categories. Explaining Avicenna's ontology, he comments:

Being in itself is the cause of all particular existents without being reduced to a genre common to all of them. Being is above all distinctions and polarizations and yet the cause of the world of multiplicity, casting its light upon the different and distinct quiddities (*māhīyāt*) of all things. Being is the reality of each thing, as it is the source of all goodness and beauty as well as the cause of all perception, the quiddities constituting no more than the limitations of being (Cosmological Doctrines 198).

In line with Neoplatonic metaphysics, Avicenna asserts that all multiplicity (of “form”) returns to unity with Pure Being (*Allāh*), from whom all quiddities emerge. Individual “beings” do not merge with the Divine in a pantheistic manner. We remain separate, but always orientated toward Pure Being in ontological dependency. Thus in an explanation similar to that of the Scholastics,

the invisible world depends for its subsistence upon the Divine Intellect, and even the physical domain can be said to be dependent not only upon God’s Will but also His Being. The existence of everything in the physical domain derives ultimately from the Divine Essence (Cosmological Doctrines 213).

Given the importance of Avicenna’s ontology in unifying the remainder of his philosophy, one expects to find theoretical expressions of his cosmological system in the medical corpus. *Al-Qānūn fī l-ṭibb* (*The Canon of Medicine*) remains Avicenna’s most important work as a physician, and as a result, the main subject of Nasr’s inquiry.

It is unfortunate that Gruner’s celebrated English translation of the *Qānūn* omits the section on Anatomy,⁶—“in favor of the first half of the *De viribus cordis*” (Canon v). We can, nonetheless, get an idea of the argument of the *Qānūn* from the included text. Avicenna begins the *Qānūn* with the following assertion:

Although some divide “medicine” into a speculative (theoretical) and a practical (applied) part, you have assumed that it is wholly speculative “because” you say “it is pure science.” But truly every science has both a speculative and a practical side. So has medicine (Canon 25).

According to Avicenna’s plan, “practice proceeds from theory” (Canon 26). He defines theory as knowledge of human existence and the origins of health, from which practice proceeds as an application of certain opinions, or principles. The human body becomes, for Avicenna, an object

of inquiry, the study of which results in the discovery of “the causes of both health and sickness” (Canon 29). Following the example of Aristotle and the Peripatetic school, Avicenna divides these causes into four categories: material, efficient, formal and final. He asserts that familiarity with the four kinds of causation (of health and sickness) “gives one *insight* into how the body is maintained in a state of health, and how it becomes ill” (Canon 31). The emphasis here is on *maintaining* health. The physician has an eye toward the future health of the patient, attempting to establish wellbeing by *foreseeing* (inferring) the causes of sickness. Prognosis becomes, as a result, a central aspect of the physician’s art—as the process of deriving *insight* from inference, of *knowing* the future of the patient’s health (*pro*: before, *gnosis*: to know), based on symptoms, or *formal* causes, rather than empirical (or pathological) knowledge of disease. In ‘*Arjuzat ‘t-tibb* (*A Poem on Medicine*), a kind of general summary of the *Qānūn*, Avicenna explains further:

There are those [signs] which warn about death and others which indicate healing. [...] The physician will be the judge of these signs because of his science; he will know if the patient ought to die and will forgo treating him; likewise, he will know if he can cure and will announce it. It is necessary for him to recognize from the very first the periods of illness and their complications, their duration [...]; he ought to strive to know the accidents which may supervene in the different periods and to foresee the crisis (Poem on Medicine).

The physician is, therefore, as much, if not more, a *prognosticator*, as he is a diagnostician. He must first foresee the *final* cause, or future outcome of sickness. Avicenna declares, similarly:

knowledge of the future serves both purposes [of the patient and the physician]—it is advantageous to the patient because it guides him along the road he should follow, and it is advantageous to the physician in showing him to excel in his art [of inferring causes] (Canon 257).

Diagnosics takes second place to prognosics, since the diagnosis benefits the patient alone. On the other hand, prognosis has the potential to improve both the patient and the physician. Avicenna’s *Qānūn* refers to diagnostics, however, as “*semeiology*.” This term suggests, of course, that the diagnostician is looking for “signs” of sickness in the body. We cannot underestimate,

therefore, the esoteric dimension of semiotics in the process of diagnosis, as opposed to prognosis, which has a more obviously “mysterious” methodology. Diagnosis is not based on empiric knowledge of pathology; this is an innovation of the Renaissance. Rather, diagnostics engages in the interpretation of signs, or the symbols of disharmony in the body, however accurately or inaccurately.

In terms of metaphysics and cosmology then, Avicenna’s medical theory upholds the crucial link between the microcosm and macrocosm. Prognosis and diagnosis, as they are practiced in the ancient and Medieval world, depend in part on information beyond the physical body itself. Knowledge of the future condition of the patient hinges, for example, on knowledge of the future state and condition of the heavens and their elements. The universe exists, for the prognosticator, as a mirror image of the microcosm (and vice versa), such that the motions of the celestial bodies form an analogue of the “motions” of the systems and organs of the body. Similarly, diagnosis relies on the physician’s ability to interpret signs: a process that suggests not an exoteric skill, but contact with knowledge of the “hidden text” (or body of symbols) that makes man an analogue of a higher reality.

Reminiscent of Heraclitus’ cosmological formulation, which we see also in Hippocrates, Aristotle and Galen, *Fire* plays a primary role in interpreting the state of health or sickness.

Avicenna states:

Fire is a simple substance, which occupies a position in higher nature than that of the other three elements—namely the hollow of the sublunary world, for it reaches to the (world of the) heavens. All things return to it. This is because of its absolute lightness. In nature it is hot and dry. The part of which it plays in the construction of things is that it matures, rarefies, refines, and intermingles with all substances. Its penetrative power enables it to traverse the substance of the air; by this power it also subdues the sheer coldness of the two heavy cold elements [earth and water]; *by this power it brings the elementary properties into harmony* (Canon 37).⁷

One’s *state* of health depends on the effect of fire (heat) on the elements of the body. Heraclitus

asserts that a dry soul is best, given that dryness represents a return to *Fire*, or harmony with the Divine Principle. Harmony in the body, as with everything else, refers, therefore, to the corresponding state between the microcosm and macrocosm, where the elements of matter return to unicity with the Divine Principle (symbolized by purification of Fire). Again, this is not oneness in a pantheistic sense (absolute singleness of being with God), but in a hylomorphic, alchemical sense. Nature becomes one with the Divine Principle, insofar as matter *refers* constantly to its original cause, Pure Being. As such, “the study of nature becomes also the study of ‘the macrocosmic Book,’ which is the counterpart of the sacred text, so that all sciences of the Universe may be considered as so many works of ‘exegesis of the cosmic text’” (Cosmological Doctrines 212).

Here perhaps we should make one last remark, with regard to Avicenna’s cosmo-anatomical theory. The *Qānūn* presents an indirect argument against the theoretical atomism of Democritus (Cosmological Doctrines 221). Atomists assert that each “body” is composed of individual units, or atoms, and that these units represent the only indivisible substances in nature. The human body is, therefore, *actually* divisible (perhaps infinitely) into its basic units, since all matter consists of atoms and void—i.e., there already exists a space between the atoms, making division *actual*, rather than possible. Against this notion, Avicenna (citing Aristotle) argues that void, or vacuum, is an impossibility (Cosmological Doctrines 220). With regard to the human being, Avicenna holds that there is no distinction between soul and body: “The body and ‘soul’ form one complete whole—one ‘single being’” (Canon 12). Metaphysically speaking, the *Qānūn* aims at unity, rather than divisibility. Atomism transgresses a major tenant in Avicenna’s cosmology: namely, the ontological unity of all created things with their Creator. *Void* suggests a lapse in that order, a space where the Unifying Principle does not exert its influence. In terms of anatomy, moreover, infinite division presents a strong argument against the absolute integratedness of

the microcosm, and, by extension, suggests the “actual” *dis*-integration of the macrocosm. Avicenna argues, conversely, “a body is always indefinitely divisible potentially but not actually” (Cosmological Doctrines 222). The mind can conceive of an infinite division of matter, but the actual conditions of existence make the division of *being* impossible. Thus, the “Anatomy of Being” is, as mentioned above, a division of the multiple manifestations of Being, with the perspective of Being as the ultimate *Unifying Principle*. We might call this process “*cosmo-anatomy*.” The Cosmo-anatomist considers the potential divisions of existence, but denies their actuality. Anatomical dissection thus has almost no importance in the Islamic cosmological scheme. For the most part, Islamic scholars were satisfied with the anatomical findings of the Greeks. They held that knowledge of the universe did not come from its *actual* division, or dissection. Rather, the cosmos reveals its secrets by means of inference, via esoteric hints about the unicity of existence.

As noted before, anatomical dissections of human beings ceased almost entirely after the questionable vivisections of Erisistratus and Herophilus in the third century B.C.. Neither the Christian nor the Muslim world accepted human dissection as a sound practice; and because the West inherited the medical tradition of the Greeks from Arabic translations, such attitudes continued to shape the study of medicine and the human body for over sixteen centuries. All of this changed in 1316 A.D., when Mondino de’ Liuzzi published his *Anatomia*, which featured dissections of the human body, based on Arabo-Galenic sources. Mondino and the Bolognese school quickly rose to prominence for introducing anatomical demonstrations to the study of Natural Philosophy. Andrew Cunningham comments:

It was in this context that the *demonstration* of anatomy on the human body—an event thus both medical and philosophical—was introduced for students of medicine. Mundinus, as professor of practical medicine trying to teach the medical doctrines of Galen, regarded anatomical knowledge as fundamental. But Mundinus was teaching this Galenic medicine within the world of a *studium*, a world unknown to Galen or Aristotle. Hence he became

aware that there was no appropriate text by Galen or Aristotle or an Arab physician for the form of anatomical demonstration he had in mind. So he created a demonstration-dissection exercise for which he had no ancient model (Cunningham 43).

Mondino's dissections took place in an anatomy theater, which he provided as a space for "public" demonstrations. These "staged anatomies," as Hillary Nunn calls them (Nunn 1ff), become an important aspect of late medieval and early Renaissance culture, as Mondino's model continues to influence medical practice in Italy and continental Europe for the next two centuries, even serving as an "introduction" to Leonardo da Vinci's anatomical studies (McMurrich 23). In da Vinci's famous drawing of "Vitruvian Man," in the *Canon of Proportions* (c.1492), we witness an empirical work, which seeks "to establish a standard for the more accurate portrayal of the human form" (104). In short, as J. Playfair McMurrich argues:

The obvious object in formulating a canon of proportions is the determination of what may be regarded as the dimensions of a standard or typical member of a given race of the genus *Homo* (109).

For a man whose reputation has long been associated with alchemy, it is ironic then that Leonardo's anatomical work stands as an example of departure from the notion of man as a microcosm, to that of man as a general system. The main motivation behind Leonardo's investigations was a desire for precision and classification. The semiotic links between body and heavens—found in Hippocrates, Galen, and Avicenna—were, for Leonardo, metaphysical digressions, and not the aim of science.

Twenty-four years after Leonardo's death in 1519, Andreas Vesalius published *De humanis corporis fabrica*. Vesalius' work represents a further departure from ancient sources (like Galen), calling for close observations of human anatomy, instead of animal dissections, which were still being performed in many places across Europe. Roy Porter notes that Vesalius' *De humanis* "bred a new climate of enquiry: ancient dogmas were challenged, and Vesalius's successors became committed observers, vying to outshine each other in new findings" (Porter 57). It is to

Vesalius' contribution, therefore, and to the influence he exerted on anatomy and the organization of information, that the next chapter turns.

Endnotes:

¹ Geldard remarks, Euripides “gave a copy of Heraclitus’ book to Socrates, who admired it and commented on its complexity and obscurity” (78).

² H. D. Rankin writes, “He was reared in Phrygia, and his cult had Asianic characteristics, especially those of wild, ecstatic ceremonies, in which the worshippers ranged the wilderness in a state of submerged individual consciousness, and in which they occasionally torn live creatures to pieces as part of their ritual (*sparagmos*) and ate them raw (*omophagia*)” (Rankin 15).

³ E.R. Dodds delivers the lines thusly: “Let Justice visible walk, let Justice sworded walk” (Dodds 201).

⁴ Hippocrates writes,

Into man enter parts of parts and wholes of wholes, containing a mixture of fire and water, some to take and others to give. Those that take give increase, that that give make diminution” (239); and “Into man there enters a soul, having a blend of fire and water, a portion of a man’s body. These, both female and male, many and of many kinds, are nourished and increased by human diet” (241).

The implication is quite clear: Diet carries with it the metaphysical capacity to restore harmony between man and the cosmos by balancing the elements of fire and water contained in the body. Animal flesh and vegetable matter have different influences on this balance; in fact, individual foods produce widely varying effects, depending on their elemental components. Most often, animal flesh must be heated to release its potential; however, in the case of *omophagia*, the flesh is consumed raw.

⁵ This is the general title given by Wesley D. Smith to letters 10-17 of the pseudepigrapha of Hippocrates. The total collection of apocryphal letters numbers twenty-three. Smith notes that most scholars agree the *Democritus Letters* were written during the first century B.C., though he writes: the “pseudepigrapha are not consistent with one another, nor are they all of a period” (Smith 216).

⁶ Nasr cites Gruner’s translation, one of the few English versions, in the bibliography to *Science and Civilization in Islam*. Gruner’s decision to omit the section on Anatomy is a poor one, especially when one considers that part of his motivation for doing so is to present the translation in large type!

⁷ Italics are mine.

CHAPTER TWO

EARLY MODERN DISSECTION AND LITERARY ORGANIZATION: THE ANATOMIES OF ANDREAS VESALIUS, HELKIAH CROOKE, AND ROBERT BURTON

Anatomical texts find a particularly receptive audience in Europe toward the end of the Renaissance and beginning of the Enlightenment. K. F. Russell notes that England produced only nine books on Anatomy between 1500 and 1600. Russell goes on to comment, however, that “50 items were printed during 1600-50 but the number rose to some 230 in the second half of the century” (Russell xxi). Such an explosion of interest stems in part from Henry VIII’s acceptance of human dissection for the advancement of medical knowledge in 1540 (Singer 171). England, which had remained far behind the rest of Europe with regard to the development of the anatomical sciences, appeared ready to stake its own claim. It was not until William Harvey’s publication of *Exercitatio anatomica de motu cordis et sanguinis in animalibus* (1628), however, that England had its first ground-breaking contribution to anatomical knowledge. Russell comments, *De motu* “[...] at once placed Harvey in the forefront of anatomists and physiologists and put British anatomy on the scientific map” (Russell xxiii).

Harvey’s first-hand knowledge of human anatomy played a crucial role in the discovery of the circulatory system. He was, as we know, a student of Fabricius ab Aquapendente, who taught at the celebrated medical school in Padua. Padua was, at the time, the uncontested center of anatomical science—due in part to the reputation of its most famous anatomist, Andreas Vesalius, who published the revolutionary text, *De humani corporis fabrica*, in 1543. Thus through Aquapendente (himself a student of Vesalius), Harvey was exposed to the Vesalian model of anatomical demonstration, thereby establishing a clear line of influence between Padua and England in the late sixteenth century.

In this chapter I will examine Vesalius’ *De humani corporis fabrica* as a genre-defining

example of the anatomical mode. Using *De fabrica* as a theoretical framework, I will discuss Vesalius' influence on English anatomists Thomas Geminus and Helkiah Crook. From these examples I hope to construct a definition of anatomy (as a genre), from which a genealogy of the literary anatomy, typified by Burton's *Anatomy of Melancholy*, will emerge. Central to the argument of this chapter is the assertion that the medical anatomies of Vesalius and his followers experiment with new modes of textual arrangement, which they establish on the systematic organization of the human body itself.

Vesalius' contribution to the discipline of Anatomy, and science in general, has been the subject of countless books and articles. Most histories of modern medicine begin with the publication of Vesalius' *De humani corporis fabrica* in 1543. The reason for Vesalius' popularity can be traced to a willingness on the part of the Italian anatomist to break with certain elements of traditional medicinal theory (based in the writings of Galen and his followers), and the subsequent development of new pedagogical approaches for instructing physicians in the university, which he anchored in visual demonstrations of human dissections—both public and private.

Ancient and medieval practitioners of medicine believed that anatomical knowledge had only an ancillary value. Physicians were expected to be familiar with basic internal structures for the purposes of diagnosis and treatment; yet the idea of having a systematic understanding of the interior of the body was considered both excessive and unnecessary.¹ Traditional medical theory challenged the notion that perfect knowledge of exact internal structures was even attainable, citing the tendency of the body to change structurally once it begins to decay. Galen and his followers, as a result, approached the practice of human dissection with uncertainty, doubting the therapeutic benefit of such an extreme procedure (Carlino 127). The principle motive behind the practice of medicine is, after all, the treatment of disease; and if dissection produces no real

therapeutic advantage, the negative social and religious associations present too powerful an argument against the exercise.

In the “*Praefatio*” to *De fabrica*, consequently, Vesalius addresses the potential benefits of anatomical demonstrations before making a case for their inclusion in medical curriculae. He begins by highlighting the kinds of errors perpetuated by traditional divisions of medical knowledge from anatomical practice, which separated the duties of the physician from those of the barber-surgeon. Vesalius argues that this division of medical expertise creates an “evil fragmentation of the healing art” (Vesalius li). Successful treatment of disease, he maintains, depends on the physician’s ability to achieve a balance of medical knowledge, including doctrine, the use of medicines, and surgery [*ratio, medicaminum usus, and manus opera*]:²

Previously this study [anatomy] was uniquely pursued by physicians, who strained every nerve in the process of mastering it; but when they handed over the task of surgery to others they lost the art of dissection, and this meant that the whole of anatomy went forthwith into a sad decline. For so long as the physicians declared that the treatment only of internal afflictions was their province, they considered that knowledge of the viscera was all that they required, and they neglected the fabric of the bones and muscles, and of the nerves, veins, and arteries that permeate the bones and muscles, as if it were none of their business (Vesalius li).

In response, Vesalius positions the text of *De fabrica* as an argument against the pedagogical routines of anatomical demonstration—known as the *quodlibetarian* model—that had persisted since antiquity. “[T]hat detestable ritual,” as Vesalius calls it, involved the reading of an authoritative anatomical text (such as Galen’s *De usu partium corporis humani*) and the simultaneous dissection and demonstration of the internal structures of the cadaver, all before a crowd of curious onlookers. Specialized individuals carried out the various responsibilities of the ‘demonstration.’ The recognized authority of the proceedings was the physician, who, as the *lector* read *ex cathedra* from a Latin text. The *ostensor*, perhaps a professor or medical student, used a *radius* to demonstrate a particular part of the body; and lastly, the *sector*, most often an

uneducated barber, made the actual incision (Carlino 11). Because physicians never actually participated in these dissections, except in a perfunctory manner, Vesalius condemned the practice, complaining:

one group performs the actual dissection of a human body and another gives an account of the parts: the latter aloft on their chairs croak away with consummate arrogance like jackdaws about things that they have never done themselves but which they commit to memory from the books of others or which they expound to us from written descriptions, and the former [the barbers] so unskilled in languages that they cannot explain to the spectators what they have dissected but hack things up for display following the instructions of a physician who has never set hand to the dissection of a body but has the cheek to play the sailor from a textbook. So the teaching in our colleges is all wrong, and days are frittered away in ridiculous inquiries; a butcher in shambles could teach a practitioner more than the spectators are shown amidst all this racket (Vesalius li).

From Vesalius' standpoint, *quodlibetarian* demonstrations have little or no pedagogical value. Without doubt, barber-surgeons knew more about the interior structures of the human body than physicians, who relied more on the authority of writers like Galen for their anatomical knowledge than observation. Vesalius is quite adamant about the importance of direct knowledge, highlighting the importance of experience, and, as a result, de-centering the text of the *quodlibetarian* model. He goes to great lengths to reveal errors in Galen, whom Vesalius claims never performed dissections on a human body, but relied on the analogous structure of apes for his anatomical knowledge (Vesalius liv). Vesalius thereby presses the position that such errors exist only because ancient physicians lacked sufficient acquaintance with human dissection. *De fabrica* is, as a result, an attempt to reform medical knowledge around the authority of personal observation, as opposed to textual precedent.

Vesalius' rejection of "*aliorum libris*" (other books of anatomy, or books in general) is rhetorical. *De fabrica* is a work deeply concerned with its own print identity. Vesalius is said to have overseen most aspects of its production, including the creation and arrangement of 171 woodcut illustrations, which supplement the text. *De fabrica* is unique precisely because

it reflects the vigor of Vesalius' reforming energy, which gave rise to innovative organizational structures that collaborate with new print technologies. Vesalius recognized that one of the problems with earlier anatomical texts, including those of Berengario da Carpi and Mondino di Liuzzi, was the difficulty faced by a student or professor trying to identify internal structures during a dissection, based solely on anatomical descriptions.³ [FIGURE 2.1] The *quodlibetarian*

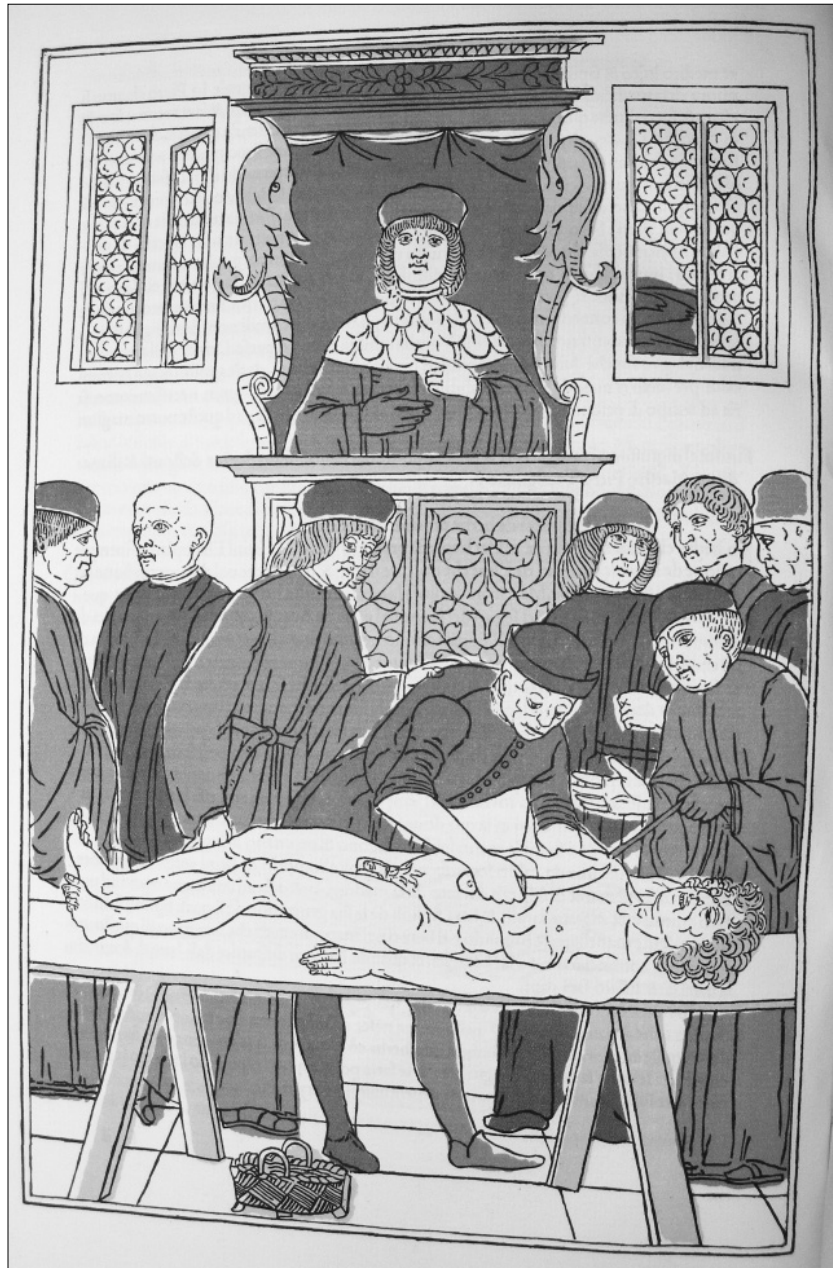


FIGURE 2.1. Depiction of the *quodlibetarian* demonstration from *Fasciculus di Medicina* (1493). Image courtesy History of Science Collections, University of Oklahoma Libraries.

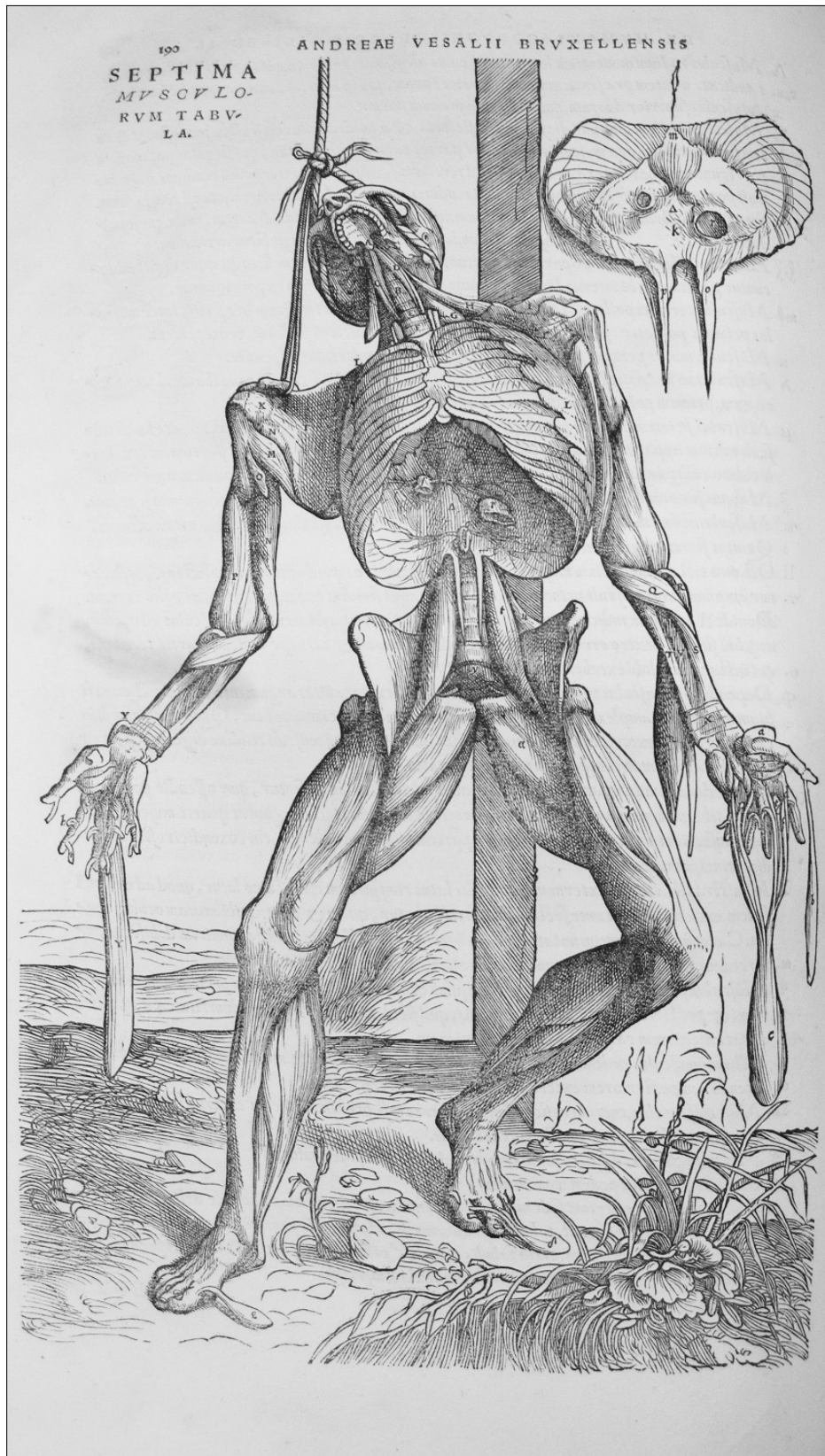


FIGURE 2.2. Cross-referenced illustration from Vesalius' *De humani corporis fabrica* (1543). Image courtesy History of Science Collections, University of Oklahoma Libraries.

model made the dilemma worse by creating a gulf between the dissector and physician.

Most anatomical textbooks of the Middle Ages and early Renaissance lacked illustrations of the human body, primarily because such illustrations were nearly impossible to reproduce in hand-written manuscripts. The limited illustrations that did adorn some volumes were borrowed most often from earlier volumes, thereby perpetuating the same tendency toward error and inaccuracy that plagued traditional texts. Added to this problem was that of reliable reproductions, since each illustration had to be re-drawn for each copy. In an attempt to remedy this concern, Vesalius—taking advantage of contemporary print technologies—commissioned an unprecedented number of woodcuts to complement his text, cross-referencing illustrations with anatomical descriptions in a systematic fashion. [FIGURE 2.2] He worked closely with the artists of Titian’s workshop to produce accurate representations of the internal structures of the body—many for the first time—providing the best available images of human anatomy. Collaboration between anatomist and artist was uncommon during the early history of book culture. It appears that Vesalius was among the first authors to appreciate the significance of new print techniques, which promised to enhance the ability of a text to express and communicate “knowledge to its full potential” (Carlino 39).

In explaining the organizational scheme of *De fabrica*, Vesalius uses the Latin word *ratio*, or system, to signify the scope of the information that he wished to circumscribe. Though *De fabrica* is a book concerned primarily with the internal composition of the human body, Vesalius tries to situate anatomy within a larger intellectual sphere, arguing:

[...] the most calamitous result of this unfortunate division of the means of treatment amongst a variety of artisans has been that it has inflicted a deplorable and most disastrous shipwreck upon the study of anatomy. Anatomy is an important part of natural philosophy; to it, since it embraces the study of man and must properly be regarded as the prime foundation of the whole art of medicine and the source of everything that constitutes it, Hippocrates and Plato attributed such importance that they did not hesitate to ascribe to it first place among the component parts of medicine (Vesalius l-li).⁴

Vesalius considers the loss of anatomical expertise crippling to any system of medicine (Vesalius 1), and here one recognizes the source of his disgust for traditional divisions of the medical art among its various specializations. A system of medicine must be integrated if it is to achieve its goal of curing the sick. The attempt to define such a system involves, for Vesalius, a complete description of the healing arts, not just anatomy. Removing the study of anatomy from the ‘system’ creates an opportunity for misdiagnosis and maltreatment.

By implication then, Vesalius’ specific use of the word *system* suggests that ‘knowledge’ and the body are homologous structures. Bodies of knowledge can be organized systematically if one can only discern the interconnections between disparate parts. Systems exist, at least theoretically, by means of the internal relation (*ratio*) of information. Vesalius regards knowledge of anatomy as part of a larger system of natural philosophy, envisioning anatomy itself as a system within a system, just as man is a microcosm within a macrocosm. In short, the study of the interior of the body has its place because it sheds light on the relation of man to the universe, within the context of a broader system of philosophy.

Nancy Siraisi maintains that *De fabrica* borrows this obvious teleological trajectory from Galen’s *De usu partis corpori humani*, which argues for the elect purpose of every part of the body as divinely organized—although Vesalius alters the terms and associations of Galen’s scheme (Siraisi 3). Vesalius’ notion of systems (and systems within systems) suggests, nonetheless, a kind of unity-of-knowledge in the universe. As mentioned, *De fabrica* signifies an attempt to fashion a system of human anatomy, as well as an effort to situate that arrangement within a larger system of natural philosophy. The text thus embodies the intellectual act of system creation; however, because the amount of information brought within his system was so massive, and because no typographical paradigm for such complex arrangements existed, Vesalius found it necessary to experiment with new methods of textual organization.

Prior to the publication of *De fabrica*, the textual arrangement of books relied more on the established conventions of the scriptorium than on the generic demands of specific content. From a structural standpoint, anatomical texts were hardly discernable from any other kind of book—a

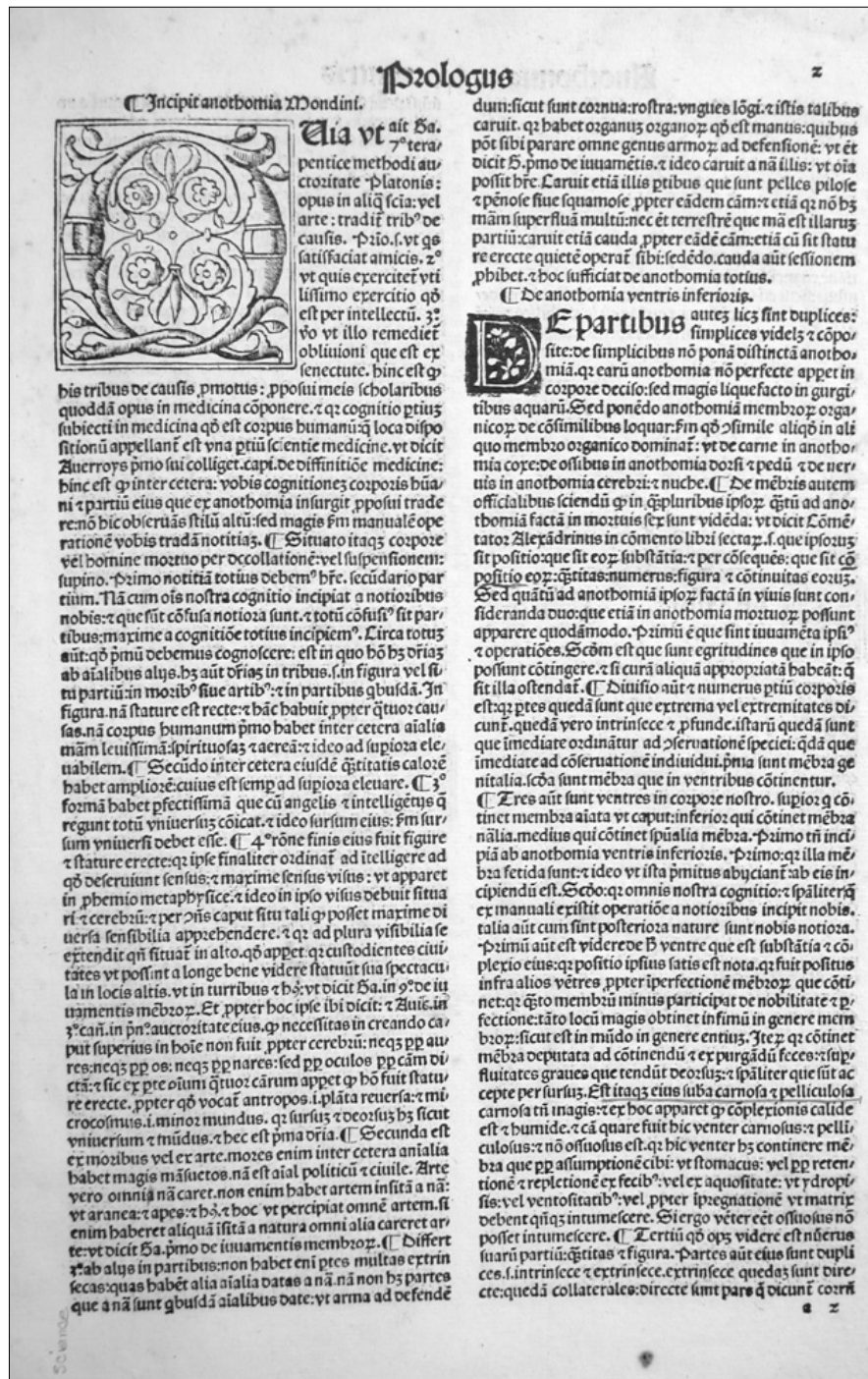


FIGURE 2.3. The 1507 edition of Mondino's *Anothomia*, demonstrating a typical layout of the text. Image courtesy History of Science Collections, University of Oklahoma Libraries.

situation that originates in the fact that incunabulae of the fifteenth century tend to mimic the scriptographical layout of medieval manuscripts (Eisenstein 23).

By the fifteenth century, anatomists had been using Mondino's *Anothomia* for demonstrations for at least a century. Mondino finished his manuscript in 1315; but the first printed edition, by Antonius Carcanus, appeared only in 1478. Carcanus's edition of *Anothomia* is rather ordinary, even for the period. [FIGURE 2.3] The layout is characteristic of early incunabulae, lacking even a title page. In fact, the only decorative choice that Carcanus seems to have made is the one to print the text in two columns (albeit the use of columns is not uncommon in the production of manuscripts). Even more conventional is Carcanus' use of a traditional gothic font, giving Mondino's work the look of austerity deemed appropriate for the genre. The end result is a book that appears overcrowded with text and encumbered with the ubiquitous abbreviation marks of Medieval Latin. *Anothomia* continues in this manner for forty-four quarto pages, with forty-four sections. Each section begins with a sub-heading that introduces the material.

Various editions of Mondino's *Anothomia* emerged over the next few decades, although little changed about the presentation of the text. If anything, some editions took several steps back toward medieval conventions. With the rise of Humanism, however, came new possibilities in print. "Antiqua," or roman type became fashionable among humanists of the fifteenth century, in part because it evoked ancient authority, but also because it read easier. Medical texts, like the 1494/5 edition of *Anothomia*, published in Venice, continued to make use of gothic type, however. The printer, Hieronymus de Durantibus, even chose to present Mondino's *Anothomia* in a single, block column, thereby increasing the difficulty one experienced in reading the text. This unfortunate arrangement continued to dominate the layout of editions through the late 1530's, with only occasional additions, such as a title-page on the 1507 edition (Pavia), and marginal notation in the 1519 edition (Genève) (Wickersheimer 51, 53, 57). For Vesalius, the

typographical conservatism of fifteenth and sixteenth-century printers symbolized the ongoing conflict between classical humanism and errant scholasticism of the middle ages. When Vesalius' *De fabrica* appeared in 1543, consequently, it represented more than a simple challenge to the perpetuated errors of anatomy. *De fabrica* launched a revolution against conventions in print culture and against typological habits that appeared to limit the freedom of an author to structure his text in accordance with an organizational scheme.

Elizabeth Eisenstein identifies this early period of printing as a moment for which the attempt to “modernize” and “rationalize” the procedures of organizing textual information represents the emergence of an “*esprit de système*” (Eisenstein 70). *De fabrica* demonstrates the actual “working-out” of such a ‘spirit,’ taking full advantage of sixteenth-century technical innovations, in order to gather and view data in a highly organized, rational form. *De fabrica* is, therefore, largely an editorial project: Vesalius’ concern for structure is governed primarily by an attempt to correct Galenic tradition. He understands, however, that such an undertaking is possible only through the accumulation and systematic organization of “all” existing knowledge, with reference always to first-hand experience of human dissection.

Fittingly, Vesalius’ organizational scheme mirrors the methodology of his subject. As an anatomist, he divides his textual material into endless sections. Unlike Mondino’s *Anothomia*, moreover, *De fabrica* is a negotiation between text and image. Vesalius’ intent was that *De fabrica* be used as a visual aid, and because of this he insisted that it include observable references for the dissector. First among these “cues” is the structure of the text itself. Vesalius divides his work into seven books—each corresponding to a system of the body: skeletal, muscular, venous, nervous, digestive (nutritional) and reproductive, cardiopulmonary, and cerebro-sensory. Each of the seven books is further separated into *capituli*, which serve to subdivide each system into its constitutive parts by function. Vesalius’ use of chapters as divisions is

not new. In fact, this arrangement is reminiscent of ancient Greek and Roman “encyclopedias,” which compiled a diversity of subjects “within the bounds of a single work” (Collison 21). Nonetheless, the idea of dividing a subject systematically, or in relation to its function within a larger scheme, is relatively unique.

As one might suspect, however, the process of “making cuts,” or sectioning a narrative can lead to a diminished sense of cohesion. In other words, the real difficulty involved in making divisions in a narrative is the resulting attempt to imagine each section as both an abstract singularity and (at the same time) an integrated component of the whole. Such abstractions occur quite often in technical works that rely heavily on the imagination to recreate the parts, or individual steps of a process. As noted above, Mondino divided *Anothomia* into forty-four sections, each corresponding to a major organ, or set of organs. Vesalius takes this systematic impulse even further. Over the course of *De fabrica*’s seven books he manages to divide the text into one hundred and eighty-eight chapters. Amazingly—and perhaps appropriately—the first two books, discussing the skeletal and muscular systems, account for one hundred and two of these sections. It is evident from the headings, moreover, that Vesalius divides his text according to the needs of an anatomist, rather than those of an editor.

The text of *De fabrica* functions as a narrative that follows the chronology of dissection from the inside out, beginning with the skeleton. Each chapter represents an individual section, or cut, of the *sector*—and, therefore, a cut deeper into (or out of) the body, or subject of the text. *De fabrica*’s narrative is not strictly linear, since the action being plotted is at times cross-spatial, just as the organs of any given system often are distributed throughout the body. This high level of spatial abstraction makes textual cross-referencing necessary. As a result, the internal structure of *De fabrica*’s narrative is a product of the opposition between its chronological and achronological elements. The text is aware of its own nonlinear organization, freely referencing

L, L Aliquot ueruebras **L** insigniuimus, nimirū in tota dorſi compage ſecundam, nonam, decimam &c. octauam & uigeſimā quartam: ita indicaturi ueruebrarum partem, ſeu ſedem, quam ipſarum corpus nuncupamus.

M, M **M** in iſſidem ueruebris uiſitur, in quibus **L** occurrit, proceſſus &c. notans in latera exporrectos, atq; ideo tranſuerſos, aut laterales nobis appellatos. Quōd uerō nō ſole ueruebræ **L** inſignite corporibus, & **M** indicatæ tranſuerſis proceſſibus donentur, neminem latere arbitror, etiam ſi ſingulas ueruebras characteribus non obruamus. Atque id etiam de ſubſequentibus notis exiſtiman dum uenit: quippe ſi quid proprij cuipiā obtigerit ueruebræ, hoc Capite id explicare haud inſtituimus.

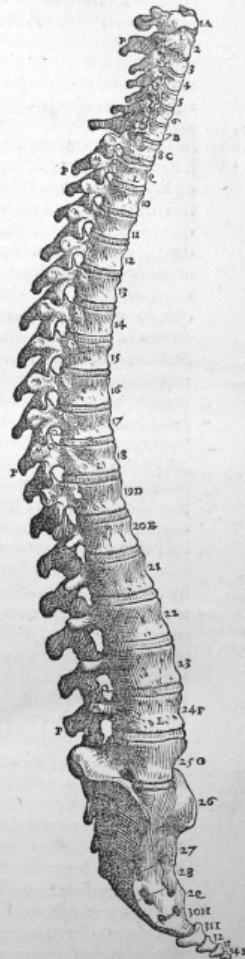
N, N **N** in octaua totius dorſi fabricæ obſeruabis ueruebra, dein in decima ſeptima, & uigeſima tertia. Notatur autem **N** quidam ueruebrarū proceſſus ad inferiora nutates, quibus ſuperiores ſeu incumbentes ueruebræ ſubditis articulantur ueruebris. Hos proceſſus ob id quōd deorſum ferantur, in orationis ſerie deſcendentes nominabimus.

O, O **O** uiſitur in ueruebris, quæ nuper cōmemoratis ſubijciuntur, indicatq; ueruebrarum proceſſus ſurſum ſpectantes, quibus ſuperpoſitæ ſubiacentibus articulantur. Hos, recte deſcendentes proceſſus nuncupabimus.

P, P **P** illis inſcribitur ueruebris, quas prius **L, M** & **O** inſigniuimus. notantur autē ueruebrarū proceſſus in corporis poſteriora exerti, & aculeo ac ſpinæ non abſimiles. Vnde etiam Græcis ἀκανθας, Latiniſ uerō ſpinæ nuncupantur. atq; hinc quoq; totam ueruebrarum compagem, ἀκανθαὶ & ſpinam uocamus. In orationis autem contextu, hos proceſſus ſerè poſteriores ueruebrarum proceſſus aut ſpinas nominabimus, totum dorſum hoc nomine rariuſ appellaturi.

Q, Q **Q** prope eaſdē reperis ueruebras, quibus poſtremo enarratos characteres inſcripſimus. **Q** nullā ueruebræ notat partem, ſed foramen in ueruebrarum conſiſtens lateribus, & neruoſ a dorſali medulla pullulatos tranſmittens. Quam uerō hoc foramen in dorſi oſtibus uariuſ ſit, in peculiari ipſorum deſcriptione pertractabitur.

R, R **R** cartilagineum notatur ligamentum, ueruebrarum corpora interueniens. quod Galenus cartilagineum puram eſſe, contra ueterum placita contendit: uerū quam recte, ſecundū libri uigeſimo ſeptimo Capite docebimus, inibi figuram propoſituri huic narrationi non inutilem, qua aliquot ueruebrarum delineantur corpora, cartilagineum hoc ligamentum, ueruebrarumq; corporum appendices, & cartilagineum quæ corpus ueruebræ ac appendicem intercedit (ut in pueris hæc ſc habent) experimentia.



In triū ſubſequentiu ca. figuris id ſi ramentū obſeruaui.

RERMENS Natura homini dorſum inſtar carinæ cuiuſdam, fundamentiq; machinata eſt. Dorſi enim opere rectū ambulare, & erectū conſiſtere ualemus. Quanquam neq; illa in hoc dorſum homini duntaxat dedit, ſed perinde atq; aliā in uniuſ membri cōſtructione, eo ad uarios ſimul uſus abuti conſueuit, ita ne hīc quoque minus induſtriam ipſius offendit. Primum enim omnibus ueruebris ad ſuorum corporum poſteriore regionem, foramen excuſpſit, idoneam dorſali medulle per ipſas

Naturæ in dorſi creatio ne induſtria. Vt id ſuſtinet. Vt dorſalis medulle uia eſt ſciatur, & in triū mobilis ſit.

tuit

FIGURE 2.4. An example of Vesalius' use of cross-referencing between text and image. Image courtesy History of Science Collections, University of Oklahoma Libraries.

and cross-referencing within its own body.

Vesalius solves many of the problems of this kind of oppositional description by creating narratological links between text and image. [FIGURE 2.4] Traditional anatomical works lacked the physicality of *De fabrica*'s “integral arrangement” (Carlino 40), relying more on textual description, which, more often than not, hid error, instead of shedding new light on the function and relationship of internal structures. Illustrations give Vesalius the freedom to compile descriptions from traditional texts, while using visual analogies to provide evidence both for and against the claims of authoritative works. This new approach added an unknown dimension to conceptualizations of the human system, and, by extension, the idea of systems in general. Elizabeth Eisenstein observes that such innovations in print technology generated a kind of “combinatory activity” between scholars and artisans, which “changed relationships between men of learning as well as between systems of ideas” (Eisenstein 48). Vesalius' alignment of textual description with the empirical evidence of illustration—thereby reducing the occurrence of error—epitomizes the “*esprit de système*,” which gave “a newfound coherence to preexisting material” (Carlino 40), and set a new standard for thinking about and representing perceivable reality.

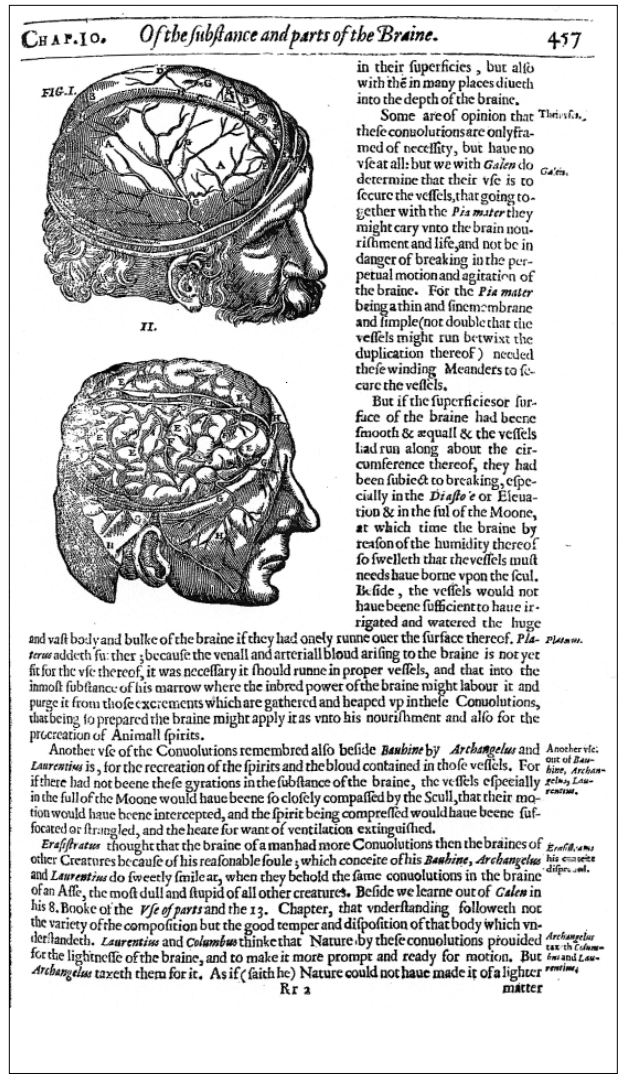
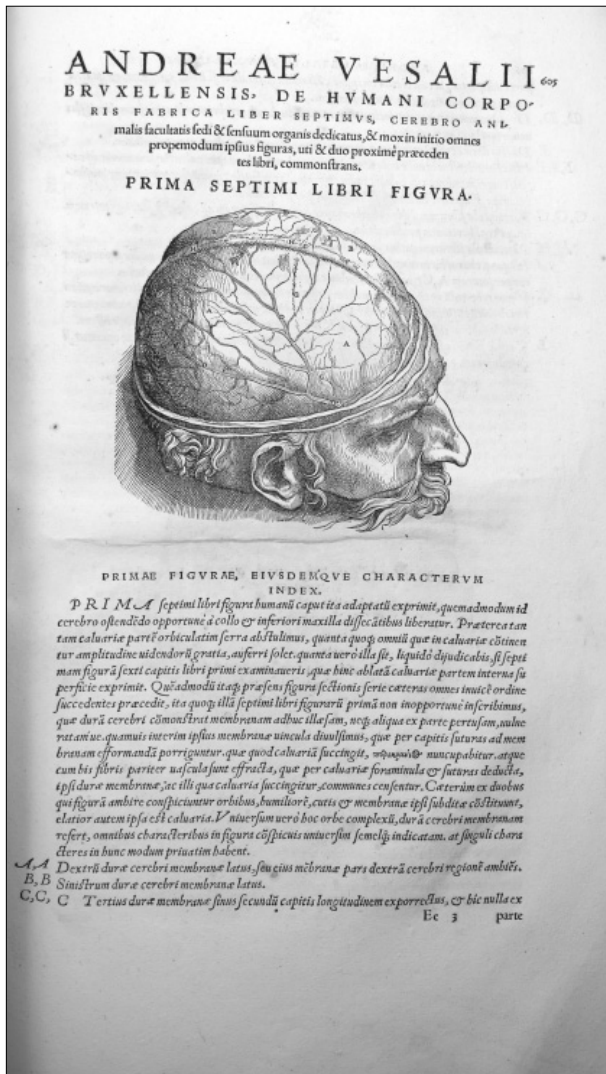
Historians often find it difficult to trace the influence of a text across geographic borders. *De fabrica* was, on the contrary, distinctively visible in England. A plagiarized version of the *Epitome* to the work appeared in England only two years after the original publication of *De fabrica*. In his bibliographic history of British Anatomy, K. F. Russell writes:

It was not long before the Vesalian plates appeared in London. In 1545 Thomas Geminus issued a plagiarized version of them under the title of *Compendiosa totius anatome delineatio* in which the name of the original author is casually mentioned in the dedication. It proved popular at once and Geminus had it translated into English in 1553 and again in 1559 (Russell xix).

Harvey Cushing speculates that Geminus—an Italian—may have worked among the engravers

commissioned by Vesalius, giving him access to the plates (Cushing 120). Whatever the case may be, Geminus' version of the *Epitome* bears little resemblance to Vesalius' original, beyond the scaled-down reproductions of his plates. Cushing points out that the text is likely compiled from Thomas Vicary's *Anatomie of the bodie of man* (1548). He credits Dr. Sanford Larkey with the discovery that Geminus' version followed traditional textual arrangements of the anatomy, beginning with a cut through the viscera, instead of starting with the skeletal system, as *De fabrica* does (Cushing 124-25). Vesalius' name appears in the dedication of Geminus' text, however, thereby solidifying the reputation of the Italian physician almost immediately.

While both Russell and Cushing appear, like most medical historians, to prioritize the emergence and influence of Vesalius' anatomical plates, the eventual arrival of the text of *De fabrica* in England and (more importantly) its system of arrangement deserves some mention. One can assume quite safely that versions of the original edition of *De fabrica* appeared in England during the late sixteenth century. Evidence for such a claim comes from the manner in which certain English anatomical texts mimic Vesalian methods of organization. K. F. Russell regards Helkiah Crooke's *Mikrokosmografia: A Description of the Body of Man* as the first example of a "comprehensive text-book in the Vesalian manner" (Russell xxii). Published in 1615, *Mikrokosmografia* exceeds other contemporary examples in the sheer scope of its subjects. Like before, Crooke's text is adapted mostly from other writers—the title-page credits Gaspar Bauhinus and Andreas Laurentius—yet, the organization structure of *Mikrokosmografia* matches Vesalius' attention to systematic detail. Crooke borrows and adapts Vesalius' illustrations, including his prolific letter-index of body parts. [FIGURES 2.5 & 2.6] Now, however, smaller versions of the images flow within the body of the text, doing away with the need to flip back and forth throughout the work.⁵ With regard to sectioning, Crooke arranges the text of *Mikrokosmografia* into thirteen books, with two hundred and ninety-four chapters. To these



FIGURES 2.5 & 2.6. On the left (2.5), an illustration of the *pia mater* from Vesalius' *De fabrica*; on the right (2.6), Crooke's reproduced version, together with an illustration of the brain after the *pia mater* has been peeled back. Image courtesy History of Science Collections, University of Oklahoma Libraries.

chapters he adds one hundred and seventy-eight "*Questions*," which, for all purposes, form additional chapters that address the controversies of the various books. Taken together, Crooke divides the text of *Mikrokosmografia* four hundred and eighty-five times.

The frequency of Crooke's divisions is no accident. Sections, or "parts," take on philosophic importance in the argument for *Mikrokosmografia*. As with Vesalius, the issue for Crooke is one of systematic arrangement—though at first the organizing principle of the text is not always apparent. Book One is compendious in its breadth of topics. Crooke moves between

subjects as dissimilar as astrology, geology, Epicurean philosophy and Christian Theology, before finally offering a definition of human anatomy in the fifteenth chapter.⁶ Reminiscent of Vesalius' argument in the preface of *De fabrica*, each of Crooke's subjects represents a single partition within a larger philosophical discussion, for which the body of man is an analogue—a microcosm of universal knowledge, as the title suggests.

The importance of Crooke's *Mikrokosmografia* has yet to be fully recognized, even by medical historians.⁷ In part this is due to the eccentric qualities of the text, which proceed from Crooke's attempts to relate every major intellectual subject to human anatomy. Recent scholarship has seemingly rediscovered *Mikrokosmografia*, if only for the reductive purpose of discussing Crooke's challenge to Aristotle's "one-sex model" (Smith 322)—thereby linking the text to rather singular examples of gender-based criticism for nearly a decade. Other scholars have pointed to the scandalous content of Books Four and Five, which describe and depict the female form in detail (and more inappropriately, in English). Of course, the content of these books was considered "quasi-pornographic" at the time, earning Crooke a censure from the College of Physicians (Sugg 113).

More importantly, Helkiah Crooke's contribution to seventeenth-century anatomy remains largely unexamined. C. D. O'Malley, in perhaps the only biography of Crooke, comments:

The *Microcosmographia* was certainly the largest and fullest anatomical work produced in England up to its day and for a considerable time to follow, but it is to be doubted that the fullness of detail was really essential for the surgeons (O'Malley 11).

Perhaps it is the "fullness of detail" that turns modern readers away from Crooke's text.

O'Malley certainly implies that readers tend to look for content that is 'essential' for the use of the text, while it is quite clear that Crooke ventures far beyond necessity. The exhaustiveness of *Mikrokosmografia* reveals a great deal about Crooke's scheme and about the logic that guides him.

Crooke's intentions for *Mikrokosmografia* become apparent in chapters fifteen and sixteen of Book One. Here, in a lengthy but important passage, he defines Anatomy, drawing an important distinction between alternate meanings of the word in the process:

Now there is amongst Physitians, a double acceptation of Anatomy; either it signifieth the action which is done with the hande; or the habite of the minde, that is, the most perfect action of the intellect. The first is called practicall Anatomy, the latter Theoretical or contemplative: the first is gained by experience, the second by reason and discourse: the first wee attaine only by Section and Inspection, the second by the living voice of a Teacher, or by their learned writings: the first we call Historical Anatomy, the second Scientificall: the first is altogether necessary for the practise of anatomy, the second is only profitable; but yet this profit is oftentimes more beneficiall then the use it selfe of Anatomy: the first looketh into the structure of the partes, the second into the causes of the structure, and the actions and uses therefrom proceeding. According to the first signification we may define anatomy thus: *An Artificiall Section of the outward and inward partes*. [...] If Anatomy be taken in the latter signification, it is defined a *science or Art, which searcheth out the Nature of every part, and the causes of the same Nature* (Crooke 26-27).

Crooke thus begins by drawing a distinction between practical and theoretical anatomy. Practical anatomy corresponds to common understandings of human dissection: namely, physical sectioning of the body into parts, and the subsequent inspection of those parts. According to Crooke, however, practical anatomy is not, by definition, systematic or even organized. He uses the word "Artificiall" to distinguish between dissections that are undertaken without a plan—such as the accidental discovery and inspection of a corpse—and dissections that are deliberate and, in some measure, organized by art or science for the advancement of knowledge (Crooke 26). The latter category of anatomies he calls "*Scientificall*," indicating the primary organizing function of reason—the very "*Science or Art*" by which all demonstrations of knowledge (anatomical or otherwise) are "framed" (Crooke 27).

Crooke claims that both modalities can be considered Anatomies because the "subject of both [...] is a Part" (Crooke 27). Thus the idea of a "Part" is key to Crooke's definition of anatomy and to his methodology. Anatomy's primary function, as both a practical and intellectual

exercise, centers on the nature of a part, both as a singular concept, and in relation to the whole.

Crooke comments:

[...] a Part is one of those things which the Logicians doe call $\tau\alpha\ \ \omega\rho\delta\varsigma\ \ \tau\iota$, that is, *have reference or respect to another*: so a part is said to bee a part of the *integrum and whole*. [...] Now whereas the part must helpe to compound the whole, it is necessary it should adheare or cleave unto it by a connexion of quantity; wherefore in the whole body, a Part hath a true existence, and is *indeed* ioyned thereto, but *in reason* devided therefrom. [...] *A part is a body cohearing or cleaving to the whole, and ioyned to it in common life, framed for his use and function*. From hence we may gather that two things are required to accomplish the nature of a Part: First, that it should cleave unto a whole, and next, that it should have some end or use (Crooke 28).

The overly philosophical character of Crooke's explanation is bewildering at first. Put in simpler terms, he argues that individual parts of the body bear an intrinsic relation to the structure of the "whole." In fact, it is this teleological relation that defines parts *qua* parts.

Still, how does one go about arranging the narration of parts? To some extent, Crooke recognizes (with Vesalius) that the demands of trying to textualize the body generate an aesthetic form—what I have called systematic structure. According to Crooke, the organization of a scientific anatomy emanates from the integrating functions of reason, which seek out the "universall or generall Theorems or Maximes, and common Notions" that define the body as an *integrum* (Crooke 27). In other words, it is the intellectual activity of integration that categorizes Crooke's "Scientificall," or "contemplative" anatomy.

As a matter of practice, however, Crooke argues that reason recognizes the "connexions" between parts only after it first understands parts as such. Put differently, that which we perceive to be "joined" in the visible "*integrum*" must "*in reason* [be] divided therefrom." Systematic organization depends, then, on the abstract dismantling of a subject, in search of certain coherences of "Structure," "Action," and "Use" (Crooke 28). Crooke's explanation helps to flush out a rather elusive notion of "system" in the Renaissance and seventeenth century, and offers a clear definition of the anatomy, first as a mode, and second as a genre.

The popular application of Vesalian methodology in England explains, to some extent, the explosion in the number of literary “anatomies” written throughout the seventeenth century. To many it became clear relatively early that the systematic structure of the anatomy provided opportunities for examining a variety of topics. As a result, many authors adopted the anatomy as a means of narrating the particulars of nearly every imaginable subject. One of the earliest examples is, of course, John Lyly’s *Euphues: The Anatomy of Wyt*.

In the dedicatory *Epistle* to the reader, Lyly draws an analogy between the actions of a surgeon and a writer, commenting:

For as every Paynter that shadoweth a man in all parts giveth every peece his just proporcion, so he that disciphreth the qualities of the mynde, ought aswell to shew every humor in his kinde, as the other doth every part in his colour. The Surgion that maketh the Anatomy sheweth aswel the muscles in the heele, as the vaines of the hart. If then the first sight of Euphues, shal seeme to light to be read of the wise, or to foolish to be regarded of the learned, they ought not to impute it to the iniquitie of the author, but to the necessitie of the history (Lyly 2v).

Lyly’s appeal to the comprehensiveness of the surgeon’s demonstration of the dissected body gives rise to notions of the literary anatomy as an “encyclopedic” genre. His explanation emphasizes the importance of each part of Euphues’ life in relation to the overall lesson of the story. Quite literally, each aspect of the journey, no matter how “light” or “foolish,” is necessary to the history, just as the demonstration of each part of the body is necessary to complete the anatomical lesson. While this is certainly true—after all, comprehensiveness is a quality of both medical and literary anatomies—Lyly ignores the fundamental issue of anatomical organization. His claim to comprehensiveness is more a posture than an actual quality of the text. Undoubtedly, Lyly’s epistolary organization earns him a thin claim as one of England’s first novelists;⁸ yet, the true capacity of anatomical systematization is far beyond the outlook of *Euphues*. If, therefore, *Euphues* represents one of the first literary anatomies, it does so in name only—or at best by analogy, as suggested by the author.

The questionable status of Lyly's *Euphues* highlights one of the more critical inaccuracies about the literary anatomy: simply having the word in the title is not enough to make a text a true anatomy. Numerous texts have aspired to imitate the anatomy without satisfying the conditions of such an endeavor. I would argue, as above, that the criteria for anatomies are three-fold: First, the abstract division of a subject into parts; second, the use of systematic organization as an integrating form to bring diverse parts together; and third, the resulting comprehensive treatment of a subject within the boundaries of the organizational structure. Comprehensiveness is, as such, only a by-product of the anatomical mode. Greater than the desire to include "everything" is the recognition that the constituent parts of "everything" must bear a recognizable relation to each other, in terms of structure, action and use. Without this primary recognition, the anatomy becomes, at best, a hodge-podge of meaningless data, and at worst the work of a madman.

It seems fitting then that one of the finest examples of the literary anatomy treats the topic of madness and melancholy. Robert Burton's *Anatomy of Melancholy* is, according to Crooke's definition, a "Scientificall," or what we might call a systematic anatomy. The *Anatomy of Melancholy* has little to do with practical dissection or the demonstration of bodily structures; rather, Burton embarks on a narrative journey, for which the primary focus is the abstract division of the constituent elements of melancholy (as a concept) and the systematic re-organization of these parts by the intellect. Having an understanding of the structure of the *Anatomy* is thus key for recognizing Burton's literary plan; however, only one scholar, Ruth A. Fox, has treated Burton's organizational structure to a book-length study.

Fox's efforts (in *The Tangled Chain*, 1976) seem directed mainly at demonstrating the logical unity of the *Anatomy of Melancholy*—an inclination that leads her to regard the work as "a single vision or "totality" of truth" (Fox 27). Fox argues that the tripartite structure of the book's partitions and their corresponding synopses imitate "the forms of scholastic treatises" (Fox 22),

which give the *Anatomy* “the marks of a *summa*” and “make the claim of totality for Burton” (Fox 24). In fact,

their very medieval, very scholastic insistence on the form of the argument suggests that he [Burton] wished us to look at his structure not only as the correct one for a treatise of melancholy, but as a way of controlling and presenting a total vision of truth about the human condition (Fox 24).

Fox shies away from claiming that Burton constructs a perfect order in the *Anatomy*. She argues instead that the synopses outlining each partition exist as “statements about the functional contexts and logical relationships in the book” (Fox 28). In particular, Fox suggests that the synopses establish connections between the “logical” narrative structure of the work and Burton’s numerous digressions. According to Fox, Burton’s numerous narrative digressions must be viewed as logical parts of the whole, and she credits the synopses with supporting such a structure: “the digressions in Partitions I and II are outlined in the synopses, and the Third Partition [...] is to be seen at the outset as part of the *Anatomy*’s single organization” (Fox 28). By looking at the synopses as visible demonstrations of the book’s logical structure, Fox contends that careful readers anticipate Burton’s digressions, thereby robbing them of their irrational relation to the text. According to Fox, the synopses pre-situate digressions within the overall sense of the work schematically.

Notwithstanding a level of truth in Fox’s observations, one still wonders: Why call the work an anatomy if the similarities between Burton’s methodology and those of the scholastics are so strong? Fox’s statements suggest that the structure of the anatomy is practically equivalent to that of the scholastic treatise. She maintains:

As we read the book, then, and turn from one partition to another, from one subsection to the next, from cause to symptom to cure, from “definite” to “indefinite” melancholy, we are following Burton in following traditional methodology (Fox 19-20).

In making this argument, Fox fails to address the anatomy *as a genre*, and as a scientific method

of organization. There are, without doubt, cosmetic similarities between the anatomy and the scholastic treatise; however, Fox does not consider (at length) the generic differences.

Without becoming overly cumbersome, I would like to examine a few issues raised by Fox on the structure of the *Anatomy of Melancholy*. Much of her argument hinges on the status of digression within the logical construction of the narration. Fox accounts for digression by citing the formal layout of the synopses, which visually incorporate each digression as a unit of the partition, in such a way that the synopses disclose the “apparatus” of the argument to the reader beforehand (Fox 21). Fox offers an example of such a synopsis from the second Partition. [FIGURE 2.7] If one looks closely at the synopses, however, it becomes evident that illustrations of the chronological order of the argument do not always make the logic clearer for the reader. Rather, the synopses function like an index, giving the reader a representational idea of structure of the partitions, without fully revealing the connections between sections. When seen in context with the preceding *Member* (titled, “the rectification of passions and perturbations - from his friends”) Burton’s digression has little to do with the ongoing line of argument (*Anatomy* II.2).

Fox borrows Panofsky’s definition of the term “Gothic” to account for detours in logic, describing partitions as individual “rooms” within the framework of the scholastic treatise, allowing for “internal change without undermining the external fabric” of the logic (Fox 27-28). Burton seems less certain about the status of his digression, however, apologizing to his audience:

[...] I have thought fit, in this following section, a little to digress (if at least it be to digress in this subject), to collect and glean a few remedies and comfortable speeches out of our best orators, philosophers, divines, and Fathers of the Church, tending to this purpose (*Anatomy* II.126).

Clearly Burton’s narrative detours bear a relation to the main argument; however, these connections are not logical—if, by which, one means syllogistic—but, rather, systematic in

nature. Digressions lead the audience to related material, but not such material that by its inclusion one satisfies the requirements of a premise in logic. The intention of the author is to be comprehensive in his presentation of information, not logical. Systematic organization is demonstrative, not persuasive.

With regard to narrative detours then, the author is forced to call them digressions because they tend to confound the reader's ability to perceive associations in the logic. Simply noting a

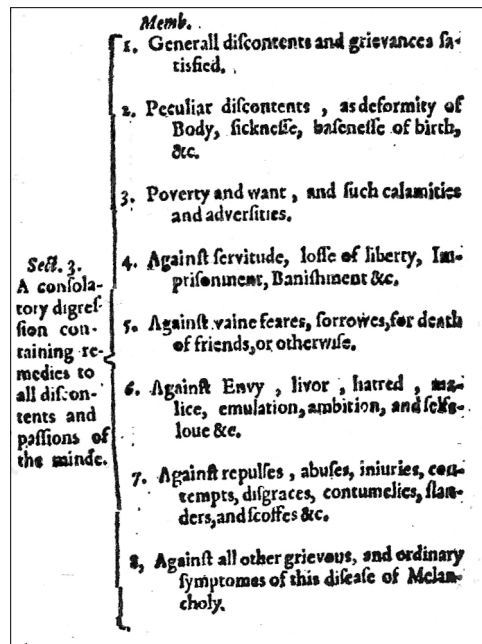


FIGURE 2.7. A diagram of Section 3 from the “Synopsis of the Second Partition.”

break in the logic beforehand—Burton calling attention in the synopsis to an obvious departure from the subject—does not really help to integrate digressions into the matrix of the argument, except representationally. Furthermore, the act of drawing brackets around a series of premises does not make them rationally coherent. One suspects, given Burton's insistence on the satirical nature of the *Anatomy*, that the inclusion of obvious failures in logic are in fact necessary.

The existence of digressions marks one main difference between the anatomy and treatise, as modalities. Whereas scholastic treatises exist as expansions on, or extensions of the logical

processes of the mind-searching-for-the-*summa*, anatomy confirms the importance of *parts*. The former is concerned only with the verifiability of the whole, the latter the demonstrability of the section in relation. As such, displaying the part, which remains hidden to the casual observer, becomes, in the hands of the anatomist, more important (or at least more artful) than proving the existence of the whole. The tasks of the scholastic and anatomist are related, insofar as they both cover the same ground: the existence of connections. In terms of method, or modality, however, scholasticism uses logic to build the *summa*; the anatomist uses dissection, or digression to cut the whole into its basic parts. The *summa* grows layer-upon-layer; the anatomy, like that of Vesalius, can be epitomized into more basic partitions—and organizing these parts has more to do with identifying connections between structures, as Crooke argues, in terms of their action and use, and less to do with the logical coherence of premises. To put it in plainer terms, the logic of systematic structure is primarily “physical,” or related to function. [FIGURE 2.8]

How then does one speak about systematic organization as an anatomical mode, if the primary impulse of the anatomist is division? Perhaps the best analogy one can offer is a similarity between the operation of narration and the function of the anatomist. Narration resembles anatomy insofar as it attempts to demonstrate the diversity of parts, in terms of chronology, action, character, etc., without a primary concern for logical constraints. In order to write an epitome of an individual life or action, the author must resort to cutting information (time, location, voice) into parts, whose only relation is functional, or bound to the goal of the artist. Narrative does not make a claim to comprehensiveness, as a modality. As with the anatomy, comprehensiveness serves a structure of recognizable, but not necessarily logical relations—creating a kind of “micro-totality” within the set border of the body, or plot, respectively. I will explore the relationship between anatomy and narrative in subsequent chapters. For now it is enough to comment that the organizational principle of anatomy differs from that of the

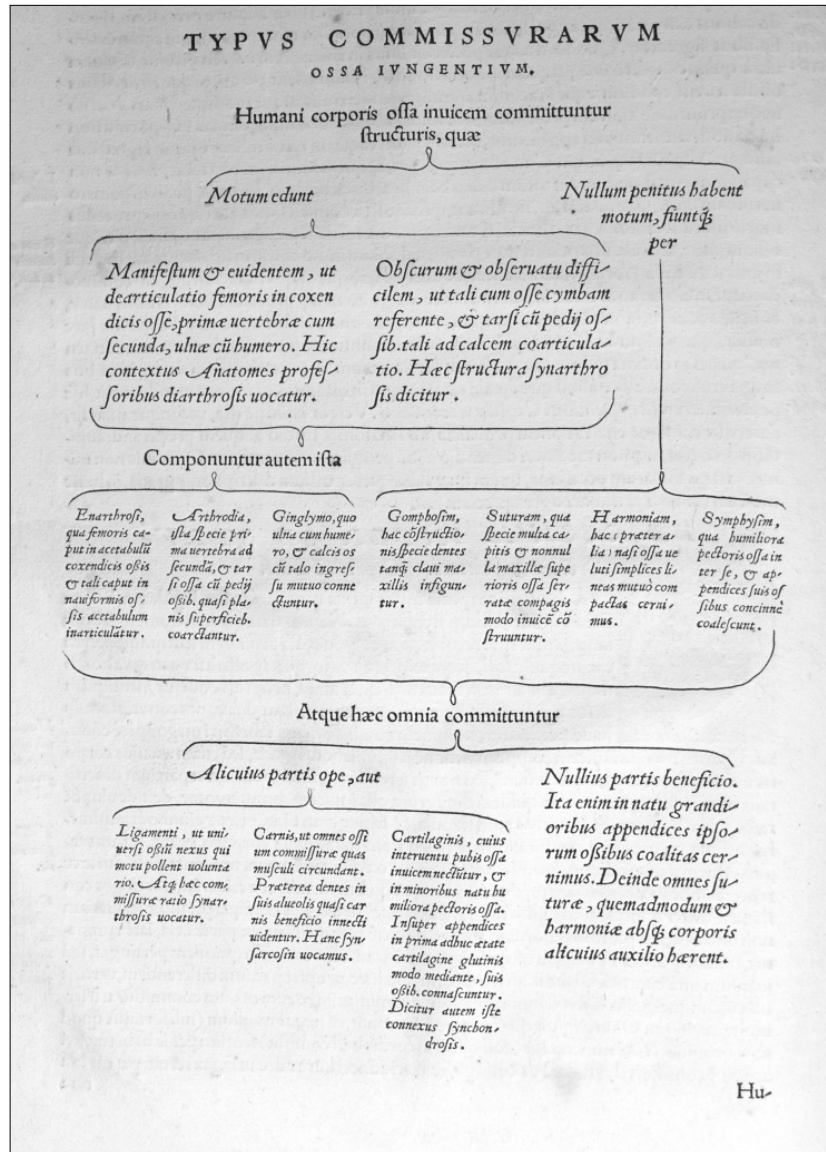


FIGURE 2.8. An example of ‘physical’ logic in *De fabrica*, where the structure of the skeleton is divided and arranged according to the action and use of the individual bones.

scholastic treatise in a fundamental way, resembling more the processes of narration than “argument.”

Getting back to Burton, one recognizes that the organization of the *Anatomy of Melancholy* has a *natural* logic to it—what I am calling physicality, or what Walter J. Ong might call “place” or “space” logics (Ong 76)—which results from the proximal and functional relation of parts in the narration. As noted above, traditional medical anatomies begin with the “first cut” of

dissection (at the abdomen) and proceed inward, dissecting parts as they go. The anatomist narrates the plot of a typical demonstration, digressing frequently as he encounters organs and structures, drawing attention to function and association. Vesalius reverses the order, beginning with the innermost skeleton—as a supporting structure—and moves outward, categorizing each part by system, or functional relationship. In both cases of narration, the plot of the anatomy follows a natural path: guided both by the physical proximity of parts, and by their action and use.

The *Anatomy of Melancholy* resembles the Vesalian anatomy insofar as Burton organizes his topic around a natural logic, avoiding the difficulties raised by syllogistic thinking. He begins the first partition with a definition of the disease itself, and then lists the natural causes, symptoms and projected course of the illness (prognostics). In the second partition, Burton discusses varied cures for melancholy, ranging from diet to pharmacological and surgical remedies. Both partitions of the *Anatomy* follow a cause-and-effect course, mirroring, in fact, the traditional narratology of medical texts before and during the period. Strictly speaking, this arrangement is not logical, as Fox would have it, but systematic: by which I mean that each section, member and partition exhibits a kind of coherence, or (in Crooke's sense)⁹ 'cleaving' between narrative parts, which relates each to the other by function—the existence of symptoms is a consequence of the disease and its cause, just as the ability to prognosticate is a consequence of the recognition and interpretation of symptoms. According to the systematic scheme then, digressions need not have a logical basis, as long as they relate to the overall function of the "part" being examined. In this way, the oft-cited "digression of the air" maintains its status as an individual—or ec-centric—part, an obvious digression from Fox's understanding of the "logic" of the partition, while functioning within the overall use of the same: namely, as a potential cure for melancholy.

One thing remains to be discussed at this point: Northrop Frye's identification of the

anatomy as an example of Menippean satire. Doubtless Burton's *Anatomy* exhibits qualities of the Menippean satire, but I would argue that Burton's plan incorporates satire without being consumed by it. Frye's misstep is of the same species as that of Fox: the hyper-critical attempt to force an equivalency between the anatomy and another modality. In a moment of what appears to be boredom with the direction of his own comments, Frye states:

We may as well adopt it [the word anatomy] as a convenient name to replace the cumbersome and in modern times rather misleading "Menippean satire" (Frye 311-12).

In doing so, *The Anatomy of Criticism* (1957) canonized the link between the literary anatomy and the creation of the British novel in the eighteenth century. Frye's assertion has been accepted almost universally; yet, when scholars attempt to trace the debt of the novel to such an enigmatic genre as the anatomy, most fail to provide convincing arguments—beyond mere cosmetic similarities. Reasons for the general confusion center, I believe, on a lack of familiarity with the anatomy itself, both as a popular literary genre, and as a tool of medical instruction. Clearly the anatomy is neither the equivalent of the Menippean satire, nor the scholastic treatise. A quick glimpse at any bibliographic catalogue reveals, contrary to Frye's assertion, hundreds of rather serious attempts in the seventeenth and eighteenth centuries at non-satiric uses for anatomies, both political and religious, in addition to the philosophical.

Scholars have shown a tendency to elevate satire to the level of a primary mode whenever they encounter it. With regard to the preceding claims, however, it seems likely that Burton wishes to make the satirical elements of the *Anatomy of Melancholy* serve the purposes of his chosen genre. Much of the confusion surrounding the status of satire in the *Anatomy* centers on Burton's choice to hide his identity (at least initially) by adopting a pseudonym in the opening epistle to the reader. He warns the reader not to expect a satire, explaining:

I would not willingly be known. Yet in some sort to give thee satisfaction, which is more than I need, I will show a reason, both of this usurped name, title, and subject. And

first of the name of Democritus; lest any man by reason of it should be deceived, expecting a pasquil, a satire, some ridiculous treatise (as I myself should have done), some prodigious tenent, or paradox of the earth's motion, of infinite worlds, *in infinito vacuo, ex fortuita atomorum collisione*, in an infinite waste, so caused by an accidental collision of motes in the sun, all of which Democritus held, Epicurus and their master Leucippus of old maintained, and are lately revived by Copernicus, Brunus, and some others. Besides, it hath been always an ordinary custom [...] "for later writers and impostors to broach many absurd and insolent fictions under the name of so noble a philosopher as Democritus, to get themselves credit, and by that means the more to be respected," as artificers usually do, *Novo qui marmori ascribunt Praxitelen suo* [...]. 'Tis not so with me ("Democritus" 15).

Burton's interest in Democritus, and the reason for adopting the diminutive form of his name, appears at first to have more to do with the philosopher's erudition than his controversial beliefs. Burton argues that Democritus is a perfect example of the kind of scholarship he wishes to pursue: "In a word, he was *omnifariam doctus*, a general scholar, a great student" ("Democritus" 16).

The next mention of Democritus occurs a few pages later, where Burton relates an account of the famous meeting between Hippocrates and Democritus.¹⁰ He writes that Hippocrates

found Democritus in his garden at Abdera, in the suburbs, under a shady bower, with a book on his knees, busy at his study, sometimes writing, sometimes walking. The subject of his book was melancholy and madness; about him lay the carcasses of many several beasts, newly by him cut up and anatomized; not that he did contemn God's creatures, as he told Hippocrates, but to find out the seat of this *atra bilis* [bile], or melancholy, whence it proceeds, and how it was engendered in men's bodies, to the intent he might better cure it in himself, and by his writings and observations teach others how to prevent and avoid it. Which good intent of his, Hippocrates highly commended: Democritus Junior is therefore bold to imitate, and because he left it unperfect, and it is now lost, *quasi succenturiator Democriti* [as a substitute for Democritus], to revive again, prosecute, and finish in this treatise ("Democritus" 19-20).

Burton credits Hippocrates with the story, citing an epistle written to Damagetus on the subject ("Democritus" 19). Bergen Evans claims that the account is "spurious" (Evans 1);¹¹ yet evidence exists about its widespread acceptance. A version of the same story appears in Helkiah Crooke's *Mikrokosmografia*, six years before the publication of *The Anatomy of Melancholy*:

After this manner, *Democritus of Abdera*, that he might finde out the seate of anger

and melancholy, cut in peeces the bodies of beasts, and when he was taxed of the Citizens for madnesse in so doing, he was by censure and determination of *Hippocrates*, adiudged to be very wise and prudent” (Crooke 12-13).

Spurious or not, Burton uses Hippocrates’ description to the same end as Crooke: to defend the usefulness of anatomical dissection, when performed in the pursuit of better medical practice.

Apparently Hippocrates’ account carries no small amount of significance for Burton, because he revisits it later in “Democritus to the Reader.” On this occasion, Burton expands the information, giving a full consideration to the conversation between Hippocrates and the philosopher. The passage is too long to quote here, though important enough to explore in part.

Burton’s second version of the story begins like the first, with Democritus reading and anatomizing animals, sitting on a stone under a tree, “without hose or shoes” (“Democritus” 48). Hippocrates appears at the request of the citizens of Abdera, who ask him to determine the cause of Democritus’ uncontrollable fits of laughter, which they take to be madness. Burton writes:

Hippocrates asked the reason why he laughed. He told him, “At the vanities and the fopperies of the time, to see men so empty of all virtuous actions, to hunt so far after gold, having no end of ambition; to take such pains for a little glory, and to be favoured of men [...] (“Democritus” 48).

For the next few pages Democritus recounts the various follies of mankind, listening at times to Hippocrates “poor” answers, only then to continue with his litany. Finally he comments:

[...] And doth it not deserve laughter to see an amorous fool torment himself for a wench; weep, howl for a misshapen slut, a dowdy sometimes, that might have his choice of the finest beauties? Is there any remedy for this physic? I do anatomize and cut up poor beasts, to see these distempers, vanities, and follies, yet such proof were better made on man’s body, if my kind nature would endure it: who from the hour of his birth is most miserable, weak, and sickly; when he sucks he guided by others, when he is grown great practiseth unhappiness and is sturdy, when old, a child again, and repenteth him of his life past. And here being interrupted by one that brought books, he fell to it again, that all were mad, careless, stupid (“Democritus” 51).

Hippocrates, convinced of Democritus’ sanity, leaves him to his work. He reports to the citizens of Abdera, “the world had not a wiser, a more learned, a more honest man, and they were much

deceived to say he was mad” (“Democritus” 51-52).

The content of the two versions of Hippocrates’ account is telling. From Crooke’s description one senses that the citizens of Abdera consider Democritus’ choice to cut “the bodies of beasts” into pieces a sign of madness; in Burton’s adaptation, the citizens find fault with the seeming insanity of Democritus’ laughter. In Crooke’s version, Hippocrates approves the use of animals for medicinal purposes; in Burton’s, Hippocrates approves of the “ironical passion” that causes the philosopher to laugh and to anatomize (“Democritus” 47). At first blush, Burton’s rendering appears to support Frye’s conflation of the anatomic and satiric modes; however, it seems possible that *The Anatomy of Melancholy* manages to pull off something more radical than a simple parody of British society. Again, evidence for such a claim centers on Burton’s choice to identify himself as Democritus Jr.

Democritus’ reputation in seventeenth-century England was rather complicated. Regarded mostly as an atomist, and perhaps more significant to this discussion, as the intellectual source of Epicurus’ philosophy, Democritus would have been an odd choice of speaker for a respected divine like Burton. The humor of such a choice would have been immediately evident to those familiar with the controversies of the day. Burton himself draws attention to the focus of these controversies in a passage cited above, linking Leucippus, Democritus, and Epicurus with the cosmological theories of “Copernicus, Brunus, and some others.” Copernicus published *De revolutionibus orbium coelestium* in 1543, the same year as Vesalius’ *De humani corporis fabrica*, though a manuscript existed and the ideas circulated for thirteen years beforehand (Copernicus 4). The fact that Burton mentions Copernicus and Bruno is curious, insofar as it signifies a connection with the resurgence of Epicureanism in the sixteenth and seventeenth centuries. Bruno was of course a proponent of Copernicus’ theory and, following leads in Copernicus’ reasoning, freely speculated about the possibility of ‘infinite worlds’—a popular

theme in Democritean and Epicurean atomism. For his contribution to the Copernican Revolution, Bruno was burned at the stake in 1600, twenty-one years before Burton's *Anatomy of Melancholy*.

While it may seem strange that the subjects of materialist cosmology would have been important to an anatomist, medical or otherwise, one must remember that prevailing wisdom, before Copernicus and Bruno, held man at the center of the universe, both in terms of location and importance. As I will argue in the following chapters, speculation about the infinity of worlds in the universe and the possibility of an infinite number of human races, presented a strong challenge to theories about the analogous relationship between mankind and the universe. Copernicus' "Epicureanism" (so it seemed to many at the time) received condemnation from Catholic and Protestant alike.

Helkiah Crooke undoubtedly had this controversy in mind when he titled his work. The opening chapters of his anatomy digress from the topic (the physical body of man and its parts), speaking directly to the Epicurean debate:

[L]et that beastly *Epicure* now lay his hands upon his mouth, & keepe silence, who was not ashamed to affirme, that the bodies of men were made by chance and fortune, out of a turbulent concourse (forsooth) of a number of Atomies or Motes, such as we see in the Sunne (Crooke 8).

In contrast with Epicurean atomism, Crooke offers a "Meterology" of this "Little worlde [...], which we call Man" (Crooke 8). He recalls traditional cosmology, figuring man as a microcosm of the universe:

Wilt thou see in this *Microcosme* or little world, the wandering Planets? The moyst and watrie power of the Moone, is resembled by the streaming marrow and pith of the back & braine. The power of *Venus* is proportioned in the generative parts: To *Mercurie* so variable, and withall so ingenuous, the instruments of eloquence and sweet delivery are answerable. Of the Sun and the heart, the admirable proportion and agreement, we have already declared. To the benevolent and beneficial Starre *Iupiter*, the Liver of man, the well-spring of most sweete and grateful humors is fitly compared. The fire and fury of *Mars*, the little bladder of the gaul gathers into itself. The cold and harmful Starre

Saturne, that loose and flaggy flesh of the Spleene, being the receptacle of melancholike humors, dooth lively resemble. And thus in like numbers, and equall proportion, both Arithmetically and Geometrically, so these Celestiall particles (as they are termed) of either worlde, the greater heaven, and the lesser of man, answer one another. The xii. signes of the Zodiacke, by the Astrologers elegantly depicted in the body of man, I passe over with silence: for these are things ancient and commonly known, as being sung in the corners of our streets [...] (Crooke 7).

Reminiscent of the almanacs of his age,¹² Crooke finds analogues between the parts of the human body and the parts, or “particles” of the heavens. The cosmological digressions of Book I function as a ground for the rest of his anatomy, allowing Crooke to demonstrate the “dignity of Man” (Crooke 10), in contrast to the Epicurean idea that man’s existence results from a series of accidents.

Seen in this light, the structure of Burton’s *Anatomy of Melancholy* is not dissimilar to Crooke’s. In fact, the infamous subsection “Air rectified. With a digression of the air” now takes on new significance. This oft-cited division concerns itself primarily with meteorology and the movement of the earth. Burton explores the many causes behind differences in climate and the effects that such variations have on health. His discussion is encyclopedic, ranging over the contributions of major and minor writers on the subject, such as Kepler, Bruno, Brahe, Copernicus, Galileo, Pythagoras, and many others. As Burton reviews the theories expounded by each of these philosophers and scientists, he notes difficulty in reconciling the differences between their proposed “systems.” At long last (perhaps inevitably) he comes face-to-face with the issue of “infinite worlds.” Burton comments:

We may likewise insert with Campanella and Brunus that which Pythagoras, Aristarchus Samius, Heraclitus, Epicurus, Melissus, Democritus, Leucippus maintained in their ages: there be infinite worlds, infinite earths or systems, *in infinito aether* [...]. For if the firmament be of such an incomparable bigness as these Copernical giants will have it, *infinitum, aut infinito proximum* [infinite, or very nearly infinite], so vast and full of innumerable stars, as being infinite in extent [...]. If our world be so small in respect, why may we not suppose a plurality of worlds, those infinite stars visible in the firmament to be so many suns, with particular fixed centres; to have likewise their subordinate planets, as the sun hath his dancing around him? Which Cardinal Cusanus,

Walkarinus, Brunus, and some others have held, and some still maintain (Anatomy II.54-55).

Burton appears at first to accept the idea of “infinite earths” and infinite “systems;” yet, the sheer number of contrasting theories of the universe and the “prodigious paradoxes” (Anatomy II.56) brought forward by the debate rapidly overwhelm him. The encyclopedic nature of Burton’s meditation generates an intellectual crisis, insofar as the author is not able to rectify the “air” (the proposed function of the section in the title), because he cannot foster consensus among the theorists. Thus, the first hint of a problem arising from the existence of infinite “systems” becomes evident in Burton’s inability to reconcile paradoxes within a ‘body’ of knowledge. He writes, sarcastically:

[...] to avoid these paradoxes of the earth’s motion (which the Church of Rome hath lately condemned as heretical, as appears by Blancanus’ and Fromundus’ writings) our latter mathematicians have rolled all the stones that may be stirred: and, to solve all appearances and objections, have invented new hypotheses, and fabricated new systems of the world, out of their own Dædalian heads. [...] and so, *Dum vitant stulti vitia in contraria currunt* [while they run away from one vice, they foolishly fall into the opposite one], as a tinker stops one hole and makes two, he corrects them and doth worse himself, reforms some and mars all. In the meantime, the world is tossed in a blanket amongst them, they hoist the earth up and down like a ball, make it stand and go at their pleasures: one saith the sun stands, another moves; a third comes in, taking them all at rebound, and, lest there should any paradox be wanting, he finds certain spots and clouds in the sun, by the help of glasses [...] (Anatomy II.56-57).

Burton’s objections to the efforts of mathematicians are twofold: first, he likens their conjectures about the movement of the earth to the ill-fated flight of Daedalus, who drifted too close to the sun and plunged back to the earth. He then compares the mathematicians to ill-sighted (or perhaps singularly focused) “Cyclopes,” who wish to “transcend spheres, heaven, stars, into the empyrean heaven; soar higher yet, and see what God Himself doth” (Anatomy II.58). Burton’s choice of ancient metaphors demonstrates both the folly and fanaticism of the ‘new science,’ which must first destroy the universe in order to “repair,” or explain it.

Of more significance, I believe, is Burton’s implication that the result of the conflict between

these man-made systems and the infinite number of paradoxes¹³ that they generate, is a complete collapse in man's confidence about what is *knowable*. As new "systems of the world" emerge, each 'disproving' the viability of the last system, man's certainty about the universe (and knowledge generally) diminishes. Philosophical paradoxes, which first appear as tools for the reform of knowledge, now reveal themselves as "absurd and brain-sick questions, intricacies, froth of human wit, and excrements of curiosity" (Anatomy II.59-60). In short, Burton argues that the new epistemological mode of cosmological science (its system of knowing) causes brain-sickness. First among such illnesses of the mind is, of course, melancholy, leading Burton to observe: "to this cure of melancholy, amongst other things, the rectification of air is necessarily required" (Anatomy II.61). Rectification of the air signifies, in Burton's doubled sense, both a "change of air," from good to bad (Anatomy II.67), and, more abstractly, the rectification of cosmological models, resulting from a reconciliation of knowledge. Again, an analogy between the heavens and earth emerges as a fundamental worldview.

We are left wondering, however, about the function of the anatomy, as a mode, in relation to melancholy, as a subject. I would suggest, as before, the one element that ties the work together is the philosopher, Democritus. Burton offers a clue in his opening letter to the reader, citing an inspirational source, Erasmus:

we have now need of a "Democritus to laugh at Democritus"; one jester to flout at another, one fool to flee at another: a great stentorian Democritus, as big as that Rhodian Colossus (Anatomy I.52).

The description is fitting, for Democritus' work is, in a sense, both a cause of melancholy and a cure. On the one hand, the development of Democritean atomism and its resurgence in the sixteenth and seventeenth centuries plays a part in destabilizing traditional understandings of the universe and man's microcosmic status therein. The Copernican proposition of infinite worlds and infinite systems, adapted from Democritus and Epicurus, further alienates mankind from

the center of any cosmological scheme. Burton, the divine, responds to these controversies by laughing at their commonly held source. He does so primarily by choosing to write under the pseudonym Democritus Junior, in effect causing the philosopher (at least in name) to ridicule his own ideas.

In another sense, however, Democritus represents the physician who (however ironically) desires to find a cure for melancholy. To an extent, Burton elevates this aspect of Democritus' character by writing an anatomy himself. After all, Democritus performed dissections for the purpose of healing; yet here we may add another wrinkle. In the process of anatomizing melancholy, Burton is forced to participate in the kinds of activities that produce melancholy. He confesses as much in "Democritus to the Reader":

I first took this task in hand, *et quod ait ille, impellente genio negotium suscepi* [...], this I aimed at, *vel ut lenirem animum scribendo*, [or] to ease my mind by writing; for I had *gravidum cor, fædum caput*, a kind of imposthume in my head, which I was very desirous to be unladen of, and could imagine no fitter evacuation than this. Besides, I might not well refrain, for *ubi dolor, ibi digitus*, one must needs scratch where it itches. I was not a little offended with this malady, shall I say my mistress Melancholy, my Egeria, or my *malus genius* [...]? and for that cause, as he that is stung with a scorpion, I would expel *clavum clavo* [a nail with a nail], comfort one sorrow with another, idleness with idleness, *ut ex vipera theriacum* [...], make an antidote out of that which was the prime cause of my disease. Or as he did, of Felix Pater speaks, that thought he had some of Aristophanes' frogs in his belly, still crying *Brececex, coax, coax, oop, oop*, and for that cause studied physic seven years, and traveled over most part of Europe to ease himself; to do myself good I turned over such physicians as our libraries would afford, or my private friends impart, and have taken this pain (Anatomy I.21).

Burton seems to share in Democritus' ironic passion by introducing yet another paradox—with regard to his own organizational scheme this time. Burton declares a plan to heal his own melancholy, using its primary cause as an antidote—just as a physician cures a scorpion sting with scorpion venom. The sting comes, in this case, from the anatomical mode itself—the process of dissecting and dividing a concept into its abstract parts. Unlike Crooke, however, Burton fails to see an end to the anatomy. In an infinite universe, there are no natural borders

to limit scrutiny. Crooke's anatomy is confined to the borders of the body itself: bone, muscle, and skin. Crooke is able, as a result, to recognize the physical unity of his system. Burton's digressions, in contrast, lead him to contemplate the infinity of space and the subsequent infinity of systems. Scientific and philosophical uncertainties make it impossible for his anatomy to find a proper end. Burton must instead continue to cut his subject *ad infinitum*.

I argue above that Burton's *Anatomy* maintains a systematic cohesion, insofar as each section relates to the overall function of the work; but here one must concede that Burton pushes the anatomical impulse beyond the limits of utility. The centrifugal force of Burton's methodology generates endless divisions, examinations, digressions, and trials of the subject matter—so much that the reader eventually gives up on reading the text as a unified system, or aesthetic whole. *The Anatomy of Melancholy*, more than any other literary text, demands to be read/examined in pieces. Digressions become aesthetic entities, which can be (and perhaps should be) separated from the whole and read for their own value—just as individual sections of a medical text are consulted according to need. Divisions, according to Burton's methodology, represent individual *curative units*—each aimed at treating melancholy through diversion, distraction and amusement. One can allege then that the “brain-sickness” of the author finds its way into the organizational scheme—and we, the audience, must stand back and wonder at Democritus Junior's passionate dissection, and what seems like uncontrollable laughter.

Satire remains, as such, an integral part of Burton's scheme. Burton's project appears to be driven by an effort to lampoon scientific attempts at “systematizing the world” (Cope 4). He settles on the anatomy as a mode, because of its insistence on the philosophical value of the “part.” Burton is able to rely on the macrocosm/microcosm analogy again, reminding his audience: ‘what happens above, happens below.’ If the anatomist can divide human bodies on earth, the astronomer can divide celestial bodies in the heavens. In this way, Burton tweaks the

anatomical genre to suit his purposes, in effect creating a mock-anatomy. Democritus Junior becomes a dissector of ideas, rather than animals; and in the process one senses Burton's concern that things are getting out of hand. The reader finds, as his explanations of causes, symptoms, kinds, and cures of melancholy grow—as Burton extends the digressiveness of his work to include topics ranging from cosmology to love—as the text of the *Anatomy* expands with each published edition—the seemingly infinite material of Democritus Junior's dissection points to the imminent absurdity of the project. Burton's *Anatomy* can never achieve its systematic and encyclopedic ends, because the process of accumulating an infinite body of knowledge is, by definition, interminable and unsustainable.

New systems—scientific, philosophic, political, and religious—seem to appear daily during the Renaissance; and the result of such unbounded innovation is, in Burton's eyes, the creation of a newly divided universe, at the expense of the unity of the old; and as divisions grow, so too does man's melancholy, in response to a growing sense of sublimity. Burton creates the intellectual situation of the *Anatomy*, with the intention of directing his audience's attention to this paradox of infinite systems. For the *Anatomy*, an attempt to divide and encircle even the smallest part of a complete system appears humanly impossible. Ultimately, Burton's *Anatomy* suggests (playfully) that mankind's inability to *complete* an act of systemization is, in its futility, a major cause of intellectual and spiritual melancholy in the modern mind.

Endnotes:

¹ For an extended discussion, see Andrea Carlino's *Books of the Body*, pp. 156-170 (Chicago, 1999).

² Richardson translates *ratio* as "regimen" (xlvi). *Ratio* also means system, or theory. In order to give display the ambiguity of the word, I have chosen to translate *ratio* as "doctrine," in order to highlight the importance of comprehensive systems in medical theory. Vesalius says elsewhere uses the phrase "*medendi rationem*" to describe the doctrines that govern the separate but related processes of diagnosis, prognosis and therapeutics. Though Richardson's use of the word "regimen" implies a similar idea, I believe it fails to communicate the importance and broad

acceptance of medical *theory* as a basis for praxis. N.B.—*Manus opera* refers to surgery, but also the treatment of fractures—basically all types of work performed by the hands.

³ Carpi's edition of Mondino's *Anothomia* has numerous illustrations to accompany the text; however, Vesalius' engravings represent a much higher level of detail and accuracy.

⁴ The original Latin reads: "Cæterùm peruersissima hæc curationis instrumentorum ad uarios artifices diductio, adhuc multò execrabilius naufragium, aalongè atrociozem cladem præcipuæ naturalis philosophiæ parti intulit, cui quum hominis historiam complectatur, firmissimum[que] totius medicæ artis fundamentum, ac constitutionis initium iure habenda sit, Hippocrates & Plato tantum tribuerunt, ut illi inter medicinæ partes, primas esse adscribendas non dubitarint. Hæc nanque cùm prius à medicis unicè excoleretur, ipsi[que] in hac adipiscenda omnes neruos intenderent, tum demum miserè collabi cœpit, quum ipsi manuum munus ad alios reijcientes, Anatomem perdiderunt" (2v-3r).

⁵ Although the smaller images make cross-referencing easier, much of the detail of the original illustrations is lost.

⁶ He mentions the benefits of studying anatomy in the fifth chapter, and then proceeds to give various philosophical, theological, and artistic reasons for having knowledge of the human form. Crooke does not become "scientific" in his approach until the fifteenth chapter.

⁷ Jonathan Sawday appears to be the only scholar to consider Crooke's contribution beyond a mere mention.

⁸ One cannot even argue that Lyly's division of the narrative into letters (or epistles) represents an original arrangement, since the precedents of epistolary arrangement go back as far as ancient Greece. Refer to "Chapter One."

⁹ I find it likely that Crooke is using the term *cleave* in its double-sense, meaning both to separate and to adhere (see OED, "cleave"). If so, the verb works perfectly to demonstrate the point that I am trying to make about systematic organization, which allows both for division and coherence on the basis of proximal and functional relationships.

¹⁰ See "Introduction."

¹¹ See "Introduction."

¹² See "Chapter Three."

¹³ Paradox here signifies something along the lines of a challenge to established truth. *OED* 2nd ed. s.v. "paradox."

CHAPTER THREE

SEMEIOLOGIA AND THE POETICS OF ANATOMY IN JOHN DONNE'S ANATOMY OF THE WORLD

Renaissance medicine existed between two worlds. On the one hand, medical practice emerged on-track from the middle ages to become a dogmatically 'scientific' tradition. Such august societies as England's Company of Barbers come into existence as early as the twelfth century. Sidney Young, nineteenth-century biographer of the Barber-Surgeons Guild, recounts that Pope Alexander III declared at the Council of Tours in 1162, that the practice of surgery was "incompatible with the holy office of the clergy," ceding sole responsibility for the "shedding of blood" thereafter to the likes of the Company of Barbers and the Surgeon's Guild (Young 22). Young admits that the original intent of the Barber's Guild seems to have been religious as well as social: "for attending the funerals and obits of deceased members and their wives, and for feasting once a year." He observes, however, that the Company quickly secularized. Eventually the Company of Barbers acquired the right to license and train its own members, becoming in essence a trade guild (Young 21). During the first year of Henry IV's reign, in 1462, the Company of Barbers obtained its "Charter of Incorporation," the text of which included a mandate for the regular performance of human dissections for technical training (Young 361).

In quite the reverse fashion, the practice of popular medicine remained rooted in the highly esoteric worlds of Greek and Islamic astrology. A resurgence of classical texts during the Renaissance made Greek material even more foundational to medical training than it had been during the Middle Ages. As noted in the previous chapter, Europe rediscovered much of the Greek and Roman medical traditions through its appropriation of Arabic and Persian scholars, who managed to preserve innumerable ancient texts, especially those of Hippocrates and Galen—a process of rediscovery that began in England shortly after the Anglo-Saxon period,

during the twelfth and thirteenth centuries (Bonser 44, 156). Though Hippocrates' theory of humors had long been recognized in Europe as 'fact,' the importation of countless ancient medical texts from Arabo-Persian sources—nearly all of which pointed back to a common origin in the Hippocratic corpus—only solidified the physician's reputation (along with that of his successor, Galen) as the fountainhead of authoritative medical knowledge.

Much of what European readers received from Islamic translators existed in the form of commentaries, epitomes, or as text with commentary. As such, Greek and Roman sources underwent a process of 'filtering' during translation. Though humanist scholars believed they were witnessing the re-birth of classical thought, in actuality they were reading ancient material through the lenses of Islamic philosophy and theology. Only much later, with the recovery of original Greek and Roman sources, did European scholars recognize the difference—a recognition that brought about momentous shifts in scientific thinking.

In the meantime, however, Medieval and early-Renaissance medicine drew significantly from traditional Islamic cosmology, introducing Europeans to alternate theories of medical practice based on understandings of the relationship between man and the Universe. Increasingly, Early Modern physicians began to see the study of medicine as a method for unlocking 'hidden' knowledge about human illness. In part, the rise of what many consider an 'occult' attitude toward the practice of medicine results from the importance that Islamic theorists (elaborating on Greek sources) attach to the function of "signs," both in the body and in the heavens. Although the bulk of Islamic medical writings deal with the familiar Hippocratic categories of diagnosis, prognosis, and treatment, throughout these texts (and their European counterparts) one observes that medicinal practice consists mainly in interpreting, or judging signs—a project that elaborates a particular understanding of the human body as a bridge between the far-flung heavens and the immediate earthly existence.

In this chapter, I will continue to examine the status of anatomy in medicinal theory. In particular, this essay will explore the relationship between the body as sign, and the body as material. I will argue that the bifurcated character of medicinal practice during the early modern and Renaissance periods mirrored ongoing debates about the nature of the universe, including those caused by the controversies surrounding Copernican astronomy. Lastly, as a way of imagining the confused relationship between practical medicine and the ‘New Science’ of physics, I will propose a reading of John Donne’s *The Anatomy of the World*, which, I hope, will give life to a new definition of anatomy in the seventeenth century.

First, however, I believe it is critical to establish a theoretical framework for the rest of the chapter. Specifically, one must recognize the ways in which medical semeiology and literary semiotics function as homologous structures. This is somewhat difficult since the texts that deal with semeiology and semiotics vary in topic. Additionally, sixteenth and seventeenth-century authors would not have framed their arguments in such modern terms. It becomes obvious, however, that they were aware of certain affinities between existing intellectual structures. We can, as a result, reconstruct the theoretical context that gave life to controversy in Donne’s poetry, with a great deal of work and a fair bit of maneuvering.

In 1916, Saussure used the term ‘semiology’ to describe what he hoped would become a new science of the sign. Such an unprecedented discipline would, according to Saussure, study “*the role of signs as a part of social life*” investigating “the nature of signs and the laws governing them” (Saussure 15). While many credit Saussure with coining the term in his lectures (which were later published as *Cours de linguistique générale*), the word semiology has had a reasonably a long history of usage. Saussure himself fails to credit a source for the term, arguing instead that the science of semiology “does not yet exist” (15); however, instances of comparable treatment can be dated to as early as the seventeenth century.

Those familiar with the history of cryptography will remember John Wilkins' treatise, *Mercury, or the Secret and Swift Messenger*,¹ which appeared in 1641, shortly before the beginning of the English Civil War. Wilkins' discourse, according to the title page, aims at "Shewing, how a man may with Privacy and Speed communicate his Thoughts to a Friend at any distance." During a period when written communications often passed through the hands of numerous individuals, many of whom were potentially critical of the content, the ability to conceal the true meaning of a message was rather important. In response, Wilkins developed a method of secret communication, using ciphers, that was "difficult to bee unfolded, if it should bee doubted of, or examined" (Wilkins 13). Wilkins lists three methods of clandestine communication, which he characterized with three modes of discourse: *cryptologia*, the secrecy of speaking; *cryptographia*, the secrecy of writing; and *semælogia*, the use of signs or gestures to obscure meaning (Wilkins 14). Naturally, Wilkins' last category, *semælogia*, opens an interesting course for the current inquiry to pursue.

Semælogia is, for Wilkins, divided into two sub-categories: those signs which are *ex congruo*, having "some naturall resemblance and affinity, betwixt the action done, and the thing to be exprest" (Wilkins 111); and *ex placito* signs, which "have their signification from use and mutuall compact" (Wilkins 113). *Ex congruo* signs consist of all outward gestures that demonstrate inward passions, including religious acts like genuflection, which display the congruence between the gesture (bowing) and the impulse (humility). On the other hand, *ex placito* signification describes gestures that convey meaning only because a number of individuals have agreed arbitrarily to have them bear significance. According to Wilkins, the last category of signification (*ex placito*) makes possible an infinite number of sign-languages, as long as there is agreement between parties (Wilkins 115). From the perspective of Wilkins' arrangement, *semælogia* is limited to the outward performance of representative actions, though

modern semioticians might argue that all communication of the interior world, including speech and writing, exists as *semælogia*, when defined in such a manner. I believe that Wilkins' idea of congruence helps to clarify certain models of signification in the practice of medicine. Keeping in mind Wilkins' configuration, therefore, I would like to explore medical understandings of semiology in the seventeenth century.

In 1625, James Hart published *The Anatomie of Urines*, wherein he discusses the manner by which physicians diagnose various types of illness simply by examining a patient's urine. Readers will not discover anything truly original in Hart's treatment of the subject. In fact, it is the conventionality of Hart's text that makes it interesting for the current discussion. Urinalysis had been a standard practice of medicine since the ancient world, finding its most famous supporters in Hippocrates and Galen. In most seventeenth-century texts, however, urinalysis is described as only one method of diagnosis among many—though one of the more important.

Again, it is not Hart's subject that draws our attention, but rather his use of terms. In *The Anatomie of Urines*, Hart uses the traditional word 'semioticke' to give a better sense of the function of diagnosis. He writes: "diagnosticke or semioticke [...] teacheth us to know the nature, causes, and the substance of the disease by the signs and grounds of the same" (Hart 13). 'Semioticke' refers, of course, to the Greek word *semeion*, or sign, as does the English word 'symptom.' Ancient physicians viewed symptoms not only as signs of sickness, but as specific clues to the nature of a disease, and its eventual outcome. Hippocrates argued that a physician's talent and reputation centers on his skill at interpreting signs. This emphasis on the importance of symptoms persisted well into the modern period. In fact, as late as the nineteenth century, most physicians knew diagnostics alternately as *semiologia*, its Latin equivalent—a fact with which Saussure may have been familiar.

Semiological diagnosis is a rather important component of traditional medical theory.

Time-honored prohibitions against dissection meant that the interior structures of the human body represented an inaccessible mystery for physicians well into the early modern period. Generally speaking, diagnosis had little to do with modern understandings of pathology. Rather, physicians relied on their ability to interpret the significance of a patient's symptoms, from which they would devise a strategy for treatment. Due to the rising popularity of Arabic medical and hermetic texts during the Middle Ages, however—especially recovered Galenic texts with Islamic commentary—medicine began looking more and more to the science of astrology for aid in the related activities of diagnosis, prognosis and treatment. While prevailing theories suggested that the organs affected the body in a foreseeable manner (either positive or negative), many Renaissance physicians held that these organs were themselves affected by the influence of celestial bodies. Whereas physicians were somewhat limited to the observance of external 'gestures' produced by illness before, early modern practitioners argued that the interpretation of heavenly signs (what we might call cosmological semeiology) was equally important.

We recognize this line of thinking as an expression of ancient ideas about the correspondence between the Macrocosm and Microcosm. Hermetic texts, especially the works of Paracelsus, took these notions a bit further, developing elaborate cosmological systems that began to break down the conceptual barrier between the two *cosmoi*. Man did not relate to the macrocosm simply by analogy: he *was* the microcosm. Brian Vickers argues that in the hands of sixteenth-century mystics like Paracelsus, "The move from analogy to identity is total" (Vickers 126). He means, of course, that the microcosm became a substitute for the macrocosm, and vice versa. In theory, having an adequate understanding of the nature of the heavens and movement of the planets—all of which realities correspond perfectly to microcosmic structures—make accurate knowledge of the human interior unnecessary. The effect, as I argue in the first chapter, is that human dissection, long considered questionable in most cultures, is replaced by metaphysical

anatomies of the cosmos, or cosmo-anatomies. The idea of cosmological substitution is important in Arabic and Persian cultures, where human dissection represents an unthinkable atrocity against the coherence of God's creation. To some extent then we can understand why Islamic philosophers and physicians placed such emphasis on astronomical knowledge.

The most recognizable innovation resulting from the influence of Islamic cosmology in Europe is the common almanack. The word '*al-manakh*,' Arabic in origin, means 'climate,' implying its most common usage as a forecast of weather, drawn from astronomical information. During the sixteenth and seventeenth centuries, however, almanacks were an indispensable tool of popular medicine. Some of the best examples of almanacks from the seventeenth and eighteenth centuries are in fact the work of some prominent (and some not so prominent) physicians. Large numbers of practitioners consulted these almanacks as a quick reference for diagnosis and prognosis, basing their opinions on the observance of the exact positions of the celestial bodies (from charts and tables) and the presumed effect of these bodies on the nature, length and outcome of disease. According to theory, these congruencies between the macrocosm and microcosm are described in terms of their 'sympathies' and 'antipathies,' or harmonies and contraries.

Though the astrological features of the almanack are widely known, and therefore not the primary subject of this paper, I would argue that the semeiological approach of the almanack, as a medical device, remains largely unresearched. At the heart of the production of almanacks is the suggestion that the universe can be read like a text. Seventeenth-century physician, astrologer and writer of almanacks, Nicholas Culpeper, refers to the universe as a "cosmic text," or the "Book of the Creatures" (*An Ephemeris for the Year 1651*). [FIGURE 3.1] Reading the cosmic text requires a special kind of interpretative process, which he calls judgment. Framing Culpeper in Saussurian terminology, we might argue that the affinities between celestial signifiers and the earthly signified produce adjudicative meaning—significance that must be adjudged from

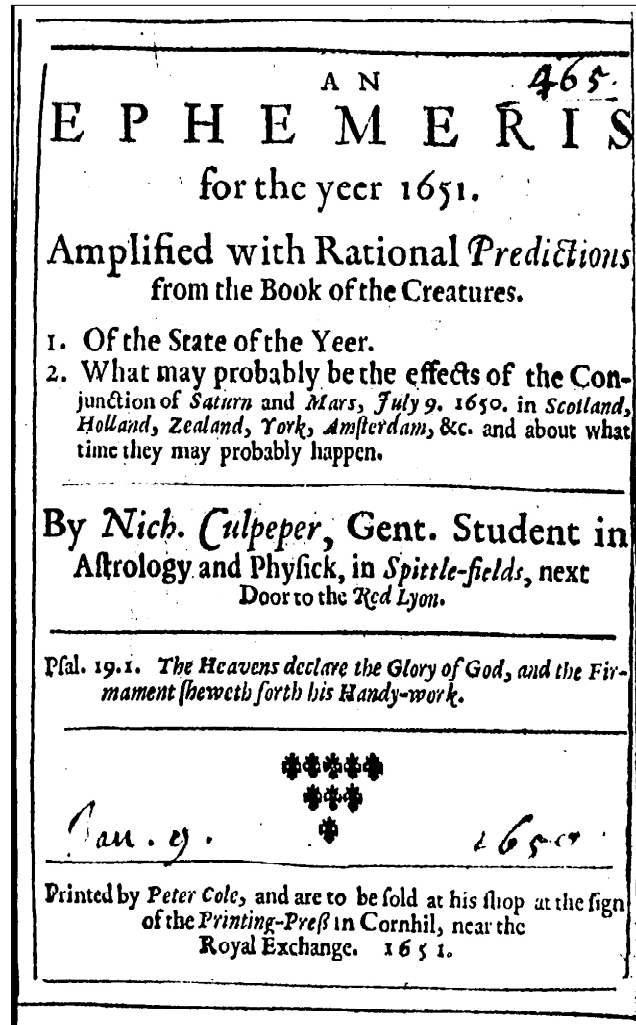


FIGURE 3.1. Title-page to Culpeper's *An Ephemeris for the year 1651*.

the evidence provided by the cosmos—leading thus to the official term for the practice, judicial astrology. Of course, the language employed by the *Book of Creatures* is neither written, nor spoken. Recalling Wilkins' categories of communication, semeiology (or semeiotics) concerns itself with 'signs'—which, in the case of judicial astrology, denote *ex congruo* relationships between the heavens and the body.²

Though Wilkins is unclear about the nature of the linguistic affinities between the sign and the signified (a relationship strictly defined by Saussure in the twentieth century), Culpeper expresses what many might consider an occult understanding of signification, described before

as cosmic substitution. For Culpeper, the external gestures of the macrocosm correlate to the internal gestures of the human body in a one-to-one relation. Explaining the generic nature of this relationship, Eugenio Garin notes: “The celestial configurations were both signs and causes; in fact they are signs *because* they are also causes” (Garin 16). In other words, the actions of the cosmos do not convey meaning by imitation or analogy, they are, as Cassirer writes, meaning “made visible to us” (Cassirer 8).

The most recognizable expression of astrological semeiology is the familiar ‘zodiak man,’ or in the terminology of the time, the ‘anatomy of man.’ [FIGURE 3.2] Again we can look to Islamic influences for context. Compared to Muslim cosmological systems, the Europeanized ‘zodiak man’ represents something of a simplification. Muslim scholars emphasized the meditative nature of the relationship between macrocosm and microcosm. Their efforts gave rise to endless



FIGURE 3.2. Zodiac Man from Thomas Digges’ *A Prognostication Euerlasting of Right Good Effect* (1605). Image courtesy of the History of Science Collections, University of Oklahoma Libraries.

attempts at illustrating the spiritual significance of the heavens, and the meanings behind their influence on mankind. These ‘illustrations’ (for lack of a better word) are distinctly Islamic, insofar as the act of depicting earthly and celestial realities requires the abstracted, spiritual languages of mathematics and ‘divine geometry.’ Such representations reaffirm the Islamic idea of unity, or *tahwid*, while upholding traditional taboos against reproducing the human form. As a result, cosmological congruencies between man and the universe assume the form of linguistic and semeiological analogies, rather than one-to-one depictions of common identity. For an orthodox Muslim to go further, effectively erasing the line between signifier and signified, would result in heresy, or even idolatry.

This is not to say that Muslim thinkers disbelieved in the direct correlation of the heavens with the human body. Tenth-century Muslim physician and philosopher, al-Biruni, writes:

[...] the various parts of the body [...] are related to the several signs. The head and the face to Aries, the neck and windpipe to Taurus, the arms and hands to Gemini, the chest, breasts, sides, stomach and lungs to Cancer, the heart to Leo, the womb with its contents to Virgo, the back and buttocks to Libra, the genitals to Scorpius, the thighs to Sagittarius, the knees to Capricorn, the shanks to Aquarius and the feet and heels to Pisces (qtd. in Nasr 158).

Seyyed Hossein Nasr comments: though the signs are “related to the parts of the body and may be said to form their macrocosmic counterparts,” such correspondences work, by analogy, to support a “contemplative perspective” of the Universe (Nasr 158). Such an attitude works more toward a metaphysical application of the human body, what Nasr later refers to as the “Anatomy of Being” (Nasr 197). Interest in the flesh and bone of dissection is, in contrast with European configurations of the same system, relatively absent.

Early modern almanack writers cling to the idea of anatomy in a much more visceral, if less philosophic fashion. In effect, their depictions of ‘zodiak man’ serve two purposes: 1) they attempt to visualize traditional understandings of the correlations between the celestial bodies

and the human form, in a less abstract manner; while, 2), cashing-in on the recent popularity and influence of the new science of anatomy. A typical example of this negotiation can be found in England's first major almanack, *The Shepherds Kalender*, written anonymously during the mid-sixteenth century.



FIGURE 3.3. Zodiak-man from the *Shepherds Kalender* (c.1600).

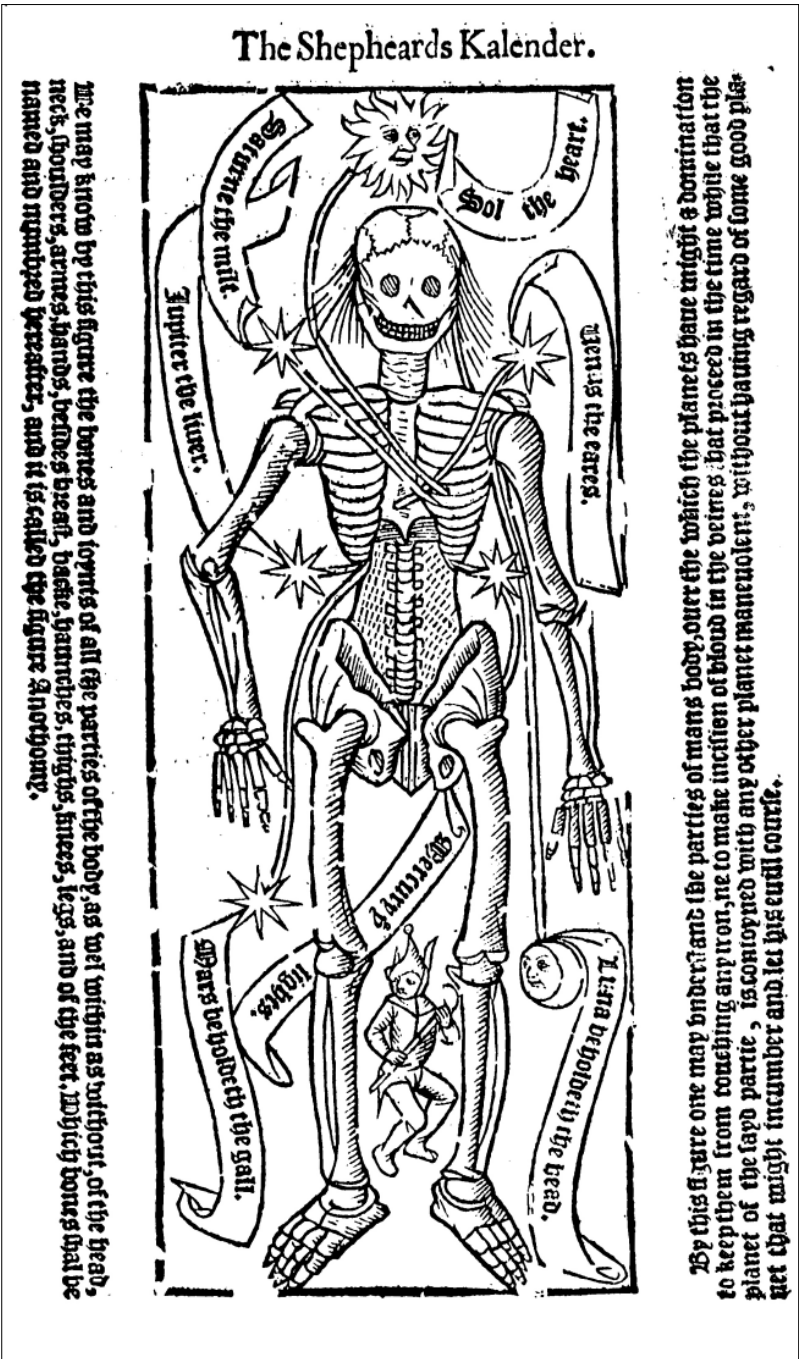


FIGURE 3.4. Anatomy of Zodiak-man.

The author of *The Shepherds Kalender* presents his audience with two variations of ‘zodiack man’: the first a traditional medieval representation of the human form overlaid with the twelve signs of the zodiack; and the second a dissected corpse bearing indicators of the organs and their governing ‘stars.’ [FIGURES 3.3 & 3.4] The text around the second image reads:

We may know by this figure the bones and ioynts of all the parties of the body, as wel within as without, of the head, neck, shoulders, armes, hands, besides breast, backe, haunches, thighs, knees, legs, and of the feet. Which bones shall be named and numbered hereafter, and it is called the figure Anothomy. [...] By this figure one may understand the parties of mans body, over the which the planets have might & domination to keep them from touching any iron, ne to make incision of bloud in the veines that proceed in the time while that the planet of the sayd partie, is conioyned with any other planet malevolent, without having regard of some good planet that might incumber and let his evil course (Anonymous h5 recto).

I quote this long passage in an effort to show that the semiological act of linking the twelve signs of the zodiack with the physical body of man in the one conjoined sign—zodiack man—is already a considerable alteration to Islamic configurations. Immediately—on the level of basic signification—one finds it more difficult to separate the individual identity of the microcosm from that of the macrocosm. This confusion is more pronounced in ‘Figure 3.4,’ however. No longer do the planets and stars simply overlay the body, a representation that maintains a minute level of visual separation (the internal from the external); in the anatomy, the inner world of the microcosm is opened and the individual organs are labeled with the name of their celestial counterparts, conflating the identity of both. Of course, the author argues that his image reveals the “likenesses and similitudes” man has with the “greate worlde,” similarities that make him a “little world by himselfe” (Anonymous h4 recto). One finds, however, in the actual ‘working-out’ of medical practice, that the semiological impact of ‘zodiack man’ leads to less analogistic significations. The ‘anatomy of man’ has a functional existence beyond simple ornamentation and metaphorical elaboration. Astrological diagnosis and prognosis rely heavily on the one-to-one relationship between the position of the moon in the zodiak and the corresponding body

part ruled by a particular sign. Writing on the uses of almanacks in astrology, Herbert Leventhal explains:

The reader would be told to check the calendar portion of the almanac where, for each day, was listed the sign of the zodiac which the moon was “in.” Then, by checking the anatomy, one could determine which part of the body the moon governed, or was “in,” that day (Leventhal 32).

In such a fashion, ‘zodiack man’ serves the function of creating a *semiotic bridge* between the distant heavens and the internal structure of the human body, resulting in what Brian Vickers calls a “reification of metaphor” (Vickers 119-20), where the “imaginative or imaginary connection between discrete entities” (Vickers 122) vanishes under the weight of newly substantiated correspondences; and it is precisely this semiological configuration that earns the medical discipline its ‘occult’ status during the early modern period.

We should remember that the original implication of the word ‘occult’ suggests simply the existence of secret knowledge. Occult knowledge is, in actuality, often mundane, referring to the undisclosed activities of everyday life, and not necessarily cabbalistic activity, or the practice of magic. In this sense, ‘occult’ denotes a lack of public access to a given subject or event, such as the meaning of observable symptoms in the body. When practitioners of astrological medicine refer to the ‘occult sciences,’ of which they consider their discipline a part, the meaning is often more difficult to ascertain. Hidden knowledge, even that which is ‘scientific’ in its manner of discovery and application, necessitates an act of ‘decryption,’ to use Wilkins’ terminology. Accordingly, the astrological physician stands in the position as both the holder of the decryption ‘key’ and (perhaps more importantly) as the interpreter and disseminator of hidden knowledge.

We cannot underestimate the importance of such an attitude on the general suppositions of medieval and early modern culture. For the majority of common, religious Europeans, the universe existed as vast reservoir of God’s mysteries. Scholars too found the urge to discover a

“key” to the secrets of the universe irresistible, fueling the popularity of alchemy and magic as *science* during the sixteenth and seventeenth centuries. At the same time, however, reemerging debates over the true composition of the universe began to diminish the respectability of the ‘occult sciences.’ The new discoveries of Brahe, Copernicus and Galileo, in particular, presented challenges to traditional cosmological systems. The implications of these discoveries created ripples in nearly every sphere of intellectual activity, including that of the artist. It seemed for a while in fact that art could not find a more crucial subject to explore than the findings of the “New Philosophy,” as historians have named it. Among those who stand out for their attention to science, John Donne has become an important figure.

John Donne’s *An Anatomy of the World* has been linked with the controversies surrounding the adoption of Copernican astronomical science during the late sixteenth and early seventeenth centuries for some time now. History of Science and literary scholar, Pamela Gossin, remarks: “It is now standard for scholars in both fields [science and literature] to regard Donne as the human embodiment of the Copernican “crisis” of the Scientific Revolution” (Gossin 34). Donne’s status as the *incarnation* of scientific crisis is, in fact, emblematic among theorists of the History of Science, beginning with Thomas Kuhn’s argument during the 1960’s that Donne’s poetry epitomizes popular fears about the consequences of the new “mathematical astronomy”: namely, the “dissolution of traditional cosmology,” which seemed likely to follow the acceptance and installation of heliocentric configurations (Kuhn 194). During the last four decades, Kuhn’s research has occasioned endless scholarship on the exchange of ideas between science and literature, and Donne’s *An Anatomy of the World* and *Ignatius His Conclave* have played a significant role.

Regarding Donne’s attitude toward the ‘New Science,’ however, literary scholars have drifted into a number of camps. Some scholars like R. Chris Hassel, Jr. maintain that “the tone

and method of Donne's presentation of Copernicus and Galileo" in *Ignatius His Conclave* is one of "amused ridicule" (Hassel 332). Hassel goes on to argue that Donne's 'interests' in the repercussions of Copernican astronomy are relatively impersonal, displaying concern more for "disillusionment in his fellow man," than from any privately perceived threat to "religious belief" (Hassel 335). *Ignatius His Conclave* freely engages Copernicanism in a playfully satiric manner, according to Hassel. Donne himself is above the personal crisis of his peers.

Other commentators observe a more serious tenor in Donne's constant dealings with the emerging science. David Hirsch finds much of Donne's poetic energy centered on "the revival of ancient atomism" during the early seventeenth century (Hirsch 69). Hirsch notes that Donne's personal library contained numerous books on atomic theory, many of which he may have obtained through his personal contacts in the Northumberland Circle—"a group of the most progressive men of science in England"—nearly all of which members were proponents of atomism (Hirsch 72). According to Hirsch, Donne's *Anatomy of the World*, published shortly after *Ignatius His Conclave* (both in 1611), addresses the poet's personal anxieties about the corruption and dissolution of the universe into its indivisible components, *atomi*. Donne, he argues, adopts the anatomical analogy of dissection as a means of arguing for a special kind of unity within the "natural disintegration of physicality"—specifically, the presence in creation of "an immutable form of matter [atoms] which will secure resurrective possibility" (Hirsch 88). In support of this reading, Hirsch quotes from one of Donne's Lenten sermons:

God's first intention even when he destroys is to preserve, as a Physicians first intention, in the most distastefull physick, is health; even God's demolitions are super-edifications, his Anatomies, his dissections are so many re-compactings, so many resurrections (qtd. in Hirsch 88).³

From Hirsch's perspective, the indivisibility of the atom makes it a crucial element of Donne's theory of resurrection. For many of Donne's contemporaries, however, atomic theory

represented the complete dissolution of ‘unity.’ Hirsch contends, on the contrary, that Donne regarded the ‘immutability’ of the atom as a final check on complete disintegration. In other words, the body can be anatomized past the point of recognition, its parts spread to the ends of the earth, and still God is able to maintain the unity of creation by “re-compacting” that which he first dissected. In fact, the indivisibility of atoms provides for that possibility.

Though Hassel and Hirsch raise a number of interesting points, I believe both fail to appreciate the complexities that Donne wishes to explore. *Ignatius His Conclave* and *An Anatomy of the World* work together to provide a snapshot of Donne’s intellectual activity during the years 1610 and 1611. The satirical tone of *Ignatius His Conclave* alters the manner in which we read the serious concerns of the *Anatomy*, but pitch alone cannot dissolve Donne’s anxiety. The *Anatomy of the World* is perhaps less concerned with defending the material processes of resurrection, as Hirsch would have it, than with making general statements about the world and science. Taken together, the works demonstrate the diversity of Donne’s talent in approaching related topics with vastly different forms. I would argue in fact that both texts reveal the interest and methodology of a poet, and not necessarily those of the clergyman.

In his chapter on *Ignatius His Conclave*, Charles Coffin uses one word repeatedly, as a kind of thematic keyword to describe one of Donne’s central concerns: innovation. Donne uses the term “innouation” at the beginning of his satire to articulate the *character* of religious heresy as an “affront to all antiquitie” (*Ignatius* 6). The Latin version is perhaps more specific about the nature of the insult: “vt [...] antiquitati barbam vellerent,” “so that they plucked the beard from antiquity” (*Conclave Ignati* 6). Donne’s narrator regards the work of innovators—their attempt to overthrow traditional systems—as disrespectful of the traditions and knowledge of the ancients. In this context, Donne’s use of the word innovation is not unlike Islamic understandings of the nature of heresy as *bid’ah*, or innovation. In fact, after introducing the term, he launches

into an ironic description of Pope Boniface III⁴ and “*Mahomet*” as equal contenders for the “highest roome” in Hell, given by the chief innovator, Lucifer, to the one who achieves the most innovation in life. Donne comments: “Hee [Boniface] gloried of hauing expelled an old Religion, and Mahomet of hauing brought in a new: each of them a great deluge to the world” (Donne *Ignatius* 7). In effect, Donne turns the Islamic idea of *bid’ah* against the Prophet of Islam, ranking him among the greatest of innovators, for having created a ‘new’ religion—though Boniface III reserves the ultimate title. In *Conclave Ignati*, however, Donne uses less explicit language to describe innovators as those “qui ita aliquid noui in vita moliti fuerant” [those “who thus had undertaken something new in life”] (*Conclave Ignati* 6). Since, however, most critics agree that the English translation of *Conclave Ignati* originates with Donne himself, we can attribute the introduction of the idea of ‘innovation’ to the poet.

Both Coffin and Hassel comment on the conflation of religious innovation with that of the ‘New Philosophy.’ For Coffin, Donne’s understanding of innovation is limited to “a denial of truth, not simply established and accepted opinion, but truth” (Coffin 207). On this ground he absolves each of the targets of *Conclave Ignati*’s satire, with the exception of Ignatius, who, Coffin argues, “has utter disregard for truth and is possessed of no quality on which even the frailest case for redemption might be established” (Coffin 207). With regard to the propositions of Copernicus and Galileo, Coffin acknowledges the controversy created by their writings, but disputes the suggestion that either figure rises to the level of innovator. Donne, he argues, expresses nothing but “respect for the new science and [...] openness of mind” in his treatment of the dispute between Ignatius and Copernicus (Coffin 212).

Cited above, Hassel’s article, “*Donne’s Ignatius His Conclave and the New Astronomy*,” identifies a number of problems with Coffin’s reading. With regard to the level of “respect” he has for the astronomers, Hassel argues that Donne is “hardly open-minded or admiring of these

men and their work” (Hassel 330). Hassel bases his opinion on the fact that Donne seems to equate the “innovative exuberance” and dangerous “audacity” of the Jesuits with innovators in the ‘New Science’ (Hassel 330). Once again the idea of ‘innovation’ becomes a central concern in attempting to parse Donne’s personal opinions. After all, the propositions of the ‘New Science’ represent a break from the standard Ptolemaic understanding of the universe—a system that most scholars considered to be the “truth for almost fifteen hundred years, a truth involving many Christian beliefs”—making Copernicus a prime target for Donne’s satire. Hassel continues, explaining: “Both the Jesuits and the astronomers are clearly damnable, audacious, arrogant innovators. That is why they are all engaged in the same conclave, and that is what unites the satire” (Hassel 331). Hassel’s remarks draw attention to an overt detail that Coffin seems to ignore in his defense of Copernicus: namely, each of the innovators identified in the satire remain damned in the end. Donne makes it quite clear that innovation is the cause.

Thus Coffin’s definition of innovation collapses under the weight of its own exclusivity. The narrator’s opinion of Copernicus, as one of whom “I had never heard ill,” matters little (*Ignatius* 12). Even his contention that the “*Papists* haue extended the name, & the punishment of Heresie, almost to euery thing” appears naive when one recalls that, according to Church doctrine, God, not the Church, retains the power of final judgment. Copernicus is a member of the Conclave because he is one among a variety of innovators. The definition of innovation that Donne uses in *Ignatius His Conclave* is in fact much broader than Coffin admits. The narrator explains:

to this place, not onely such endeauour to come, as haue innouated in matters, directly concerning the soule, but they also which haue done so, either in the Arts, or in conuersation, or in any thing which exerciseth the faculties of the soule, and may provoke to quarr[]elsome and brawling controuersies: For so the truth be lost, it is no matter how (*Ignatius* 11).

In this way, Donne emphasizes the importance of innovation as a source for the provocation of “controuersies,” or, in the terminology of Catholic doctrine, scandals. In a quasi-legal sense

then, Donne speaks about controversy as a kind of dispute possessed of the potential to make believers lose their faith in God (or his representatives on earth, the Church and clergy). As such, the reliability of truth [*veritas*] appears contingent on the source and the outcome of its use. Truth retains its bond with historic authority: in this case the doctrines of the Church as a *type* of authority that should not be dismissed [*amittatur*] by earthly agents (Jesuit or otherwise) without careful consideration.⁵

Although I do not mean to suggest that Donne wished to defend the Roman Catholic Church, his choice to couple the innovations of the Jesuits with those of Copernicus is telling of a general attitude toward a particular mode of innovation. Lucifer's "secret place" in Hell is filled with innovators, whose main accomplishment is the displacement of traditional sources of knowledge (Ignatius 6). Thus the satirical status of innovation in *Ignatius His Conclave* helps to demonstrate the complex conditions that burden all notions of *truth* during the Renaissance—circumstances with which Donne would have been intimately familiar, following his Jesuit education and subsequent conversion. It seems quite clear, moreover, that Donne's wariness of innovation arises not from any real concern about the addition of 'new truths,' but from general anxieties relating to the casual dismissal of 'old truths'—both religious and scientific.

Donne makes use of the ensuing dispute between Ignatius and Copernicus to address this very point. Copernicus first appears before Lucifer to plead his case for admittance as an innovator, boasting:

I am he, which pitying thee who wert thrust into the Center of the world, rayseed both thee, and thy prison, the Earth, vp into the Heauens; so as by my meanes *God* doth not enioy his reuenge vpon thee. The Sunne which was an officious spy, and a betrayer of faults, and so thine enemy, I haue appointed to go into the lowest part of the world. Shall these gates be open to such as haue innouated in small matters? and shall they be shut against me, who have turned the whole frame of the world, and am thereby almost a new Creator? (Ignatius 13-14)

The narrator notes that Lucifer hesitates before judging Copernicus' case, because he fears the

“great ambitions, and undertakings” of the mathematician. He adds, however, that “*Ignatius Layola* which was got neere his chaire,” overhears the conversation, and, not desiring to share his title, attempts to downplay Copernicus’ achievements (*Ignatius* 15). In response, Ignatius asks the mathematician:

what new thing ha[v]e you inuented, by which our Lucifer gets any thing? What cares hee whether the earth traueil, or stand still? Hath your raising vp of the earth into heauen, brought men to that confidence, that they build new towers or threaten God againe? Or do they out of this motion of the earth conclude, that there is no hell, or deny the punishment of sin? Do not men beleeeue? do they not liue iust, as they did before? (*Ignatius* 18)

Given the impact of Copernicus’ work on Galileo and the success of the heliocentric model, Ignatius’ comments are curiously dismissive. Charles Coffin interprets Ignatius’ indifference as further evidence of Donne’s “respect for the new science” (Coffin 212); yet, Donne’s narrator is quite clear about Loyola’s motivation: he is “content that they [other innovators] should bee damned, but not that they should gouerne” (*Ignatius* 15-16). By implication, Ignatius sees Copernicus as a rival for the title of chief innovator. His refutation of Copernicus is, therefore, simply a maneuver to maintain rank, making everything that Ignatius says about the mathematician doubtful, as a result.

Because *Ignatius His Conclave* is a satire, Donne’s attitude toward the new science remains obscured. For this reason I believe it advantageous to consider another major work of this period, Donne’s *An Anatomy of the World*, as a supplement to his thinking during 1610 and 1611. The context and form of the poem are well known. *An Anatomy of the World* belongs to a set of three poems occasioned by the death of Elizabeth Drury, daughter of Donne’s patron at the time, Robert Drury.⁶ Known to many as *The First Anniversary*, Donne composed the *Anatomy of the World* to commemorate the one-year anniversary of Elizabeth Drury’s death. While it is generally agreed that the poem plots a trajectory of earthly ruin—according to Donne’s argument the world becomes mortally sick after the death of Elizabeth—numerous scholars subscribe to Louis Martz’

assertion that “Elizabeth Drury has, basically, nothing to do with the sense of decay in the poem” (qtd. in Love 126). Far from being a panegyric, according to Martz, *An Anatomy of the World* merely capitalizes on Elizabeth’s death to advance the author’s interests.

The title of the 1611 edition does nothing to counter Martz’ position: “*An Anatomy of the World. Wherein, By Occasion of the vntimely death of Mistris Elizabeth Drury the frailty and the decay of this whole world is represented.*” Donne seems to imply that Elizabeth’s death functions only as the “occasion” prompting an exploration of the world’s current and future states. Her role, in this case, is quite reduced, leading some scholars to comment that the beginning to the poem looks like a “hyperbolic inflation of Elizabeth Drury,” when seen in relation to her lessening importance over the course of the poem, thereby creating a kind of poetic unevenness (Love 125). Harold Love attempts to answer this problem by suggesting that Donne’s rhetorical strategy relies on “a vision of the girl’s death not as the cause but as the consequence of the innate corruption of the natural world and hence the culminating argument for it” (Love 130). In other words, Donne’s approach for showing the advanced corruption of the world is to demonstrate the effect of nature on the body of Elizabeth Drury, who was the very essence of life itself. According to Love, Elizabeth Drury supplies a crucial piece to the poem’s argument, acting as the “animating spirit” by which all material is enlivened, brought low by a “vulnerable body” apt to decay (Love 131). Harold Love’s commentary is helpful in liberating Elizabeth Drury from Martz’ disapproval; yet it seems that even Love overlooks a rather crucial element in Donne’s scheme, one which, I think, brings us much closer to explaining her function in the poem. This omitted feature relates to the role of anatomy itself.

While scholarship on the history of medical science has never really waned, its relevance to other branches of study has not always been apparent. In recent years, a number of scholars have begun to explore the relationship between medicine and literature during the Renaissance and

Enlightenment periods—in particular the influence of anatomical science on the early modern imagination. John Donne’s *Anatomy of the World* is immediately suggestive of direct influence, making it a favorite target of researchers. In spite of this focused attention, much of what has been said about the poem falls into a rather limited grouping of comments about the “cultural novelty” of dissection (Sugg 131). In particular, scholars have been interested in examining Donne’s reaction to the practice of dissection and its understood relation to the “burgeoning atomic debate” taking place in England during the late-sixteenth and early seventeenth centuries (Hirsch 73). Such scholarship takes its cue from Thomas Kuhn’s aforementioned work on the influence of science on traditional understandings of cosmology. Working from Kuhn’s thesis, many researchers see Donne’s anatomical terminology as a conceit meant to house his critique of Democritean materialism and the suggestion that humanity can be reduced to the blind interaction of atoms. As we have seen, however, Donne’s actual position on matters related to the ‘New Science’ is quite difficult to read. Likewise, his use of anatomical imagery tends to obscure matters for the modern reader, rather than clarify them.

The appeal of anatomy is, for Donne, multi-layered. Richard Suggs notes that Donne’s exposure to the practice of dissection occurred relatively early, resulting from the occupation of his step-father, John Syminges, “a Fellow and sometime President of the Royal College of Physicians” (Sugg 131). Sugg also comments that Donne would have been exposed to a growing number of literary anatomies, which begin to appear during the late sixteenth century—corresponding to the introduction of Vesalian dissection in England—which number in the hundreds by the mid-seventeenth century (Sugg 131). Furthermore, considering the above discussion, we may add to these influences the popularized almanack-version of the “anatomic of man,” which no doubt would have been very familiar to Donne.⁷ Each of these three types of anatomy represents a distinctive expression of a related idea; and each represents a potential

source for Donne's examination.

Thus, a question arises about exactly *which* anatomy Donne wishes to reference. In part, the answer lies in Donne's persistent use of astronomical imagery. Donne's use of Elizabeth Drury as point of convergence between the microcosmic order and macrocosm is particularly revealing. At the beginning of the poem, Donne transfers the soul of his heroine to the heavens, remarking:

Whe[n] that rich soule w^{ch} to her Heaven is gone,
Whom all they celebrate, who know they have one
[...]
When that Queene ended her progresse time,
And, as t'her standing house, to heaven did clymbe,
Where, loth to make the Saints attend her long,
Shee's now a part both of the Quire, and Song,
This world, in that great earth-quake languished;
For in a common Bath of teares it bled,
Which drew the strongest vitall spirits out:
But succour'd then with a perplexed doubt,
Whether the world did loose or gaine in this,
(Because since now no other way there is
But goodnes, to see her, whom all would see,
All must endeuour to be as good as shee,)
(Anatomy 1-2, 7-18).

Donne's explanation of the "progresse" of Elizabeth's soul to heaven is reminiscent of the descriptions found in another well-known work circulating at the time: the *Astronomicon*, written by the first-century Roman poet Marcus Manilius. In much the same manner as Donne, Manilius describes the ascent of virtuous souls to heaven, where they become constellations of the night-sky and guides to mankind. He writes:

Or *Souls* which loos'd from the ignoble Chain
Of Clay, and sent to their own Heaven again,
Purg'd from all dross by Vertue, nobly rise
In *Aether* wanton, and enjoy the Skies
(The Five Books of M. Manilius 30).⁸

According to Manilius, the highest "arch" of heaven belongs to the gods. He explains, however, "The Godlike *Heroes* fill these next Abodes; / Those generous Souls, that ran an equal race / In

Vertues Paths, and claim a second place” (The Five Books of M. Manilius 32). Only a heroic life of ‘virtue,’ it seems, allows one to ascend to such an esteemed position in the skies. Likewise, Donne justifies Elizabeth’s ascension on the grounds that she is celebrated by everyone, and because “all must endeouour to be as good as shee.” Admittedly the virtues that define “goodnes” stand quite apart from the heroic virtues of the Greek and Roman pantheon—Manilius does include the “sages,” Plato and Socrates, as well as a number of women—yet each poet rewards ‘virtue’ in the same manner.

Donne seems intent on conflating Christian imagery with traditional astrological descriptions, like those found in Manilius’ *Astronomicon*. Elizabeth’s “progress” is itself an idea taken from the practice of astrology, suggesting both the movement of a planet through the signs of the zodiac, and the interval of a lunar month (twenty-nine and a half days).⁹ In addition, Donne informs the reader that Elizabeth ascends to heaven, as if she were climbing “t’her standing house.” Though many scholars agree that the word house, or *domus*, originates in Manilius’ *Astronomicon*, use of the word was common enough in Donne’s time. [FIGURE 3.5] In medical astrology, of course, the idea of the houses is fundamental to understanding the significance of a planet’s influence on the microcosm. On a very basic level, astrological practitioners form diagnoses and prognoses by first determining the position of a particular ‘planetary’ body in the sky at the appropriate time. Each house corresponds to 30° of the circular horizon, thereby creating twelve equal divisions of the sky—each of which carry distinct implications. According to eighteenth-century astrologer Richard Ball, the first house “hath signification of life, and from thence we judge all events appertaining thereunto;” and so on throughout the houses until the eighth house, which “signifies death, [and] sadness” (Ball 28-29).

While many practitioners developed different systems of signification (depending on the intended usage), and even variations on the number of houses (eight, twelve, sixteen), the

EPHEMERIS

IOANNIS ANTONII

MAGINI PATAVINI

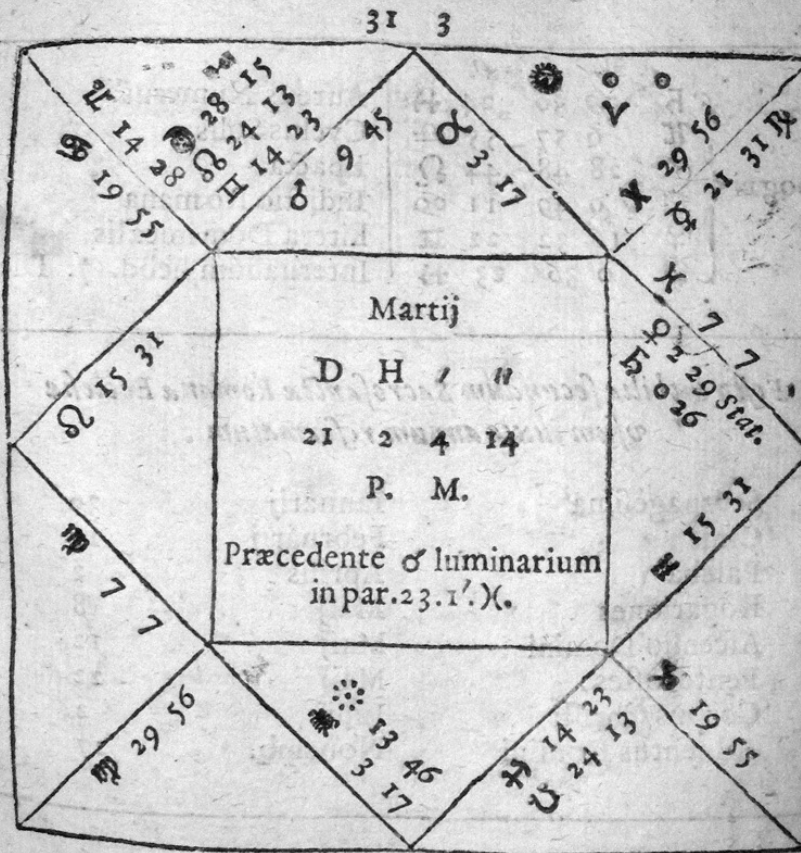
Ad annum Dominicæ

Incarnationis

1611.

Qui est tertius post Bissextilem, 29. à Kalendarij
Gregoriana reformatione, & ab
initio Mundi 5573.

*Figura cæli in ingressu Solis in ♄
æquinoctium veris.*



Anni Tropici vera magnitudo.

Dierum 365. Horarum 5. Scr. 55'. 32". 41^{'''}. 42^{'''}.
A

FIGURE 3.5. A typical depiction of the twelve houses, from John Maginus' *Ephemerides coelestium motuum* (1609). Image courtesy of the History of Science Collections, University of Oklahoma Libraries.

basic methodologies remain the same. Physicians tended to chart the position of the moon at the moment of the patient's birth (nativity), and then at the instant of his becoming sick (the decumbiture). With this information they generated a matrix of information, which allowed them to make judgments (based on specific interpretations of celestial significations) about the 'critical' moments of patient's sickness.

It seems quite clear that Donne follows the standard astrological formula in diagnosing the world's illness after Elizabeth's death. The first twenty-four lines of *An Anatomy of the World* appropriate the language of astrology to such an extent that the reader becomes confused about the metaphysical status of Elizabeth's soul. Does she in fact ascend to a Christian heaven, or does she, in a Manilian fashion, form a constellation on the horizon? Whatever the case may be, Elizabeth's progress "t'her standing house" (or her ruling house) is suggestive of astrological prognosis. Donne writes:

This great consumption to a feuer turn'd,
And so the world had fits; it ioy'd, it mournd.
And, as men thinke, that Agues physicke are,
And th' Ague being spent, giue over care,
So thou, sicke world, mistak'st thy selfe to bee
Well, when alas, thou'rt in a Letargee (Anatomy 19-24).

To a seventeenth-century physician, these lines describe the advent of a crisis, a moment when sickness makes a turn for the better or worse. We are perhaps safe in assuming that Donne is describing both the fate of the world and the last days of Elizabeth Drury's life. In doing so, he continues to stress the conflated condition of microcosm and macrocosm. The world experiences a consumption that turns to fever, prompting speculation that the ague is passing. As with Elizabeth, however, the world's sickness is terminal; and, without the knowledge of her heavenly and astrological progress, it will be impossible for mankind to judge the moment of crisis. Donne remarks warningly,

That wound was deepe, but 'tis more misery,
That thou hast lost thy sense and memory.
[...]
Thou hast forgot thy name, thou hadst; thou wast
Nothing but she, and her thou hadst o'repast
(Anatomy 27-28, 31-32).

Comparable to Manilius' admonition, "*nescimus credere caelo*" ("we do not know to credit the heavens") (Astronomica 76), it seems likely that, as long as the world fails to recognize the meaning of Elizabeth's ascent, it will continue to languish, and eventually expire.

Considering the implications of Elizabeth's progress on the overall meaning of the poem, the need to distance oneself from the prevailing scholarly opinion, that "Donne's persona in the *First Anniversary* is a true anatomist," becomes more apparent—especially when one limits Donne's anatomical conceit to the "struggle to dissect [...] and to find somewhere, at the core of this crumbling mass, something indivisible, something incorruptible and eternal which will survive the destruction" (Hirsch 75). Without doubt, the idea of dissection figures into the sense of the poem. To suggest, however, that *An Anatomy of the World* represents Donne's attempt to enact (poetically) the procedures of a surgeon is to pass beyond feasibility. We can agree with scholars that the poem is an anatomy, but as I have suggested above, the primary conceit of the poem appears to be the traditional "anatomie of man" found in most almanacs and ephemerides of the period. The figure of the 'world' functions as a type of microcosm, a 'zodiack-man' of sorts; and Elizabeth Drury performs the celestial movements of the macrocosm. It is from this cosmological interaction that Donne's anatomy of the world gathers meaning.

Seen as such, the poem's attention to cosmology is hardly unique. Cosmo-anatomies display a generic awareness of the ontological correspondences between the heavens and the earth. Donne's *Anatomy* is very similar in method. I would argue in fact that his poetic interests exist quite apart from any need to discuss human dissection. David A. Hirsch is correct in

attributing much of Donne's motivation to "the revival of ancient atomism around the turn of the seventeenth century" (Hirsch 69); however, he misses the mark in trying to limit the discussion to concerns about material and "bodily dissolution" (Hirsch 77). The heart of Donne's interest lies in the perceived consequences of Epicurean/Democritean atomism on a semiotically given universe.

Again Donne's topic finds similar expression in Manilius' earlier example. In the first Book of his *Astronomica*, Manilius deliberates over the various explanations offered throughout history for the origin of the universe: from "chaos," "flickering flames," "water," or "an aggregate of indivisible atoms" (*Astronomica* 15). Atomism in particular seems exceptionally repugnant to the poet, prompting him to comment:

[...] this is what he [Epicurus] would have us believe who first built the walls of the heavens from minute atoms and into these resolved them again; he held that from these atoms are formed the seas, the lands, and the stars in the sky, and the air by which in its vast space worlds are created and dissolved; and that all matter returns to its first origins and changes the shapes of things. Who could believe that such massive structures have been created from tiny atoms without the operation of a divine will, and that the universe is the creature of a blind compact? (*Astronomica* 43)

Donne's consideration of atomism is likewise skeptical, providing perhaps the most quoted lines of the poem, and the most misunderstood. Like Manilius, he positions Epicurean atomism in relation to the cosmological systems that it presumes to displace:

And new Philosophy calls all in doubt,
The Element of fire is quite put out;
The Sunne is lost, and th'earth, and no man's wit
Can well direct him, where to look for it.
And freely men confesse, that this world's spent,
When in the Planets, and the Firmament
They seeke so many new; they see that this
Is crumbled out againe to his Atomis.
'Tis all in pieces, all cohærence gone;
All iust supply, and all Relation (*Anatomy* 205-14).

In contrast with *Ignatius His Conclave*, *An Anatomy of the World* references the Copernican

controversy only obliquely. Kuhn's suggestion that Donne clearly identifies both atomism and Copernicanism as a singular idea—the “new philosophy”—seems over-stated. Far from trying to speak ‘scientifically’ about his topic, Donne employs standard poetic techniques to merge a number of contemporary theories (from various fields) under the one designation “new”—or what we might consider “innovation.” Thus Donne provides himself with a familiar trope, which he quickly positions against another metonymical category, the “Element of fire,” an emblem for all traditional cosmological systems. He explains that the fires of creation (Manilius’ “flickering flames”) are “put out” by the intellectual inertia of novel theories. In a manner reminiscent of *Ignatius His Conclave*, Donne demonstrates the potential of innovation to call “all in doubt” through its dismissal of ancient authority.

This much is fairly obvious. A lingering dilemma for Donne scholars centers on the meaning of the phrase, “calls all in doubt.” The assertion seems hyperbolic at best. Neither Manilius nor Donne appears exceptionally concerned with the idea of atoms. As mentioned above, David A. Hirsch argues quite convincingly that Donne finds comfort in the proposed existence of an irreducible substance, which provides him the “prerequisite” for the “possibility of physical resurrection” (Hirsch 86). Likewise, the respective positions of the sun and earth in a Copernican universe are not overtly troublesome in themselves. Rather, Donne’s distress issues from a shared Manilian concern, that the atomistic “universe is the creature of a blind compact.” Donne summarizes the problem in terms of the loss of “cohærence” and “Relation” in a cosmos where everything (in heaven and on earth) begins and ends by crumbling into discrete particles. For both poets, atomistic materialism represents an assault on traditional understandings of the semiotic bond of congruence, or coherence, between microcosm and macrocosm—a bond sustained here by the “Magnetique force” of *meaning-made-manifest* in the form of Elizabeth Drury (*Anatomy* 221).

Again we can look to the common almanack for answers. The ‘anatomy of man’ plays an important role in determining the vector of Donne’s argument. His audience would have recognized the narrator’s role as a type of physician, whose attempt to diagnose the illnesses of the world by consulting the signs of heaven would have referred them back to the image of ‘zodiack man.’ Donne writes:

She to whom this world must it selfe refer,
As Suburbs, or the Microcosme of her,
Shee, shee is dead; shee’s dead: when thou knowst this,
Thou knowst how lame a cripple this world is.
And learnst thus much by our Anatomy,
That this worlds generall sicknesse doth not lie
In any humour, or one certaine part;
But, as thou sawest it rotten at the hart,
Thou seest a Hectique feuer hath got hold
Of the whole Substance, not to be contrould (Anatomy 235-44).

Critics have noted that the refrain, “And learnst thus much by our Anatomy,” repeats throughout the poem. Many have suggested that Donne credits knowledge of the human interior (through dissection) as the source of his diagnosis of “this worlds generall sicknesse.” It seems likely, however, that Donne’s narrator bases his judgment on astrological semeiology, by interpreting the *ex congruo* signs of the macrocosm/microcosm—“shee’s dead: when thou knowst this, / Thou knowst how lame a cripple this world is.”

We should be careful about interpreting Donne’s use of cosmological semeiology as an endorsement of astrology, nonetheless. Richard Sugg rightly suggests that the object of Donne’s critique is the power of demystification, which Sugg mistakenly connects with human dissection (Sugg 141). It is perhaps more accurate to claim that *An Anatomy of the World* explores, from a poetic standpoint, the consequences of a materialistic system on the way humans understand their relationship to the universe. Nowhere is this more evident than when Donne discusses the effects of materialism on the semiotic processes of the artist. He complains:

What Artist now dares boast that he can bring
Heaven hither, or constellate any thing,
So as the influence of those starres may bee
Imprisoned in an Herbe, or Charme, or Tree,
And doe by touch, all which those starres could do?
The art is lost, and correspondence too.
For heaven gives little, and the earth takes lesse,
And man least knows their trade, and purposes.
If this commerce twixt heaven and earth were not
Embarr'd, and all this trafique quite forgot,
Shee, for whose losse we haue lamented thus,
Would work more fully' and pow'rfully on us (Anatomy 391-402).

Characteristically, Donne moves quite easily between seemingly unrelated statements about astrology and art. His declaration that the “influence of those starres may bee / Imprisoned” in plant life is nearly identical in principle to the assertions of astrological pharmacœpia of the period. In a passage from the *Astrological Practise of Physick*, for example, Joseph Blagrove writes: “if you find that both the Planet and plant do accord in Elemental qualities then we may conclude, that such an herb or plant is under such a Planet” (Blagrove 5). From Donne’s perspective, moreover, art exists as an extension of the same “accord” between the macrocosm and microcosm. Art relies on the ability to discover (or decipher) correspondences between discrete ideas, just as astrological medicine depends on the physician’s power to ascertain sympathies between ruling planets and their herbs. Thus Donne links the artistic mode to the existence of congruencies between the earth and the heavens, suggesting (quite forcefully) that if this semeiological “trafique” between the microcosm and macrocosm ceases, the semiotic bridge collapses, and all “art is lost.”

Donne’s solution to the problem recalls his original argument. Elizabeth Drury represents the world’s only chance for a cure, for, as Donne has argued repeatedly, it is her cosmic influence on the world that supplies the remedy:

Since herbes, and roots by dying, lose not all,
But they, yea Ashes too, are medicinall,

Death could not quench her vertue so, but that
It would be (if not follow'd) wondred at (Anatomy 403-06).

The example of Elizabeth's virtue infuses the world with medicine, even in death. Donne completes the circle of his conceit, however, referring no longer to the kinds of cures that men create from "herbes" and "roots," but to his own art as the "last, and best concoction" (Anatomy 456). Just as the Creator imprisons the influence of the stars in earthly plants, now Donne captures Elizabeth's influence in his verse:

Vouchsafe to call to minde, that God did make
A last, and lastingst peece, a song. He spake
To Moses, to deliuer into all,
That song: because he knew they would let fall,
The Law, the Prophets, and the History,
But keepe the song still in their memory.
Such an opinion (in due measure) made
Me this great Office boldly to invade.
Nor could incomprehensiblenesse deterre
Me, from thus trying to emprison her.
Which when I saw that a strict graue could do,
I saw not why verse might not doe so too.
Verse hath a middle nature: heaven keepe soules,
The graue keepe bodies, verse the same enroules (Anatomy 461-74).

Donne, the poet, finds his answer in the middle nature of poetry, which is, for him, the semeiological space of cosmological congruence. We might add here that it is precisely this poetic attitude that makes his poetry "metaphysical." Moreover, "zodiack-man" provides a perfect framework for examining the implications of a universe devoid of semiotic content. Donne's *Anatomy of the World* stands as a stark warning against the tendencies of materialist philosophies to *de-semiotize* the cosmos. As a poet, however, his central concern is not with a particular "innovator," or with "innovation" itself, but with the loss of a universe infused with meaning.

Endnotes:

¹ Wilkins' title may allude to Martianus Capella's well-known fifth-century work, *De nuptiis*

Philologiae et Mercurii, which was an academic handbook in fictionalized form. In any case, knowledge of Mercury's symbolic relation to linguistics was commonplace during Wilkins' time.

² In *Semeiotica Uranica*, Culpeper writes:

[...] the Universall cause of the Crisis is the influence of the heavens: for the Celestiall bodyes either by heat, light, motion, or aspect, configuration, or all of them, or some of them, act not onely in the four Elements, but Elementary bodyes; for if they act in the one, they must needs in the other; and then by consequence in man, which is but compounded of Elements (21).

³ *Preached in Lent, to the King. April 20. 1630. [?]*

⁴ Donne may be thinking of Boniface IV, who initiated a plan to convert the pagan temples of Rome to places of Christian worship.

⁵ "Modo enim veritas amittatur, quo id fiat modo non interest" (*Conclave Ignati* 7).

⁶ *A Funerall Elegie* (1610?), *An Anatomy of the World: The First Anniversary* (1611), and *Of the Progresse of the Soule: The Second Anniversary* (1612).

⁷ Pamela Gossin reports that Donne belonged to a circle of mathematicians and astronomers, among whom was the eminent Thomas Digges, an influential producer of almanacs (Gossin 38-39).

⁸ Donne would have had access to the Latin version of Manilius, possibly Scaliger's 1579 edition. Donne owned other works by Scaliger, so this option seems most likely. Scaliger's anti-Jesuit opinions may have influenced Donne, as well. Here I will use Thomas Creech's 1697 verse translation, the first translation to appear in English, and Goold's prose translation from the Loeb series.

⁹ *OED* 2nd ed. s.v. "progression."

CHAPTER FOUR

THE FORENSICS OF NARRATIVE: ANATOMY AND MEMORY RECONSTRUCTION IN STERNE'S *TRISTRAM SHANDY*

Sterne scholars have long been captivated by what Arthur H. Cash calls “the problem of structure in *Tristram Shandy*” (“Psychology” 125). Membership in the field of Shandean studies seems to rely, in part, on one’s initiatory attempt to reveal the logic (or illogic) behind Sterne’s narratological style. Such efforts have resulted in a vast body of scholarship, the energy of which verges on a near-occult obsession with providing a ‘key’ for the text. The organization of *Tristram Shandy* remains a challenge for academics who view the work of ‘the critic’ as a non-relenting drive toward clarification—or, as Melvyn New comments, the struggle to “establish the laws, [and] the principles [...] that will make the muddle of life and its literature *clearer*” (New 130). On all levels, however, the extreme digressiveness of *Tristram Shandy* appears to resist even the most helpful labors of scholars.

Taken together, such attempts to illuminate the ‘hidden’ structure of *Tristram Shandy* are helpful, insofar as they supply a matrix of cultural history, which in turn sheds some light on Sterne’s process. Arthur Cash’s discussion of Lockean psychology is perhaps best known for providing the template for nearly all examinations of Sterne’s methodology after 1955. Cash summarizes Lockean psychology as the production of “a continual train (or chain) of ideas” passing through the mind. He differentiates Locke’s “train of ideas” from the associationism of Hartley and Hume, which, Cash says, attempts “to explain in a systematic way *how* one idea comes to follow another.” In contrast, Locke (and by extension, Sterne) “simply asserts that they *do* follow one another in a train,” without feeling the need to offer a systematic account (Cash “Psychology” 130).

While Cash seems concerned with providing an accurate history of the intertextuality of

Tristram Shandy—he claims to be opposing interpretations that explicitly link Sterne to Locke’s doctrine of the association of ideas (“Psychology” 126)—most critical discussions of narrative structure in *Tristram Shandy* do, in fact, hinge on the associative manner in which Sterne makes his ideas flow from one to another. Like Cash, the majority of Sterne scholars have regarded digressions as individual links in the narrative chain, or as “successions” in a flux of ideas (“Psychology” 131); yet some scholars are beginning to regard Sterne’s digressive mode as a form of systematic organization.

Of course, even the term “systematic” has a variety of meanings for scholars. Jonathan Lamb reasons that Sterne’s Burton-like imitation of, and endless borrowing from, the English literary tradition generates a “system” of narrative organization (Lamb 27) intended to provide “the very means by which his [Tristram’s] own thought takes place” (23). Elaborating from the example of the *Anatomy of Melancholy*, Lamb views Burton’s type of literary “plagiarism” as a process by which “an individual can inhabit a book world and use its contents to reveal himself” (25). Lamb argues that because the use of miscellaneous sources lends itself to incoherence, Burton-the-writer feels obliged to maintain a “loose” style, which allows for “the instant incorporation of diverse materials” (25) without surrendering to the academic desire to unify knowledge in a meaningful way. We should note, however, that Lamb’s description of Burton’s method—an extension of the learned-wit tradition—better approximates the structure of compendia, than, as he suggests, systematic texts—at least not systematic in the sense that Sterne and his contemporaries would have understood it.¹ It will be necessary, therefore, to return frequently to the idea of system and organization below.

A number of critics have tried to solve the problem of structure in *Tristram Shandy* by indentifying governing structures in the text. Jeffrey Williams states that the non-linear organization of Sterne’s novel “belies a sort of deep structure of narrative reflexivity” (Williams

1036). Williams accounts for Sterne's frequent use of historical digression as a process of embedding "supporting" subplots "within the central plot": namely, Tristram's autobiography. The reflexivity of Tristram's narration, Williams argues, the constant shuffling back and forth between "past tense narration" and the "simultaneous narration" of digressive intrusion (1036), mimics the "struggle of the act of narration" itself, which stems from difficulties inherent in "marshalling sequential temporal order" (1037). Understanding *Tristram Shandy* thus becomes a matter of 'plotting' plots within the general order of the autobiography. Williams crafts a notational system, which, he says, recreates the anachronic structure of the novel, allowing one to glimpse the "static" appearance of the narration:

This sequence could then be given: E (C (Ca, A, Aa)- C (A, B)- C (A, B)- C (B, Cd)- Cs- C (Cs, A, B)- D (Dd)- B- B). The plot(s) could be reductively summarized: E (C-C-C-C-Cs-C-D-B-B), factoring out the level of narration (1040).

According to Williams's notation, "C" corresponds to the chronological space that encompasses Tristram's birth. The repetition of, and return to "C" throughout the novel demonstrates that the narrative tends to hover in the downstairs parlor (in the moments leading up to Tristram's birth). Williams admits, however, that one must "factor out the level of narration" if one wants to recognize stasis in Tristram's narrative. In other words, readers must reduce the plot to its major elements by omitting the digressions Ca, A, Aa, Cd, Dd, etc. According to Williams, the plot appears static, even though it is moving back and forth, like a rapidly "vibrating object," which "looks as if it were still" (1042). Williams calls this illusory effect of omission-by-vibration, "oscillatory" (1042).

The most obvious problem with Williams' approach stems from the fact that no such schematization exists for the reader. The ability to see the "static" quality of Tristram's narrative relies on an *above-the-text* perspective unavailable to Sterne's contemporary readers. Such a viewpoint was, in fact, impossible, given the serialized publication of *Tristram Shandy* between

the years 1759 and 1767. While it is true that one eventually grows accustomed to the oscillation of Tristram's narration, it seems rather unlikely that the frequency of Sterne's plot "vibrations" produce a sense of stasis. If this were the case for readers, there would be no ground for debate. The stasis effect is thus an illusion generated by Williams' own notational scheme. Furthermore, if Williams wishes to argue that the structure of *Tristram Shandy* corresponds to a system, digressions must play an integral role, which cannot be reduced to narratological slight-of-hand.

In "Bricolage, Analogies, and Hinges: Order in the Recombinant Universe of *Tristram Shandy*," Paul Surgi Speck describes Sterne's narratological system as a "three dimensional matrix of (1) language, (2) event, and (3) theme" (Speck 72), arranged artistically in the mode of a *bricoleur*. According to Speck, *bricolage* functions to liberate the author from the real-world, and "the limiting assumptions which underlie history and science" (67). As a method, *bricolage* tolerates the "analogic interchangeability of parts where any element, any fragment, can be linked to any other" (67). It ignores the various historical, cultural, and scientific assumptions of language, event, and theme, giving the artist imaginative freedom to "create a new order which fully serves the individual" (67). Sterne can, as a result, link noses to the reputation of great men without seeking justification from the external order. Understood in this way, the 'hobby-horsicality' of Uncle Toby and Walter Shandy's interests—the extreme subjectivity of their individual, internal order—typifies the "spirit of *bricolage*" (67). Considered as a 'system,' consequently, *bricolage* is in reality anti-systematic, ahistorical, and non-scientific. In short, its products are entirely fictional.

We observe two very different understandings of Sterne's methodology in the individual handlings of Williams and Speck. On the one hand, readers seem to require almost god-like omnipresence to recognize Sterne's system. Williams constructs a cold algorithm, massive in scale, spanning across nine volumes and eight years of serialization. In all likelihood, such an

arrangement would have never entered Sterne's imagination. Speck on the other hand frees Sterne from all reliance on the established orders of history, culture, and science. Sterne, as *bricoleur*, simply "fills his fictional world with the flotsam and jetsam of the Enlightenment" (80); in much the same way that practitioners of the postmodern 'found art' movement look to their immediate environment for material. Given the extreme configurations of both accounts, neither explanation satisfies entirely. Rather, it seems necessary to propose a third account for *Tristram Shandy's* arrangement, one that allows for the probability that Sterne did formulate some kind of narrative system—perhaps, as Sigurd Burckhardt suggests, a kind of narrative "engine" or mechanism (Burckhardt 76)²—while allowing for absolute freedom of association within the text.

Previously I described a mode of systematic organization known in the early modern period as the anatomy. Critics have been tempted to label *Tristram Shandy* an anatomy for some time now. Most scholars, however, fail to differentiate the anatomical mode fully from the Menippean satire and the Learned-Wit tradition—a trend continued in Howard Weinbrot's recent *Menippean Satire Reconsidered* (2005). As I have argued, literary anatomies are neither wholly literary in modality, nor completely medical/scientific, but represent a hybrid form—the distinguishing characteristic of which is organizational. The chief problem that the anatomical mode addresses is that of ordering a great deal of seemingly unrelated information in a coherent manner. As one solution, the anatomy adopts both a systematic and a narratological approach. Quite different from other modes of organization, the anatomical narrative follows the path suggested by the functions of its parts, rather than relying on a 'logical' or chronological sequence. As such, the anatomy often appears digressive, or excessively self-referential—in short, the organization of its parts takes place in what we might consider a three-dimensional or "superpositioned" space, and not in a strictly linear vector.

Medical anatomies remind us that the act of textualizing the body represents a challenge to traditional modes of narration. This is due in part to a high level of complex integration that spans the entire length and width of the human body. Imposing any type of ‘chronology’ on such narration is immediately absurd.³ In the end, it is the inner composition of the body itself that suggests a mode of organization by role, where the organs are arranged by their *systemic function*, and not by their placement or appearance (i.e., their taxonomic categories). In other words, the connections that exist between parts of the body do so according to their function. Consequently, for any text to be considered an anatomy—in a generic sense—it must exhibit similar (or analogous) arrangements of information.

Burton’s *Anatomy of Melancholy* exemplifies the application of anatomical organization to a literary text—so much so that it is hardly distinguishable from the medical texts that inspired its production. By the mid-eighteenth century, however, literary anatomists began to employ the anatomical mode more imaginatively, abandoning the overly procedural language of medicine, and dropping the awkward title phrasing: “Anatomy of .” In the propositional case of an anatomical novel, we can imagine that the events of the plot/plots perform and fit together like the organs of a body. Strict linear chronology slips behind the principles of systematic function. In the perhaps the most famous example of an anatomical novel—if we allow that such a thing exists—Sterne appears to advance the anatomical directive a step beyond previous examples,⁴ submitting a substantial portion of the narrative structure of *Tristram Shandy* to the organizational suggestions of physiological science.

It is clear from the work of Jonathan Lamb and others that Laurence Sterne owes a great intellectual debt to Robert Burton’s *Anatomy of Melancholy* (Lamb 24-25). The case has been made so convincingly (and so often) that I will forgo any attempt to trace the many connections. Instead, I am interested in exploring the ways in which Sterne’s novel performs as a literary

anatomy. Over the past decade a number of scholars in the History of Science have identified *Tristram Shandy* as a perfect demonstration of the influence of natural philosophy on popular literary forms. Robert Burton and John Donne have long served a similar purpose; yet, more and more researchers are beginning to look at Sterne's work for historical and cultural evidence of scientific belief in the Enlightenment period. Sterne's popularity among historians of medicine is easily explained, since at times *Tristram Shandy* reads like a medical encyclopedia.

Unlike many writers of the period, Sterne is not willing to expose his plan for the novel from the beginning. The preface does not appear until mid-way-through the third volume (published 1761), between chapters twenty and twenty-one. Apart from a brief dedication, the actual content of the novel begins with a chapter that details the strange details of Tristram's conception. Though largely comic, Tristram's description of his own *in utero* beginning is immensely important, both in establishing the anachronistic quality of the narration, and in providing a scientific foundation for Sterne's structure. I will return to the issue of structure below. First, however, there are a number of important suggestions to be examined in Sterne's frequent use of Tristram's birth throughout the novel.

One finds it quite easy to agree with Jeffery William's assessment that the actions of Sterne's plot seem to center on the events leading up to and including Tristram's birth (Williams 1040). Arthur Cash points out that these rather extensive narrative sections provide scholars with an opportunity to reconstruct a great deal of information about medical theories of conception, procedures for child delivery, and controversies surrounding the use of male and female midwives in the eighteenth century (Cash "Birth"). For critics, Sterne's tendency to *saturate* the narrative with medical matter is suggestive of an artistic plan, which he begins, as mentioned, in the first chapter.

A number of critics have commented on the role of "animal spirits" in Tristram's conception.

Most of this work has concentrated on Sterne's use of humoral psychology in characterizing Shandean eccentricity;⁵ yet animal spirits have a much larger cache of applications during the seventeenth and early-eighteenth centuries. John Sutton advances the argument in his important study of Cartesian physiology, *Philosophy and Memory Traces: Descartes to Connectionism*, that animal spirits perform a crucial role in constructing an early modern theory of memory. Sutton's assertions are not insignificant, considering the emphasis that Sterne places on memory. In fact, one of the peculiarities of *Tristram Shandy* is its absolute reliance on the memory of its narrator, in opposition to previous modes of recollection that utilize verifiable archives such as personal correspondance (the epistolary novel). From the start, Tristram professes his dependence on mental archives. He receives the account of his own birth, for example, from the archives of his Uncle Toby's memory (Sterne 1: 4-6), then filters it and accesses it from his own.

We should note, however, that the process of recollection begins with Tristram's father, Walter Shandy, who makes use of a series of mnemonics to help him remember a set of duties to clock and wife:

—he had made it a rule for many years of his life,—on the first *Sunday night* of every month throughout the whole year,—as certain as ever the *Sunday night* came,—to wind up a large house-clock which we had standing upon the back-stairs head, with his own hands:—And being somewhere between fifty and sixty years of age, at the time I have been speaking of,—he had likewise gradually brought some other little family concernments to the same period, in order, as he would often say to my uncle *Toby*, to get them all out of the way at one time, and be no more plagued and pester'd with them the rest of the month (1: 6).

One easily could attribute the incidents of Tristram's conception to Locke's "association of ideas"—arguing, it would seem, that the simple act of winding the clock triggers corresponding thoughts of the sex act in Walter's mind. Such an interpretation is not supported by the text, however. Walter *is* able to remember the responsibilities of each "first *Sunday*" by means of an association; but this connection is predetermined by the introduction of an artificial memory

mechanism—what at the time would have been called “*Artificial* memory,” or, as Ephraim Chambers defines it, a “Method of coupling or associating Ideas of Things to be remembered” (Chambers 2: 529).⁶ In short, Walter creates a mental association, or a mnemonic, to aid his memory. Tristram is thus conceived through a willed association of memory, and not by a passive psychological occurrence.

Sterne does mention Locke’s theory of associationism, but he does so in reference to Tristram’s mother. The force of Walter’s mnemonic carries to Mrs. Shandy, though in a slightly different manner. Tristram comments:

[...] from an unhappy association of ideas which have no connection in nature, it so fell out at length, that my poor mother could never hear the said clock wound up,—but thoughts of some other things unavoidably popp’d into her head—& *vice versa*: which strange combination of ideas, the sagacious *Locke*, who certainly understood the nature of these things better than most men, affirms to have produced more wry actions than all other sources of prejudice whatsoever (Sterne 1: 6-7).

It is the act of intercourse that triggers Mrs. Shandy’s mental association (by *vice versa* relation) to the clock. Thus Walter’s mnemonics appear to be the source both of Tristram’s conception and the misfortune that such an unhappy association sets in motion. For Walter, the active linkage of ideas in memory—putting them into their “different tracks and trains”—facilitates an associative function (1: 2); meanwhile, Tristram’s mother remains a passive participant in the psychological combination of unconnected ideas, resulting in the legendary interruption, “*Pray, my dear, [...] have you not forgot to wind up the clock?*” (1: 2).

According to early modern theories of physiology, animal spirits play an important role in both instances of association. Although the theory of animal spirits was “on the point of being discredited” (Smith 17) by theorists of the late seventeenth and early eighteenth centuries, for Sterne and many others, the “notion of animal spirit[s] traveling in nerve tubes [...] was simply conventional wisdom” (16). John Sutton observes, also, the persistence of traditional analogies

between the semen (Sterne's HOMUNCULUS) and animal spirits, "so that the same spirits operate in the brain and in the seed" (Sutton 43).⁷ In this context, Tristram's complaint about the "sad disorder'd" state of his father's nerves at the moment of conception sets in motion a long theoretical commentary on the brain, memory, and narrative (Sterne 1: 3). Nowhere is this more pronounced than in the events of Tristram's birth.

Ephraim Chambers remarks in the *Cyclopædia*, "Of all the Faculties, there is none harder to account for, or that has perplex'd Philosophers more, than the *Memory*" (Chambers 2: 528).⁸ The struggle to comprehend the more mysterious operations of memory often led theorists to break with traditional descriptions of the soul by assigning certain faculties to specific 'localities' in the brain. As a result, the potential physicality of mental activity is a major element of nearly all discussions of memory during the seventeenth and eighteenth centuries. Perhaps most famously, Descartes describes memory as a distribution of "*trace figures*" throughout "[the solid part] of the brain" (qtd. in Sutton 58). Over time, he argues, these traces become imprinted on the "fibrous mesh of the brain substance" (57), through the continuous motion of animal spirits flowing from the pineal gland. Once these figures have been etched in the tissue, Descartes maintains that the animal spirits have the capacity to re-trace their former channels and re-construct a memory on the surface of the pineal gland, in a process called recollection (literally the spirits re-collect over the etchings).

Sterne's knowledge of Descartes' memory theory likely begins with Chambers' *Cyclopædia*.⁹ Chambers lists only two modern sources among the ranks of ancient authority on memory, Descartes and Malebranche, suggesting the existence (at least early in the eighteenth century) of a 'common' model based on Cartesian principles.¹⁰ As mentioned, such a model depends on the establishment of a "seat" for memory, somewhere in the brain itself. Sterne appears to account for physical location of memory with the introduction of Dr. Slop and his forceps. Before we can

discuss this, however, we should consider the medical history of the brain.

In the essay, “Schemes and Models of the Thinking Machine (1662-1762),” Renato Mazzolini records Galen’s observation that “animals behave stupidly when their brains are compressed,” as early evidence of “the doctrine of the localization of the mental faculties within the cerebral ventricles” (Mazzolini 70). By the sixteenth century, however, the progressive work of comparative anatomy (the study of animal and human anatomy side-by-side) “challenged the notion that the faculties of the rational soul were located in the cerebral ventricles,” reasoning that “these ventricles in the human being are structurally similar to those of animals, to which a rational soul was, of course, denied” (71). According to Mazzolini, Descartes bypasses the problems of localization by attributing all mental faculties to a centralized interaction between the rational soul and the pineal gland, which was seemingly “more mobile in man than in other animals” (Williams 268). Descartes’ model proposes a mechanical relationship between the brain and the body, for which the pineal gland functions like an engine, distributing orders throughout the body in the form of animal spirits (71). [FIGURE 4.1] Consequently, the status of the brain shifts from merely participatory—previously it shared responsibility with the heart—to chief headquarters of all mental function. Though the majority of anatomists following Descartes reject the suggestion that the pineal gland is the “seat” of the soul—citing evidence drawn from a large number of anatomical dissections—Cartesian theories about the mechanical character of the brain find wide acceptance in models of the eighteenth century. For Mazzolini, Descartes’ lasting innovation lies more in

his having maintained that the mental faculties and the passions of human beings are fully understandable on the single condition that the body and the brain be looked upon as machines and considered within the terms of a mechanistic frame of reference (71).

In a verifiable manner then, Descartes opens the way for theories of the brain that favor “the search for physiological automatisms” (72).



FIGURE 4.1. Descartes's famous depiction of the seat of the soul. Image courtesy History of Science Collections, University of Oklahoma Libraries.

Seen in this context, Walter Shandy's lengthy account of the role of the cerebellum and medulla oblongata is particularly revealing. Tristram describes his father's disagreement with Descartes about the location of the soul "upon the top of the *pineal* gland of the brain" (Sterne 1: 173), citing a rather common objection to the Cartesian model. Tristram recalls an anecdote conveyed to his father by Toby, in which a "*Walloon* Officer at the battle of *Landen*" had a portion of his brain blown away by a musket-ball, "and another portion taken out after by a *French* Surgeon" (1: 173). Surprisingly, the officer recovers from the injury well enough to resume his duties, leading Walter to conclude: "if it is true that people can walk about and do their business without brains,—then certes the soul does not inhabit there" (1: 174).

Humor aside, the passage engages squarely with contemporary discussions about the

significance of the brain. Ephraim Chambers offers a similar line of reasoning in an extended and more explicit form:

The *Brain* does not appear absolutely necessary to animal Life. We have several Instances in Authors, particularly in the *Philosophical Transactions*, of Children brought forth alive, and surviving their Birth for some time, without any *Brain*: [...] we have a History from *Paris*, of a Child, deliver'd at Maturity; and living four Days, not only without a *Brain*, but even a *Head*: instead of both which, was a Mass of Flesh like Liver found. M. *Denys* gives us another Instance, of a Child born in 1673, which, setting aside the *Head*, was well form'd, but without any *Brain*, *Cerebellum*, or *Medulla oblongata*: It had not any Cavity for a *Brain*, the *Skull*, if such it might be call'd, being solid : Nor was this any way connected to the *Vertebrae*; so that the Marrow in the *Spine* had no Communication with the *Head* [...] (Chambers 1: 123).¹¹

Both Sterne and Chambers appear to distinguish the “Brain” from the paired “Cerebellum” and “Medulla oblongata.” For the medical literature of the period, such a distinction is more descriptive than operative. In *The Anatomy of the Brain* (1695), Humphrey Ridley concludes that the term “Brain” generally describes the cerebrum, cerebellum, and medulla oblongata; yet, when spoken of “[...] as distinct from the other two [cerebellum and medulla oblongata],” the brain “is that large and almost spherical Body [...] filling the greatest part of all that space contain'd in the *Cranium*” (Ridley 87).¹² Ridley’s “spherical Body” appears to be the same *Brain* that both Sterne and Chambers reference—in fact, Chambers’ account mirrors Ridley’s in a number of ways. Sterne differs from Chambers on one important point, however. The *Cyclopaedia* instances the case of a child born without a brain, cerebellum, or medulla oblongata, with the implication that the brain is somewhat peripheral to, or even unnecessary for, life. Such a description is problematic for Walter, who locates the “head-quarters of the soul [...] in, or near, the cerebellum,--or rather some-where about the *medulla oblongata*” (Sterne 1: 174). The distinction Walter draws between the brain and cerebellum/medulla oblongata is more than purely descriptive. One can live without “brains,” but the cerebellum and medulla oblongata are, according to the “*Shandean* hypothesis,” the “*Causa[e] sine quâ non*” of the entire system (1: 175).

Walter's conjecturing is not unprecedented (or even odd) for the period. Tristram offers no apology for his father's views, stating "there was nothing singular in my father's opinion,—he had the best of philosophers, of all ages and climates, to go along with him" (1: 175). The Shandean system deviates from other explanations, nonetheless, by emphasizing the cerebellum in the formation of intelligence. While thoughtfulness on the part of the parents (during the "act of propagation") and the conferral of a "Christian-name" appear to set the animal spirits on a positive course, these procedures are for nothing if the "delicate and fine-spun web" of the cerebellum is damaged during childbirth (1: 175). And to this end, securing the natal services of Dr. Slop signifies Walter's efforts to guarantee Tristram's safe birth, according to the rules of his system.

Arthur Cash has already shed light on the more controversial aspects of man-midwifery in the eighteenth century ("Birth" 143f). Setting this information aside, however, Cash's more important discussion centers on the use of forceps in delivering children. During the eighteenth century, even something as mundane as a physician's forceps can be made the object of theory and method. Cash describes the case of Dr. John Burton, whose newly fashioned forceps mirror those of Dr. Slop. According to Cash, Dr. Burton "provided Sterne with the materials, not only for the central birth episode, but also for the genetic and obstetrical theories of Walter Shandy" ("Birth" 138). Like Dr. Burton, Slop invents a pair of forceps to complement his views about the dangers faced during childbirth, arising potentially from the "violent compression" (Sterne 1: 175; 80) of the cerebellum by the birth canal ("Birth" 142). Burton and Slop employ their forceps in order to reduce the tremendous pressures inflicted on the cranium during birth; yet in both cases (historical and fictional) the forceps are clinical failures.

If, as Cash argues, Sterne models Slop's forceps on Burton's, the results are dramatic. In an effort to understand the context of Tristram's birth, Cash went so far as to test a version of the

historical Dr. Burton's mechanism on his hand, thereby mimicking Toby's trial of Dr. Slop's forceps in the novel. He observes:

So great is the magnification of force between the screw handle and the claw-like grips, that the operator has no sense of the pressure being exerted by the blades. The discovery was made, to my sorrow, upon the bones of my hands, which, like those of Uncle Toby's, were nearly broken [...] ("Birth" 149-50).

As Cash notes, Toby's hands fare no better after Slop's demonstration. Still, Dr. Slop disregards Walter's protest that the strength of the forceps will damage Tristram's cranium, causing Toby to remark, "I maintain it [...] would have broke the cerebellum, (unless of course the skull had been as hard as a granado) and turned it into a perfect posset" (1: 220).

Famously, Slop crushes Tristram's nose "as flat as a pancake" (1: 253). Sterne makes no mention of damage to the cerebellum, but I believe it is implied: both by Toby's observation, and by previous estimates of the average pressure exerted on a child's head during labor, which "was equal [...] to a weight of 470 pounds averdupoise acting perpendicularly upon it" (1: 176). When Slop applies the forceps, he fails to position them correctly. Instead of the blades resting horizontally along the sides of the head, they come to rest along the bridge of the nose and back of the skull, where, incidentally, the cerebellum and medulla oblongata are located. But while the natural force of labor averages 470 pounds of pressure on the skull, the force exerted by Slop's forceps appears considerably greater—enough to crush Tristram's nose entirely. Undoubtedly, this amount of pressure would have resulted in the kind of "violent compression" of the cerebellum that Galen, Burton, and Walter all fear.

If the flattening of Tristram's nose suggests evidence of additional damage to Tristram's brain (as it now seems), the structure of Sterne's narrative must be reexamined. As mentioned above, Tristram reconstructs the historical past from mental archives, which have been 'written,' or etched on the material of his brain by the motions of animal spirits. To be successful in re-

collecting the images of the past, however, his archives must remain intact. Let us assume that the biographical information in *Tristram Shandy* is accurate, or stored faithfully in the narrator's "brain"—Tristram does provide a record of his life after all. We then may turn our attention to the manner in which this information (Tristram's memory traces) is accessed and recollected. In short, we should ask: How is the act of narration altered when the neurological recall mechanism is damaged?

Sterne is careful not to disclose the full extent of Tristram's injury; although, again, the structure of the novel suggests a kind of pathological link. Tristram's excessive digressiveness may indicate a deficiency in rational control of the 'animal spirits.' Recall that Walter situates the soul in the region of the cerebellum and medulla oblongata. In fact, the entire Shandean system hinges on the preservation of the "finer net-work and texture in the cerebellum itself" (1: 175). Damage to this "net-work" would affect the functioning of the soul as well.

John Sutton indicates that fear about "the loss of sovereign control of one's own psychophysiology" ran high during the seventeenth and eighteenth centuries (Sutton 129). From the standpoint of English theorists, Cartesian/materialist models of the mind carried with them the tendency to reduce "all cognition to mere association and the chance fusion of jumbling motions" (129). Moreover, if an already disorderly mechanism were to become damaged, the soul might surrender to chance what limited power it had over the unruly 'animal spirits.' The mind would descend into chaos, and memory would become a blur of empty, uncontrollable associations. Though Tristram's case is not nearly so severe, some level of mental disruption is probable.

As a process, the reconstruction of memory faces a number of evident difficulties from the outset. Ephraim Chambers observes about Descartes's model of memory,

The chief Difficulty [...] is to conceive how such an infinite number of Things, as the

Head is stored withal, should be ranged in so much order in the *Memory*, as that the one should not efface the other: and how in such a prodigious Assemblage of Traces impress'd on the Brain, the animal Spirits should awake precisely those which the Mind has occasion for (Chambers 2: 529).

Sutton insists that Descartes recognized the problems posed by limited storage in the brain and that he tried to address the issue by arguing for the distribution of “memory traces” in “*superpositional*” patterns throughout the brain (Sutton 55). In theory, superpositioning allows the brain to ‘store’ an indefinite number of traces in the same area, without having to overwrite information. Superpositioned patterns are possible only because each memory is composed of a unique set of impressions. Due to the frequent overlapping of these traces, however, “it is all too easy for them to interfere one with another [...]. As every sensation is, in a sense, many sensations, so every Cartesian memory is many memories: the prejudices of the past are always with us, always to be detected” (62).

Though it is unlikely that Sterne would have shared Sutton’s understanding of Cartesian memory, there are elements in his narrative structure that appear similar. If we begin to think of Tristram’s narration as the textualized shape of memory—much like the anatomy is a *textualized* representation of the body—the “detours” Tristram makes throughout the history simply indicate the presence of overlapping memory traces in his brain. For most authors, such a haphazard arrangement of associations signals the lack of an editorial impulse. As readers, we expect the author’s reason to impose structure on the chaos of mental impressions, just as the soul exerts control over the animal spirits. I would argue, however, that in the absence of editorial control, memory supplies its own kind of order.

Lina Bolzoni notes that the popularity and increased use of print mediums during the early modern period had a significant impact on the use of memory and the ways that knowledge was stored. Even the simple act of writing, she argues, “diminishes the importance and sacredness

of memory” (Bolzoni 18). In oral cultures, memory serves the dual purpose of preservation and transmission of “knowledge and values” (18); but this responsibility comes at a high cost to the practitioners of the “art of memory,” who train themselves to be both receptacles and orators. Writing reduces the amount of energy required to preserve information by using a more static medium than the mind. If, however, the transition from an oral to a writing culture “leaves a profound mark” (19) on the art of memory, conversion to print culture changes things entirely: “simultaneously extending the art of memory and undermining its foundations” (22).

Eighteenth-century novels take notice of the interplay between memory, writing, and print in a way that demonstrates an understanding of exactly what is at stake. As with other narratives, the events of the epistolary novel occur in the past; but unlike oral narratives, the author/editor has a physical record from which to reconstruct/reproduce them. Authors of early epistolary novels claim to employ print technologies for the sole purpose of “reproducing” hand-written histories. It seems that the simple act of printing correspondence (even fictional correspondence) has a kind of authenticating effect. Memories become more permanent, and thus more accurate. This claim is an illusion, of course.

Sterne is not the first author to abandon the epistolary model, but *Tristram Shandy* does seem to represent an attempt to tweak the expectations that readers have about the “accurateness” of the narrative. Beyond a few documents here and there—Yorick’s sermon and Slawkenbergius’s tale for example—Tristram has very little written history on which to base his autobiography. Instead, he relies on memory to reconstruct the past. Thus, Sterne takes a step back from the epistolary novel, and a step toward mental archives and the “art of memory.” Likely, this is why he begins his autobiography with an account of Walter’s mnemonics.

In another way, however, Sterne’s “mnemotechnics” are suggestive of the relationship between word and image in the anatomical mode. Medical anatomies utilize the “combinative

logic” of “associations” (Bolzoni 19) to record large amounts of information in a manner that facilitates recollection. They accomplish this task primarily by adopting the structure of the body as an organizational metaphor; but also, anatomies rely on close associations of the text with plates—or “memory images”—to demonstrate graphically the “hidden connections” of the human interior (23). Vesalius considered mechanical correlations between text and image essential for memorizing human anatomy well enough to practice medicine without fear of “error.” Consequently, anatomical texts function like mnemonic engines, formatting vast bodies of knowledge for memory encoding.¹³ This is not to say that anatomies seek to replace memory with text and image, as encyclopedias tend to do. Rather, the anatomical mode initiates collaboration between memory/text/image.

Sterne appears at times to be reverse-engineering the narrative structure of *Tristram Shandy* from existent models of associative memory. As suggested above, the digressive arrangement of Sterne’s narrative indicates the superpositional activity of Tristram’s memory, which endlessly layers the past in a single space. In addition, Sterne devotes a great deal of time to examining the processes by which the events of one’s history first become “etched” in the memory:

There are some trains of certain ideas which leave prints of themselves about our eyes and eye-brows; and there is a consciousness of it, somewhere about the heart, which serves but to make these etchings the stronger (Sterne 1: 413).

Not surprisingly, uncle Toby plays an important role in Sterne’s exploration of memory and recollection. Tristram’s frequent attempts to account for the “perplexities” (1: 100) of Toby’s militaristic associations illustrate the importance of superimposed memory on narrative.

Like Walter, Tristram questions whether or not his uncle’s brain is “so full of saps, mines, blinds, curtains, and such military qualifications” that it can no longer accommodate new ideas (1: 279). The suggestion is reminiscent of Chamber’s concern for finite space in the brain: How does one make space for new ideas when the old have filled the head to its capacity? Tristram

concludes, however:

—thou wilt drop a tear of pity upon his scarp and his counterscarp;—his glacis and his covered-way;—his ravelin and his half-moon: 'Twas not by ideas,——by heaven! his life was put in jeopardy by words (1: 100-01).

To be precise, Tristram complains about the “unsteady uses of words which have perplexed the clearest and most exalted of understandings” (1: 100). If one extends Tristram’s meaning, however, it becomes evident that Toby’s difficulties do not arise from the mixed signification of words themselves, but from his tendency to associate Walter’s words with his own stock of memories and experiences. Toby is not incapable of entertaining new ideas, as his brother suspects; rather, his conceptual understanding has become entangled with the ‘old’ supplies of memory.

Toby’s mental confusion stems from an unlikely source: a wound to his groin. The wound makes such a mental impression that, in a functional sense, Toby’s memory begins and ends with the siege at Namur. The events of his life orbit around the perpetual remembrance of that single moment, as though the immense “gravity of the stone” extended to Toby’s brain (1: 88). Descartes describes a similar phenomenon, observing that in select moments when the “shape of one particular object is imprinted [in the brain] more distinctly than that of any other,” the animal spirits cannot help but retrace/recall that impression involuntarily.¹⁴ Furthermore, because the animal spirits etch memory traces in the brain superpositionally, “past things sometimes return to thought as if by chance [...] and without the memory of them being excited by any object impinging on the senses” (qtd. in Sutton 61). Thus one can explain the majority of Toby’s *HOBBY-HORSES* as a consequence of memory imposition: from involuntary outbursts of *Lillabullero*, to his interest in *PARABOLAE* and *HYPERBOLAE*.

During the four years of confinement that follow Toby’s return from Namur, the past, the wound, and its cure collapse into the singular act of self-narration. In a very real way, Toby

suffers as much, if not more, from a failure to faithfully reconstruct the past, as from the wound to his groin. Tristram remarks:

The history of a soldier's wound beguiles the pain of it;—my uncle's visitors at least thought so, and in their daily calls upon him, from the courtesy arising out of that belief, they would frequently turn the discourse to that subject,—and from that subject the discourse would generally roll on to the siege itself.

These conversations were infinitely kind; and my uncle *Toby* received great relief from them, and would have received much more, but that they brought him into some unforeseen perplexities, which, for three months together, retarded his cure greatly; and if he had not hit upon an expedient to extricate himself out of them, I verily believe they would have laid him in his grave (Sterne 1: 88-89).

Tristram credits Toby's inability to heal to “the almost insurmountable difficulties he found in telling his story intelligibly” (1: 94). In this manner, Sterne installs an analogy between the act of narration and the medical treatment of Toby's wound. Toby tries to narrate the events of the siege at Namur in a chronological manner, but he finds himself perplexed by the intricate details of time and location. Tristram writes,

—the ground was cut and cross-cut with such a multitude of dykes, drains, rivulets, and sluices, on all sides,—and he would get so sadly bewilder'd and set fast amongst them, that frequently he could neither get backwards or forwards to save his life (1: 95).

For Toby, the narrative act breaks down as events cross paths with various layers of historical detail. His memories of Namur remain intact in the ‘brain’; but, in order to reconstruct them, Toby feels compelled to exfoliate the strata of superimposed information, one detail at a time. This approach results, of course, in a fundamentally digressive account, jumping “backwards” *and* “forwards”—or wherever the superposition of memory traces takes him.

Sterne's depiction of the trenches and ditches at Namur is reminiscent of many anatomical descriptions of the folds and vessels of the brain.¹⁵ In his *Anatomy of the Brain*, Humphrey Ridley encounters so much difficulty in describing the branching organization of vessels in the brain that he is willing to make use of “digression” as, simply, the “order of the [anatomical] method” (Ridley 32). In a fashion not unlike Ridley's network of vessels, seventeenth-century

maps of the siege at Namur reveal complex systems of trenches, ditches, dykes, and rivulets cross-cutting the terrain. [FIGURES 4.2 & 4.3] One can appreciate the extent of Toby’s perplexity in trying to retrace his approach to the fortifications from ground level. Simply navigating the trenches from memory presents a serious challenge; yet, Toby’s difficulties are made worse by the sheer amount of supplementary information involved in reconstructing the scene, in an effort to make “his company fully comprehend where and what he was about” (Sterne 1: 94). Speaking figuratively, re-visiting the siege grounds in one’s memory is a mnemotechnical practice that parallels the movements of the animal spirits retracing their paths along the vessels of the cerebellum. As Descartes suggests, however, a single memory trace has the power to stimulate any number of additional traces that happen to be imprinted superpositionally in the same location. As such, Toby cannot navigate the trenches at Namur without discoursing on “the differences and distinctions between the scarp and counterscarp,——the glacis and covered way,——the half-moon and the ravelin” (1: 94). Toby’s narration (like Ridley’s) falls prey to the



FIGURE 4.2. Detail of trenches from “Plan de la Ville Ouvrages et Chateau de Namur.” Courtesy of the Biblioteca Nacional Digital, Biblioteca Nacional de Portugal. <http://purl.pt/index/geral/PT/index.html>

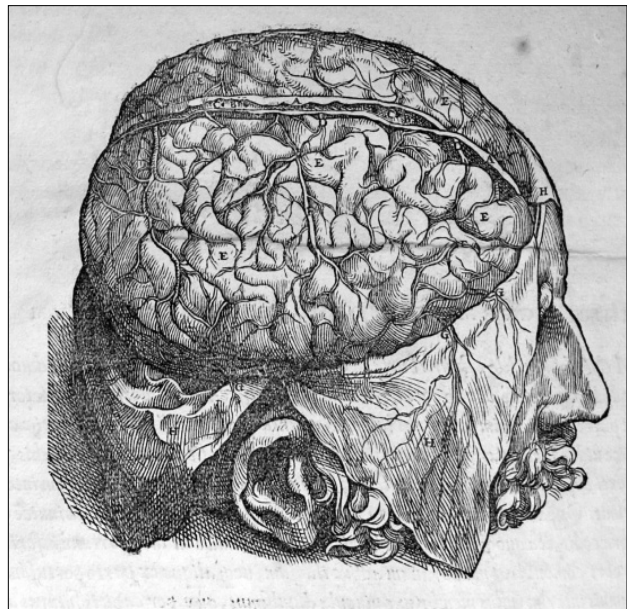


FIGURE 4.3. Vessels and folds of the brain from Vesalius’ *De fabrica*. Image courtesy History of Science Collections, University of Oklahoma Libraries.

forced “order” of digression.¹⁶

It should be evident now that Tristram’s interest in his uncle’s “perplexities” is not without its own structural purpose. Digressions appear to have two levels of functionality in *Tristram Shandy*. Discussions of the first function—digression as a meta-narrative device—have dominated Sterne scholarship for over five decades. Indeed, few alternate explanations for Sterne’s occasional narrative interruptions carry weight with modern critics. The second level of functionality is, as I suggest above, pathological—or resulting from a biological mechanism. Toby’s digressions clearly represent the latter category; in Tristram’s digressions, however, we detect a mixture of meta-narratological function and pathologic compulsion. Regarding the former, we can agree with Thomas Keymer’s observation that Sterne is an author consciously “re-working [...] the metanarrative chapters of *Tom Jones*,” thereby undercutting “Tristram’s claim that his work is *sui generis*, ‘a species by itself’” (Keymer 49). If, however, any portion of the narrative structure has pathologic origins, *Tristram Shandy* introduces a new element to the history of the novel.

Tristram first discusses the scheme behind his textual arrangement in the thirteenth chapter of the first volume—quite early in the writing process. Here he begins his attack on the “straight line,” an assault that will continue throughout the autobiography. An historian, as Tristram alleges, cannot “drive on his history, as a muleteer drives on his mule,—straight forward [...], without ever once turning his head aside either to the right hand or to the left” (Sterne 1: 41). In fact, linear endeavors are impossible “if he is a man of the least spirit,” who “will have fifty deviations from a straight line to make with this or that party as he goes along” (1: 41). Tristram’s remarks imply that only individuals completely lacking in “spirit” can proceed in a straight line, since having even the smallest measure causes men to digress to the left and right of their subject. Seen in this context, “spirit” seems to insinuate, once again, the dominating

influence of the “animal spirits,” whose movements run counter to the linear course of reason. Though Tristram often pleads with his reader to appreciate the level of editorial skill needed to master digression (1: 80), in reality the compulsive force of the animal spirits—a force that drives him to so many “unforeseen stoppages” (1: 42)—constantly undermines his argument. Each digressive turn has an accidental cause in the memory; and if “a man of the least spirit” cannot help but to digress, a man ruled by the animal spirits can do nothing else.

Here, I believe, we must draw a distinction between the interruptions of the author and those of the narrator. Thomas Keymer observes that the “protracted and erratic accumulation of its original volumes, and the protracted and interrupted experience of its original readers, have major interpretive implications” for *Tristram Shandy* (Keymer 85). Undoubtedly, the “mechanism of serialization” (86) would have provided Sterne an opportunity to read and respond to the criticisms (and approvals) leveled by his readers. Consequently, Sterne seems at times unable to resist the temptation to comment on his own narrative process. The “Author’s Preface,” which appears between chapters twenty and twenty-one of the third volume, gives the impression of such an instance. For a brief moment, Tristram’s familiar voice recedes behind that of the “Author,” who addresses himself to the “Anti-Shandean, and thrice able critics, and fellow-laborers” (Sterne 1: 228). Of course, it would be a mistake to conclude that the Author and Sterne are the same; yet the author’s preface demonstrates a secondary perspective quite apart from the concerns and personality of the accepted narrator. The ‘Author’ offers an apology for his work, commenting, “when I sat down, my intent was to write a good book” (1: 227). With this sentiment he shifts his attention to the critic—to whom he explains his methods—not just in the preface, but also throughout the text. Tristram’s digressive energies bend, in contrast, toward the primary goal of providing a history of his life and opinions (1: 9). His digressions are not meta-narratives; rather, they issue, like Toby’s, from the superpositional “order” generated by

memory, ultimately giving specific shape to the narrative itself.

In recognition of this fact, Tristram famously draws a series of lines to characterize the movement of his narration. That these lines are somehow linked to memory reconstruction is made evident by a rather obscure remark:

I am now beginning to get fairly into my work; and by the help of a vegetable diet, with a few cold seeds, I make no doubt but I shall be able to go on with my uncle *Toby's* story, and my own, in a tolerable straight line (2: 570).

The editors of the Florida edition note Cheyne's recommendation that the "seeds of the cucumber, gourd, pumpkin, etc." can be used "to cool the blood and compose the passions" (3: 441); however, they fail to record the exact affliction being treated.¹⁷ According to Lina Bolzoni, the general theory of temperaments gave rise to a number of "medical prescriptions [...] to improve memory," all of which were "based on the idea that the function of memory has a precise location in the brain, while at the same time involving the whole organism" (Bolzoni 19).¹⁸ Though Cheyne's seeds are an obvious signal of the theory of temperaments, Tristram's extrapolation about the benefits seems to verify Bolzoni's claims about their affect on memory. If a "vegetable diet" can improve memory, Tristram stands a chance of reconstructing the past in a "tolerable straight line." Of course, such a statement confirms that Tristram's digressions are somehow the consequence of a disordered brain (in this case resulting from an imbalance in the body).

The narratological lines themselves tell the story of a brain that cannot "edit" its own impulses. Tristram confesses his own inability to *draw* a straight line without the help of a "ruler" (Sterne 2: 572). Here of course, we encounter Sterne's satiric wit: Tristram will not report his life in the accepted novelistic mode of Richardson's moral tale, which confuses the straight line with the "*right line*"—the "path-way for Christians to walk in!" (2: 572). Sterne's desire to 'innovate' leads him to experiment with alternate modes of narration; yet, as Thomas Keymer

shows, Sterne counters the need to produce something ‘novel’ by looking to the examples of past innovators: “Rabelais, Montaigne, Cervantes, and Burton” (Keymer 6). Burton in particular seems to exert a major influence on Sterne’s attempts to produce an innovative structural method, leading many critics to apply the term “anatomy” to *Tristram Shandy*.

To label Sterne’s narrative structure *anatomical* may be a slight oversimplification, however. Certainly the willingness to digress is a major component of the anatomical mode, since the body is not a linear, but a three-dimensional structure. The anatomical mode exists as an answer to an organizational dilemma: namely, how does one explain the processes of an integrated mechanism, which (in terms of sequential order) has neither beginning nor end? The solution for anatomists is a structure that recognizes the importance of the *part* in functional relation to the *whole*. In other words, anatomies employ a unique kind of physical ‘logic’ that mimics proximal and functional associations within the human body; and because these associations take place in three-dimensional space, this physical logic is non-linear and free-ranging. Thus (extending the analogy a bit further), anatomical digressions are natural and predictable ‘distortions’ of the narrative, which form when ‘three-dimensional’ mechanisms are charted in ‘two-dimensional’ space. We witness a similar phenomenon on traditional Mercator maps, where the compression and expansion of an object’s scale creates a distortion. Painters call these irregularities *perspective projection distortions*. They occur on maps when the spherical data of a globe is superimposed on a flat surface. [FIGURE 4.4] Likewise, digressions in the anatomical mode represent an effort to reduce the complexities of an integrated physical system (its systematic perspective)¹⁹ to the margins of textual description. All such ‘flattening’ of information tends to cause data to overlap, or distort, in a two-dimensional medium.

As noted, Sterne’s narratological approach has many elements in common with the anatomical model. His emphasis on memory as a primary source—specifically the associative process of



FIGURE 4.4. “A new general chart of the world.” A Mercator projection-style map produced in London (1787), by William Fadden (1749-1836), showing the distortions that occur when a three-dimensional object is ‘projected’ onto a two-dimensional surface. Image courtesy of the Biblioteca Nacional Digital, Biblioteca Nacional de Portugal. <http://purl.pt/index/geral/PT/index.html>.

memory reconstruction—works to superimpose the narrative structure of the novel, chapter by chapter, much like Burton’s arrangement in *The Anatomy of Melancholy*. In *Tristram Shandy*, however, chapters represent the erratic patterns of ‘animal spirits’ during the process of recollection. The text itself is a projection of memory reconstruction, mapped (flattened) by Tristram in an effort to establish some “faint temporal order” within the “material flux” of the brain (Sutton 49). The digressive connections that Tristram makes in organizing his autobiography are actually reconstructive of the original, layered contexts of past experience, which are ‘stored’ throughout the three-dimensional space of the brain. Because the novel is a flattened representation of memory, however, digressions appear as natural distortions in the expected linearity of the text.

Sterne’s digressiveness goes far beyond the playful posturing of the Learned Wit tradition,

known for its “disrupted forms and self-conscious literariness” (Keymer 24). Unquestionably, Sterne is aware of the “literariness” of his novel; yet, unlike previous models of Learned Wit, the organization of Sterne’s novel is not rooted in its (inter)textuality. Sterne owes an obvious debt to Montaigne, Burton and Cervantes, but I would argue that this balance has been overstated (or at least miscalculated). To an extent, Sterne is attempting to do something quite opposite from the learned wits: namely, to disconnect narrative from the text-as-source by looking to physiological processes for an organizational paradigm.

Thomas Keymer is quite right when he comments, “Sterne’s primary interest [...] is with large questions about the novel and its mechanisms” (Keymer 16). *Tristram Shandy* demonstrates typical Enlightenment enthusiasm for mechanical devices, from clocks, drawbridges, artillery, and forceps, to physiological mechanisms like conception and Uncle Toby’s uncontrollable whistling. It should come as no surprise then that Sterne presents the brain as a kind of memory engine. Neither is it unexpected that Tristram’s narration (emerging from memory) assumes the structural qualities of that machine:

I have so constructed the main work and the adventitious parts of it with such intersections, and have so complicated and involved the digressive and progressive movements, one wheel within another, that the whole machine, in general, has been kept a-going (Sterne 1: 81-82).

Still, the reader is left to wonder about the degree to which Tristram’s narratological organization is a factor of physiological and pathological causes (as the text seems to imply), or (as he claims) a “contrivance” of the author (1: 80). The answer to the dilemma lies, I believe, in the attendance of a bifurcated narrator (Tristram/Author), and Sterne’s seeming inability to maintain the illusion of his own experiment. Always, the artistic desire to innovate is undercut by a human need to be understood and recognized. In addition, Sterne must account for (ironically) the forgetfulness of his audience, for whom the novel is a series of “irregularly published” fragments (Keymer

85). Gentle reminders from the author thus intermingle with the autobiographical voice of the narrator. As such, memory is implicated not only in the structure of the narrative, but also in its successful reception.

This is not to say that Sterne ever appears wholly convinced that words are capable of representing the life and opinions of his narrator. He exhibits a latent skepticism about the ability of a text to organize the apparent chaos of the brain. At best it seems that man has the capacity to construct systems, with which he can re-present the contents of his mind. In this context, systems denote the effort to edit, or organize data into a meaningful form. The “*Shandean System*” (Sterne 1: 76) is an example of such a construct, and a clear indicator of its imperfections. Naturally, Tristram appreciates the potential for error in “systematick reasoners” like his father, who “move both heaven and earth, and twist and torture every thing in nature” to support their hypotheses (1: 65). Systems are artifacts of the rational soul—and if all-mighty reason is subject to the influence of a HOBBY-HORSE, so is the system.

To further complicate the matter, Tristram appears to have difficulty in exercising editorial control over his recollection of the past. He seeks, as a result, to find an alternate method for relating his history. Ultimately, dependence on the ‘physical logic’ of associative memory allows Tristram to surrender the composition of his autobiography to the superpositioned order of the animal spirits. In this fashion, Sterne grants himself freedom to experiment with the mechanisms of narratological structure: specifically, the unavoidable distortions that occur during the process of projecting the real world onto the flat surfaces of the novel.

Endnotes:

¹ Bernard Greenberg regards Chambers *Cyclopædia* as a major source of information for Sterne. He writes, “[...] when Sterne sat down to write a chapter of *Tristram Shandy* and memory provided suggestions but failed to supply details he knew where to turn—and it was to Chambers” (562). Bernard L. Greenberg, “Laurence Sterne and Chambers’ Cyclopædia,” *Modern Language Notes* 69.8 (Dec. 1954) 560-562.

² While I do not agree with Burckhardt's speculations about the role of the *law of gravity* in Sterne's organization, his observation about mechanisms in the eighteenth century are noteworthy: "Engines and devices pervade the whole novel; they are second only to sex in supplying the metaphorical substance, and even sex appears a good deal of the time in the metaphor of engines and mechanics of war. [...] The mechanical turn of mind goes deeper: Walter Shandy's typically 18th-century enthusiasm for "projects" and his faith in contrivances and systems are the most obvious instances" (76).

³ I am thinking specifically of arranging narration according to the chronology of a demonstration of dissection, as Vesalius does. Writing an anatomical text always begins with the questions: "Where do I start, and where should I end?" In traditional accounts, dissection began with the viscera and proceeded outward. The order of the narration arose from observations that the organs of viscera are the first to deteriorate. By removing the viscera, the anatomist extended the amount of time that it takes for the rest of the body to decay.

⁴ For a detailed examination of the numerous novels, from which Sterne drew considerable inspiration, see the first two chapters of Thomas Keymer, *Sterne, the Moderns, and the Novel*, (Oxford 2002).

⁵ The note (1.16) on animal spirits in the Florida Edition of *TS* cites various definitions from Burton, Chambers, and Cheyne—all of which focus on the influence of spirits on the humoral formation of the individual (Sterne III.41-42).

⁶ *Cyclopædia*, s.v., "Memory."

⁷ Sutton comments suggestively, "Combined with the belief that the brain was the origin not only of animal spirits, but also of semen [...], this encourages the assumption of an equivalence between intellectual and sexual capacities, at least in men" (43). This information sheds new light on a host of related issues in *Tristram Shandy*, from the nature of Uncle Toby's wound/intelligence, to Walter's systematic approach to sex and birth.

⁸ *Cyclopædia*, s.v., "Memory."

⁹ Chambers writes, "*Des Cartes* and his Followers maintain, That the animal Spirits exciting a Motion in the most delicate Fibres of the Brain, leave a kind of Traces or Footsteps, which occasion our *Remembrance*. Hence it happens, that by passing several times over the same things, the Spirits becoming accustom'd to the same Passages, leave them open, and so make their way without any Effort or Labour; and in this consists the Ease wherewith we recollect such Ideas" (2: 528) [*Cyclopædia*, s.v., "Memory"].

¹⁰ While undoubtedly a great number of memory models were being explored during the late seventeenth and early eighteenth centuries, Sterne's familiarity with the larger debate remains unknown. I demonstrated above that much of Sterne's technical knowledge of contemporary scientific issues derives from Chambers, though it is likely that Sterne had access to a number of related sources, including Descartes's *L'Homme*. In short, it is difficult to estimate the range

of Sterne's reading on the subject; yet, from the standpoint of rhetoric, Chambers clearly demonstrates the metonymical value of Cartesian science in this period. Nearly all discussions of memory acknowledge a debt to Descartes.

¹¹ *Cyclopædia*, s.v., "Brain."

¹² Ridley, the first to produce an anatomy of the brain in English, refers to the cerebrum. The frontal and parietal lobes of the cerebral cortex are the first portions exposed during dissection.

¹³ Bolzoni is describing Giulio Camillo's memory theater, which acts as "a kind of universal library, a machine that encompasses all knowledge to restore it to the user, ready for use" (23). Though one could argue, on a pedagogical level, the Anatomical Theater accomplishes a similar feat, I believe that infrequency of demonstration and difficulty in actually observing the details of a dissection, prevent any reliable level of memory reception. The anatomical text, on the other hand, because of its portability, comprehensiveness, and ease of reference, provides greater mnemonic potential.

¹⁴ Chambers quotes a similar comment from Descartes: "Further, as the animal Spirits act sometimes more briskly, and sometimes more languidly on the Substance of the Brain; and as sensible Objects make much deeper, and more lasting Impressions, than the Imagination alone; 'tis easy, on this Scheme, to conceive why we don't remember all Things alike: Why a Thing, for instance, seen twice, is represented more vividly to the Mind, than another seen but once" (Chambers 2: 529) [*Cyclopædia*, s.v., "Memory"].

¹⁵ In his *Supplement to the Cyclopædia* (vol. 1, 1753), Chambers records details about Leuwenhoek's microscopic observations of the brain's surface and interior [*Supplement*, s.v., "Brains *microscopically examined*."] Of course, Leuwenhoek's work with microscopy (along with Hooke's) changed the way that many physicians (and artists) thought about the structures and functions of the human interior.

¹⁶ It is interesting to note that Toby's recovery begins with the introduction of sources outside memory: the map of Namur, and the scale model on the bowling green. Both sources function as memory replacements, or as material analogues to mental representations. Thus, Toby sidesteps the digressive tendencies of recollection by replacing mental processes with physical mechanisms. This is a trend that will continue throughout the eighteenth and nineteenth centuries.

¹⁷ See note "570.6-7" in the Florida Edition.

¹⁸ Bolzoni makes a rather suggestive comment, in the context of Sterne scholarship: "Linked to the theory of temperaments, such prescriptions involve the taking of drugs and actual medicines, but also advise on ways of eating, sleeping, bathing, and making love" (19). It remains to be seen if Walter's system of love-making is in fact related to the improvement of memory, beyond the obvious mnemonic functions.

¹⁹ The phrase "systematic perspective" denotes the capacity to imagine a complex system in its

integrated wholeness, without 'misrepresenting' any aspect. Two-dimensional representations distort systematic perspective in an obvious manner. Distortions of this type tend to give a false sense of the system and the relations between its parts.

CHAPTER FIVE

ANATOMY AND THE ENCYCLOPEDIA: CHARTING THE “WILDERNESS” OF KNOWLEDGE

The terms ‘anatomy’ and ‘encyclopedia’ have come to refer to an expansive set of literary and scientific productions throughout the course of the early modern and Enlightenment periods. For many, the two words function as near synonyms of structural intent. To be anatomical in approach is equivalent to being encyclopedic (or at least compendious) in scope, and vice versa. Generic conflation of this type seems justified in the existence of specific productions like the universal dictionaries of the seventeenth and eighteenth centuries; however, scholars should be hesitant to use the terms *anatomical* and *encyclopedic* interchangeably. Just as the two disciplines, Anatomist and Lexicographer, are not immediately connected, the structural relationship between the two modes was not always apparent (if indeed it is now).

In this essay I explore the organizational similarities between anatomical and encyclopedic modes of the seventeenth and eighteenth centuries. An important aspect of my argument will hinge on Gottfried Wilhelm Leibniz’s plan for a universal encyclopedia of the sciences and his idea of a universal library. In addition, I will detail the intellectual and textual arrangements of such landmark works as Pierre Bayle’s *Dictionnaire*, Ephraim Chambers’ *Cyclopædia*, and Diderot’s *Encyclopédie*. Building on an understanding of systematic organization as expression of the dissected structure of anatomical texts, I argue that it is possible to classify Enlightenment encyclopedias as an extension of the early modern anatomical genre. Ultimately I reveal in fundamental ways, the manner in which encyclopedists—faced with the task of compiling impossible amounts of information—look to anatomists as a paradigm of analysis and arrangement.

The term encyclopedia in its original describes the ubiquitous ‘manuals of instruction’

employed by the Greeks to “provide an all-around education within the bounds of a single work” (Collison 21). At its generic core, the encyclopedia is a structure created for the purpose of storing and organizing large amounts of seemingly independent information. Early Greek examples of the encyclopedia exist as records of the educational approaches of individual academies. Among the many compilations of this type, Aristotle’s *Organon* is undoubtedly the most famous and influential. Archives of this kind tend to survey a nucleus of information (a kind of ‘core curriculum’ compiled from the philosophical, ethical, mathematical, and political teachings of a philosopher or academy), upon which a student was expected to develop his intellectual life. The structure of these encyclopedias is rather loose. The *Organon*, as we know, is simply a collection of lecture notes from Aristotle’s students, brought together by the Peripatetics, with the principle motive of compiling Aristotle’s logic. The organizational scheme of most early encyclopedias conforms, likewise, to the pedagogical structure of a school or individual lecturer. Eventually, however, it is the systematic approach to organization that differentiates the encyclopedia, as a specialized form, from all other compendia.

In a sense, all innovations to the encyclopedic genre hinge on the introduction of new logical arrangements. The first real advance in the encyclopedic plan occurred in the work of Marcus Varro’s (116BC - 27BC) *Disciplinarum libri IX*. Robert Collison stresses that Romans regarded the collection and arrangement of information in a different light than the Greeks. The desire to accumulate all known scholarship and to “present it in the shape of letters or books that could be read independently of any series of lectures or of any instructor” (23) ran part and parcel with the imperial mandate. Localized encyclopedias of individual philosophers or academies fell short of Roman ambition, leading Roman scholars to develop their own methods. No longer dependent on the imposed structure of a single oral record, therefore, Varro was free to arrange the content of his encyclopedia as he saw fit.

Varro's organizational plan includes the distribution of *Disciplinarum libri IX* into nine books, each addressing a different topic: grammar, logic, rhetoric, geometry, arithmetic, astronomy, music, medicine, and architecture (23). Noticeably, for modern readers, the first seven books of *Disciplinarum libri IX* separate the categories of human knowledge into the traditional liberal arts. This formulation proved exceedingly successful in the Christian West (especially among the scholastics), setting the stage for the development of the trivium and quadrivium in medieval curriculae, and shaping the core of nearly all encyclopedic ventures for the next seventeen centuries.

Building on the Church's critique of Varro's division of knowledge, however, medieval scholars argued that the study of theology and the scriptures ranked above the liberal arts, both in terms of importance and authority (44). This move effectively repositioned the traditional sciences, as the Greeks and Romans understood them, below divine matters, or metaphysics. The "task of medieval thought," writes Ernst Cassirer "consisted largely in tracing the architectonics of being and in delineating its main design" (Cassirer 39). Consequently, metaphysics held precedence over the earthly suggestions of natural phenomena, which often fell short of divine truth. With few exceptions,¹ the basic organizational principles of the encyclopedic venture remain faithful to this separation of the sacred from the secular throughout the medieval period. In the wake of the Scientific Revolution, however, opinions about the proper arrangement of knowledge begin to shift from the broad claims of theology and religion to more the verifiable declarations of nature.

In the *Preliminary Discourse* to the *Encyclopédie*, d'Alembert credits Francis Bacon with the first modern innovation in the arrangement of the sciences. In *The Great Instauration* and *Novum Organon*, Bacon outlines the new system of analysis that he had developed in an earlier work, *The Advancement of Learning*. Bacon positions his system in direct conflict with the traditional

Peripatetic logic of the scholastics, which proceeds from general axioms to more specific instances by way of deduction. Bothered by the abstractions of syllogistic logic—“which will never lead to nature,” but instead generate “empty notions” (“Instauration” 20)—Bacon proposes the use of a new “kind of logic” (“Instauration” 19) to analyze individual experience, “take it to pieces,” and “by a due process of exclusion and rejection” lead to “an inevitable conclusion” (“Instauration” 20). Famously he names this inductive method the “Interpretation of Nature” (“Instauration” 19).

Demonstrations from Nature are fundamental to Bacon’s analysis. He claims that it is in the “genuine light” (“Instauration” 22) of natural phenomena that philosophy finds a corrective supply of information. Against scholastic logic and argumentation, ancient authority, and the deficiencies of sense, Bacon argues for a method built on the discovery of causes from “experiment” (“Instauration” 22-23). He writes scathingly:

Those [...] who aspire not to guess and divine, but to discover and know, who propose not to devise mimic and fabulous worlds of their own, but to examine and dissect the nature of this very world itself, must go to facts themselves for everything (“Instauration” 23).

According to Bacon, such an examination and dissection of the world yields a “natural history,” which, if written, will “supply a suckling philosophy with its first food” (“Instauration” 24).

Repeatedly, Bacon conceives of inductive analysis as a kind of dissection of experiential knowledge. His comparison is apt on a number of counts. The relatively new science of anatomy set an important precedent in the early modern period, beginning with Vesalius’ attack on the ancient authority of Galen.² In *De fabrica* (1543), Vesalius attempted to put an end to the repeated transmission of traditional errors by publishing the evidence of first-hand observation and experimentation. More importantly, the example of Vesalius’ work made possible a number of innovations in the science of anatomy throughout the sixteenth and seventeenth centuries,

including those of Bacon's contemporary, William Harvey,³ whose announced discovery of the circulatory system in 1616 predates the publication of *The Great Instauration* and *Novum Organon* by only four years. Bacon, in fact, refers to anatomy in *Novum Organon* as an analogue to the inductive process, contrasting the physical precision of dissection with the ethereal abstractions of metaphysics. In this manner, knowledge itself takes on a kind of materiality: the body of Nature gives way to the knife of logic. Bacon writes:

The human understanding is of its own nature prone to abstractions and gives a substance and reality to things which are fleeting. But to resolve nature into abstractions is less our purpose than to dissect her into parts; as did the school of Democritus, which went further into nature than the rest. Matter rather than forms should be the object of our attention [...]; for forms are figments of the human mind [...] (“Novum” 53).

The title of Bacon's work takes advantage of an old comparison between the inner arrangement of the body (i.e. “organ,” “organization,” “system”) and Aristotle's collected system of logic (the ubiquitous *Organon*),⁴ introducing a line of argument from which he can simultaneously reference the Peripatetic ‘problem’ and suggest a new *organizational* approach. Anatomy—the methodology of which had been established throughout Europe by this time thanks to the dominance of Italian medical universities—becomes an intellectual platform for Bacon's method of analysis. As such, the systematic organization of information is key to Bacon's new logic—a fact that has an enduring effect on the dictionaries and encyclopedias of the coming century.

Bacon sets in motion a critique of Aristotelianism that would continue to grow in continental Cartesianism and, later, Spinosism. At stake in the controversy was the uncontested authority of traditional scholastic philosophy and theology, the main source for catholic and protestant frameworks through the mid-seventeenth century. Jonathan Israel contends that Cartesianism “shattered” the “intellectual unity” of Europe, prompting efforts from all sides “to reconfigure everything—theology, philosophy, and science—into a new and more viable unity” (Contested

64). Fittingly, it is during this period of intellectual revolution, at the very height of the conflict between traditionalists and radicals of the late century, that Pierre Bayle's *Dictionnaire historique et critique* (1697) emerges.

The *Dictionnaire* demonstrates a concern for correcting error that is reminiscent of Vesalius and Bacon's works. Bayle explains in a letter to Jacques du Rondel that the entire plan for the dictionary consists in producing "the largest compilation I can of the faults which are met with in Dictionaries, and not to confine my self within these bounds, however large and extensive, but to make sallies upon all sorts of authors, whenever occasion offers" ("Project" 784). Foremost among the authors targeted by Bayle was Louis Moréri, compiler of *Le grand dictionnaire historique, ou le mélange curieux de l'histoire sainte et profane* in 1674.⁵ Bayle claims in the preface to his dictionary, "My principle design was to observe the faults of Moreri, and of all other Dictionaries like his" ("Preface" 2). Bayle's plan quickly came under the scrutiny of his colleagues, however, most of whom agreed that such a scheme would not be successful. Heeding their advice, Bayle expanded the scope of his dictionary to include two volumes of historical and philosophical articles, abandoning the idea of an annotated list of corrections.

From a structural standpoint, Bayle's *Dictionnaire* conforms to the original blueprint of Moreri's dictionary (and many others before it), consisting entirely of select biographies and numerous articles on locations throughout the world. Thus Bayle's claim to innovation comes less from the actual organization of his information, and more from the historical-critical approach that he adopts as a philosopher. Jonathan Israel argues that Bayle made use of the biographies in the *Dictionnaire* to "point out the pervasive presence of atheistic, deistic, and materialistic philosophies throughout the whole history of human thought, seemingly almost with the deliberate intention of coaxing readers to focus their minds on radical arguments" (*Radical* 136). In many cases the similarities drawn by Bayle between ancient philosophers and

modern (most notably, Spinoza) are exaggerations of the facts—a point demonstrated by many of his critics immediately after the publication of the *Dictionnaire*—yet, Bayle manages to bring before the ‘public’ an impressive number of ideas that had been, and were currently being suppressed in France. The aim of these histories was to provide a critique of traditional theology and its interpretations of ancient authors like Plato and Aristotle as proto-Christian sources—interpretations that Bayle considered to be flawed by “superstition” and “popular credulity” (Contested 77). In this way, Bayle’s *Dictionnaire* sets out to further the revolution in textual criticism begun by Bacon, Descartes, and Spinoza, replacing orthodox interpretations of scripture with the analysis of nature as a historical process (Contested 411). Bayle’s entries are thus as much re-interpretations of these and other foundational texts—along naturalistic lines—as they are re-definitions of the basic aims of philosophy.

The influence that Bayle has on the encyclopedic movement is not immediately clear, however. The *Dictionnaire* does not represent the full expression of Bayle’s contribution to the Enlightenment; thus one has difficulty in nailing down its actual influence on encyclopedias of the eighteenth century. Most dictionaries of the period serve the limited purpose of providing a basic level of information about a given term or concept. Bayle, on the other hand, conceives of his dictionary as “library” for “lovers of learning, [who] have not wherewithal to purchase books” (“Preface” 6); yet, the *Dictionnaire* lacks any real sense of organization. Bayle leaves the order of the contents to his readers, who are free to browse according to their fancy. The only gesture he makes at affecting an arrangement is to mimic the alphabetical scheme of earlier dictionaries.

Even such a simple mode of organization as the alphabet is not without its problems, however. Bayle acknowledges that alphabetical arrangements impose practical restrictions on the placement of certain articles in the dictionary, since some letters will have more entries than

others. He writes, “The proportion I have observed betwixt the letters of the alphabet, has been the reason of my referring some articles from one letter to another” (“Preface” 8). Bayle finds it necessary, in other words, to change the title word of certain articles—thereby designating headwords other than those originally imagined for each concept—in an effort to distribute the essays proportionally throughout the two volumes. Bayle’s confession reveals a fundamental flaw with the alphabetical arrangement. From a marketing standpoint, printers expect to sell their editions for a maximized profit. This means that each volume of the *Dictionnaire* had to be proportionally similar, thereby creating a sense of equal value for the subscribers. While this disruption of order is not a vital concern for the focused aim of the *Dictionnaire*, such issues remind us that the print process itself sometimes determines the arrangement of information.

In an indirect way, however, the lack of any real sense of order in Bayle’s *Dictionnaire* contributes to the obsession with systematic organization so easily identifiable in Enlightenment encyclopedism. To a large extent, the whole aim of Bayle’s *Dictionnaire* is to dismantle the traditional Aristotelian arrangement of knowledge (which, incidentally, serves as the model for most encyclopedias of the medieval and early modern periods) (Collison 31); and for those who come in Bayle’s wake, the natural step that follows is to attempt a new system of the world based on the historical criticism of the New Philosophy. It seems necessary then to amend the claim that Bayle introduces “a new kind of critical historical encyclopedism” (Contested 409). We can safely assert instead that the *Dictionnaire* (among other works of the seventeenth century) helps to engender a ‘need’ for encyclopedism in eighteenth-century Europe. In this sense, encyclopedism fills a niche demand during the Enlightenment, bridging the gap between the reconfigurations of philosophical development and the reclassification of knowledge that follows.

Ephraim Chambers’s *Cyclopædia: Or, an Universal Dictionary of Arts and Sciences* is an early example of the “inter-relation of philosophy, the classification of knowledge, and

encyclopaedia-making” (Collison 32). Chambers’s use of the term “universal” to describe his dictionary gives us a sign of things to come, demonstrating a tendency in enlightenment thinkers to treat the idea of “totality” as “virtually a poetic trope” (Maniquis 80). In keeping with this inclination, Chambers is critical of previous attempts to theorize a general structure for the dictionary. He complains, in the preface to the *Cyclopædia*,

Former lexicographers have scarce attempted any thing like structure in their works; nor seem to have been aware, that a dictionary was, in some measure, capable of the advantages of a continued discourse. Hence it is that we see nothing like a whole in what they have done [...] (Chambers “Preface” ii).

The publication of the *Cyclopædia* (1728) comes three decades after Bayle’s *Dictionnaire* in France, and a mere eighteen years after the first English edition (1710). By Chambers’s time, the *Dictionnaire* had become quite influential throughout Europe, inspiring numerous imitations during the first half of the eighteenth century—works like William Oldys’ *Biographia Britannica* (1747).⁶ It seems likely for this reason that much of Chambers’ criticism originates in the perceived absence of any recognizable organization in the Bayleian scheme. He proposes, in response, the invention of a structural mode that will be “as different from most of theirs, as a system is from a cento” (“Preface” ii).

Chambers’ analogy seems at first to be a mere flourish of words, but in fact, the comparison is well considered. Chambers describes the cento as “a Work [or poetry] wholly compos’d of Verses, or Passages promiscuously taken from other Authors; only dispos’d in a new Form, or Order” (*Cyclopædia* 1: 180).⁷ A System, in contrast, denotes: “[...] a certain assemblage, or Chain of Principles: Or the Whole of any Doctrine, the several Parts whereof are bound together, and follow or depend on each other” (2: 165). Thus, Chambers differentiates his structure from Bayle’s on the premise that all dictionaries in the Bayleian mold are simply patchworks held together by the thinnest of threads: namely, the alphabet. In short, because Bayle arranges his

articles wholly by the arbitrary order of the alphabet, they lack “the advantages of a continued discourse” (“Preface” ii). Systematic arrangement, on the other hand, attempts to re-establish particularized knowledge within the “natural order of science, out of which the alphabetical order had removed [it]” (“Preface” ii). As such, Chambers’ primary goal does not appear to be to provide new information (in fact, like most lexicographers, including Bayle, Chambers compiles most of his information from other writers); rather, he intends to improve the plan of the dictionary.

Chambers calls the new dictionary a *cyclopædia* because his organizational system provides a way to represent “the whole circle, or body of knowledge, with all its parts and dependences” (“Preface” ii). With this description, moreover, we are able to acknowledge Chambers’ debt to the anatomical mode. Keeping in mind the generic criteria of systematic dissection, the plan for the *Cyclopædia* seems to recognize its own structural dependence on the anatomical mode. The author announces his plan to progress from “so many parts” of a subject to “some greater whole.” Chambers writes that connections between parts will be “pointed out by a reference,” which allows him to link articles in such a way that “a communication might be opened between several parts of the work” (“Preface” ii). In this fashion, the *Cyclopædia* tries to assemble a system of cross-references similar to those found in Vesalius’ *De humani corporis fabrica* and Crooke’s *Mikrokosmografia*. To add further weight to the organizational association, Chambers cites his entry for “ANATOMY” as a representative instance of the *cyclopædic* scheme:

The article for ANATOMY is not only considered as a whole, *i. e.*, as a particular system, or branch of knowledge; and accordingly divided into its parts, *human*, and *comparative*: and human, again, subdivided into the *analysis of solids*, and *fluids*, (to be referred to in their several places in the book, where they themselves being treated of, refer to others still lower, and so on) but also as a part of MEDICINE; which, accordingly, it refers to; and which, itself, refers to another higher, &c. — By such means, a chain may be carried on, from one end of an art to the other, *i. e.* from the first or simplest complication of ideas, appropriated to the art, which we call the *elements*, or principles thereof, to the most complex, or general one, the name or term that represents the whole (“Preface” ii).

Understandably, the relationship between the part and the whole is crucial for constructing an integrated model of the human body. As mentioned in previous chapters, anatomy privileges the “part” as the basic unit of all analysis, assuming that understandings of the “whole” begin with the separation of its components. From the standpoint of the Enlightenment, however, individual parts of a system of knowledge are not prearranged in a closed, or bordered form, like the organs of the body. Philosophers (and in this case, encyclopedists) begin with the simplest bits of information, and proceed from there to find connections, without the aid of any recognizable epistemological boundaries.

In Lockean fashion, Chambers acknowledges the primary placement of *ideas* as the most basic component of knowledge, arguing:

as our ideas are all individuals; and as every thing that exists is one, it may seem more natural to consider knowledge in its parts, i.e. as divided into separate articles, denoted by so many different terms [...] (“Preface” ii).

Thus the *Cyclopædia* portrays knowledge structurally, beginning with the simplest ideas (those originating in passive sense and reflection), and building toward higher degrees of complexity (*mode, substance, and relation*).⁸ Chambers explains:

Though the mind only sees and perceives individuals, which alone are the proper objects thereof; yet it has a power of combining and complicating these together, for its own conveniency: and hence its progress from particulars, to generals; from simple, to complex. — Hence we come to have words of all orders, and degrees; from the simplicity of an atom, to the complexness of the universe (“Preface” xiii-xiv).

In this way, Chambers echoes the basic argument of Locke’s *Essay*. For the lexicographer, however, simple ideas have little or no value in themselves. Words are, by their nature, more complex than ideas. Working from this hypothesis, Chambers positions the “term” as the most basic unified element of the *cyclopædic* structure. He characterizes the term as “a system of ideas, relating to some point,” or as “a word which comprehends several ideas under a certain relation to each other, whereby they represent some complex piece of knowledge to the mind”

(“Preface” xiv). Thus, the job of the lexicographer is to *define* terms by undoing “what was done in forming the term;” or, in other words, by dividing the term into its constituent simple ideas (“Preface” xv). In this way, Chambers views the term as a master-analogy for the entire encyclopedic project—a microcosm of the universal system—demonstrating the “chain” of unity that extends even to the fundamental components of language(s).

Chambers’ description of the division of knowledge evokes the graphic quality of the *Cyclopædia*’s organizational scheme. He is not content simply to describe the plan of his arrangement. Rather, Chambers employs a graphical representation—an ‘exploded view’ of the *cyclopaedic* system—to reveal the progressive dissection of ‘united’ knowledge. [FIGURE 5.1] At first sight, of course, Chambers’ diagram resembles traditional Porphyric representations of the ‘tree of knowledge,’ a fact mentioned in studies by Richard Yeo and Charles Withers.⁹ The stated purpose of Chambers’ division of knowledge denotes a significant departure from

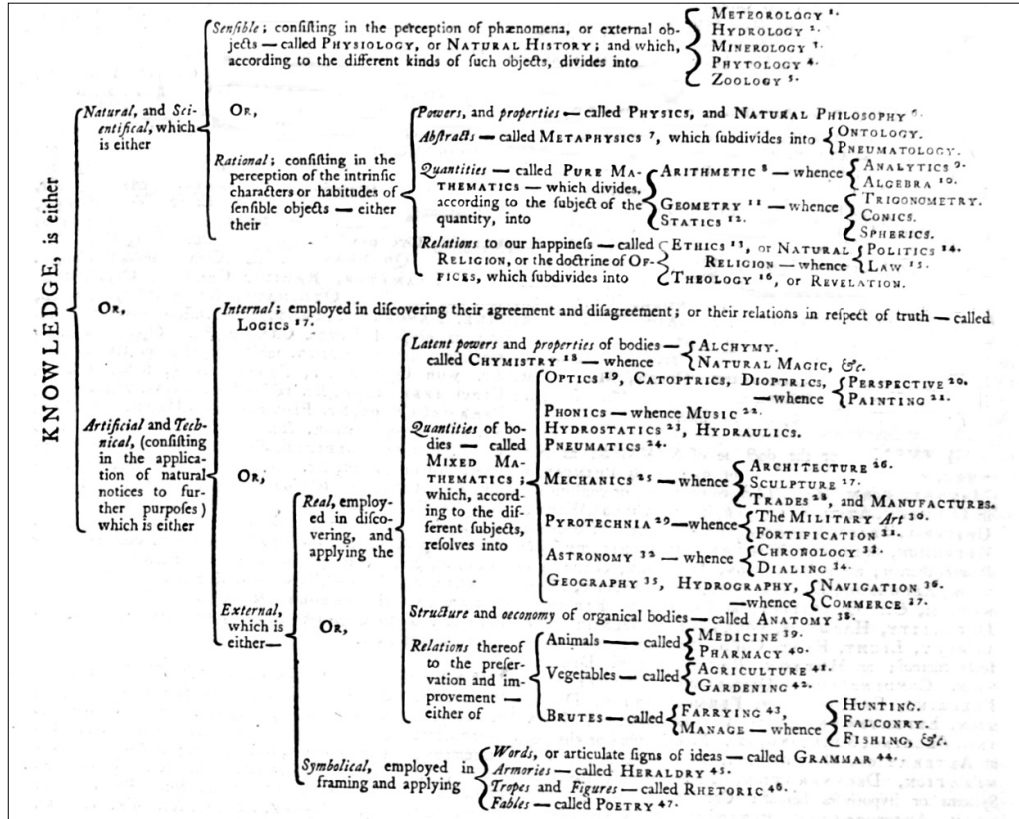


FIGURE 5.1. The ‘Division of Knowledge’ from Chambers’s “Preface” to the *Cyclopædia* (1738 ed.). Courtesy of the James Smith Noel Collection.

the metaphysical foundations of Porphyry’s tree, the form of which Collison correctly links to Aristotle’s “basic theory of classification” (Collison 31). Chambers himself links the Porphyrian Tree (*Arbor Porphyriana*) to medieval scholasticism:

ARBOR *Porphyriana*, among the Schoolmen, is a Scale of beings; or a Figure, consisting of three Rows or Columns of Words; the middlemost whereof contains the Series of Genera and Species; and bears some Analogy to the Trunk; and the Extremes, containing the Differences, to the Branches of a Tree. [...] Such is

SUBSTANCE
Thinking Extended
BODY
Inanimate Animate
ANIMAL
Irrational Rational
MAN
This That
PLATO (Cyclopædia 128).

Graphic interpretations of the Porphyrian Tree, including the *Arbor scientiæ* of Ramon Llull, can be found in numerous European texts throughout the medieval period and Renaissance. In each case, the intent of the author is to present an arrangement of the components of knowledge by their ontological relation to the Divine. [FIGURE 5.2]

Lovejoy famously describes this method of classification as the “Great Chain of Being,” which he characterizes as a “unilinear” hierarchy of metaphysical and physical continuity (Lovejoy 59). With Chambers, however, we encounter something different. Following in the wake of Bacon’s rearrangement of the sciences and Locke’s epistemological revolution, Chambers’ division of knowledge is properly empirical: privileging “*nature* [...] as she appears to our senses,” and reducing metaphysics to the level of mental abstraction (“Preface” iii). We detect greater difference, however, in the presuppositional ground of each modality. As I have argued in previous chapters, scholasticism aims at representing the synchronistic whole (*summa*) of the universe. Porphyry’s Tree does not divide knowledge, so much as it endeavors

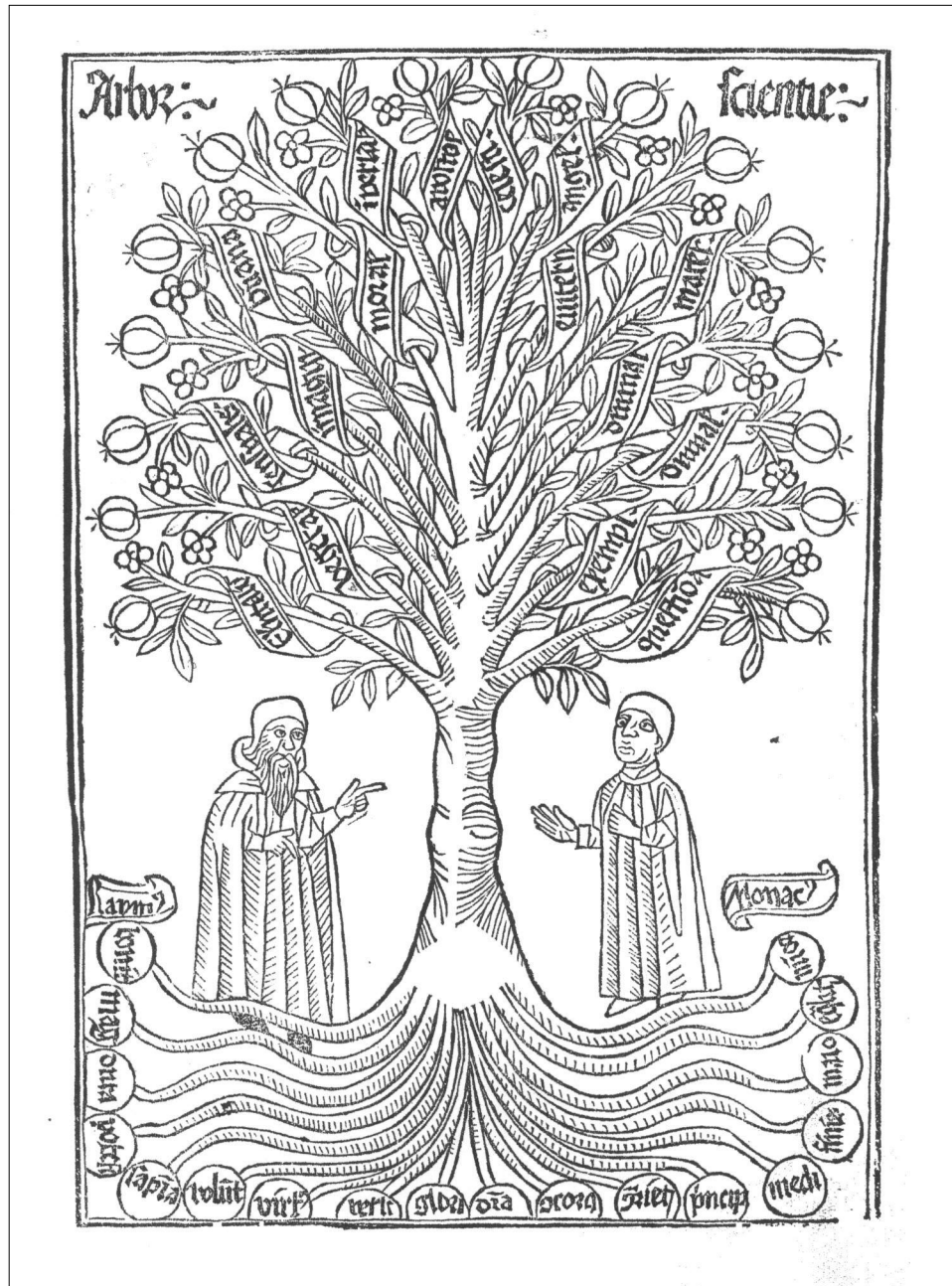


FIGURE 5.2. “Tree of the Sciences” from the 1505 edition of *Arbor scientiae* (Barcelona: Pere Posa).

to categorize the abstracted ‘branches’ of a united structure.¹⁰ Division is the epistemological tool of the anatomist, whose primary mode of analysis consists in sectioning the individual parts of a body/subject. Dissection creates the proper conditions for discrete examinations and demonstrations of the function(s) of a part, allowing the anatomist opportunities to identify systematic associations by induction. Chambers’ division of knowledge reflects the influence of

the anatomical modality, insofar as the *Cyclopædia* attempts to distribute the *body* of knowledge across a wide range of particularized articles. Doing so affords the reader an occasion to dwell on the each part of Chambers' system in isolation, before considering its relation to the whole.

Like Bayle, Chambers exaggerates the divisive nature of the *Cyclopædia* by employing an alphabetical, instead of a "systematic" arrangement. Systematic, in this case, refers to the organization of knowledge into sections, by related topic (Collison 3). Alphabetical schemes dispense with the narratological qualities of a systematic arrangement—which "partly assumes that the encyclopaedia will be read as a whole"—in favor of being able to "make quick reference to a specific subject" (3). As a result, an encyclopedia can separate two related articles on Anatomy (to use Chambers' example) across multiple volumes, thus suppressing any sense of their logical unity. Chambers considers the difficulties created by alphabetical distribution so severe that he feels compelled to include a graphical representation of the "division of knowledge," as a kind of narratological map. The purpose of the map, he claims, is to assist in gathering "the scattered articles in the book, and in connecting them together" ("Preface" iii). In theory then, Chambers' diagram serves the paradoxical purpose of representing unified knowledge in spite of its complete division. Such organizational expectations fall well outside the range of Porphyry's 'Tree of Knowledge.' We might even argue that the Porphyrian Tree is as far functionally from Chamber's representation of the "view of knowledge" as the encyclopaedia is from the scholastic summa.

Walter J. Ong traces the popular use of "spatial models" like Chambers's synopses back to the dialectics of Peter Ramus.¹¹ He writes:

Ramus had insisted that analysis opened ideas like boxes [...]. In this same age the notion of "content" as applied to books is extended, so that statements, the words of which statements consist, and concepts or ideas themselves are habitually considered as "containing" truth. An epistemology based on the notion of truth as "content" begins to

appear. Out of the twin notions of content and analysis is bred the vast idea-, system-, and method literature of the seventeenth and eighteenth centuries (Ramus 315).

Ong identifies both anatomical and encyclopedic modes as an extension of content analysis in system literature of the period. Each, according to Ong, proceeds from the conviction that an epistemological “parallelism [exists] between the physical and the intellectual worlds” (Ramus 318). In the context of print culture, synopses and diagrams (like those found in seventeenth-century editions of Ramus’ *Dialectica* and Chambers’ *Cyclopædia*) function like visual and “spatial reference[s]” (Ramus 316), which chart the “processes of thought” (Ramus 314) as the mind performs analysis on a body of knowledge. [FIGURE 5.3] Truth, as “content,” is the material of intellectual dissection (Ramus 316). Diagrams merely assume the role of *ostensor* in the anatomical theater, demonstrating each cut of the anatomist in sequence.

Chamber’s division of knowledge thus operates in a manner similar to the Ramist diagrams and synopses of Robert Burton’s *The Anatomy of Melancholy*. As spatial references, each of these diagrams performs a narratological, rather than an organizational function. Chambers argues that the organization of his text takes place over the “course of the work” (“Preface” iii), though the use of divisions, notes, digressions, and arbitrary alphabetical arrangements. As a result, he confesses that the text has “the face of a wilderness” (“Preface” ii), both because of its immensity and the irregularity of its schemes. As a possible solution, Chambers provides synopses (like those found in Burton’s *Anatomy*) as a visual map of the textual landscape. The diagrams are not meant to supply the logic of the work; rather, they display the “spatial organization” (“System, Space, and Intellect” 74) already evident in the topology of the text, allowing the reader to “find his way” safely through the wilderness toward understanding (“Preface” ii).

The metaphor of the wilderness played an important role in the way that enlightenment

HActenus de argumentis simplicibus strictim differimus: quæ idcirco sic appellantur, quod absolute absque ulla omnino comparatione considerentur.

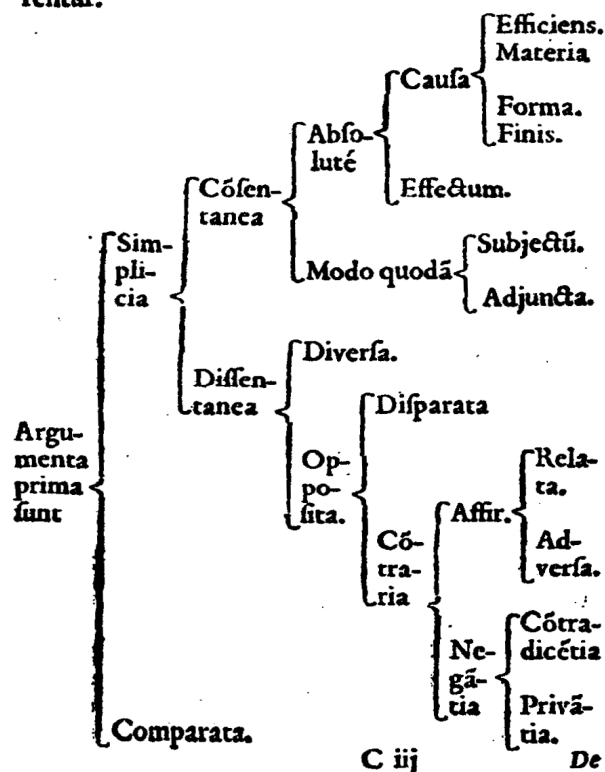


FIGURE 5.3. An example of spatial reference from Ramus’s *Dialecticæ* (1584).

thinkers envisage the accumulation of knowledge. Recent scholarship suggests important parallels between seventeenth-century theories about the logical organization of information and the encyclopedic “rationale” of the eighteenth century (Yeo 88)—particularly in the work of Gottfried Wilhelm Leibniz. In a recent biography, Maria Rosa Antognazza argues that much of Leibniz’s thought on a universal archive benefits from the “semi-Ramist” pedagogical and philosophical tradition” that “developed [...] in Germany during the latter sixteenth and early seventeenth century” (Antognazza 39). She suggests that Ramist logic

provided a powerful tool for the rigorous ordering of thoughts, which reflect in turn the division of things themselves. In other words, Leibniz saw logic as a mirror of reality which allowed the human mind to grasp the order of things (43).

As a result, Leibniz's mind naturally gravitated toward the encyclopedic efforts of Alsted, Comenius, and Bacon, for whom the use of logic was central to ordering the historical accumulation of knowledge. Building on these examples, Leibniz envisioned a new encyclopedia, which was to be a "system of all [...] true propositions and useful things which have hitherto been thought" (qtd. in Antognazza 94-95).

Leibniz's plan to produce a universal "encyclopedia of the sciences" (Antognazza 79) assumed a variety of forms. One of his more curious undertakings was the plan for a Universal Library. Between the years 1676 and 1716—the year of his death—Leibniz was employed as the court librarian to the Bibliotheca Rudolphea at Hanover, under Dukes Johann Friedrich and Ernst August, and later (1690-1716) to the Bibliotheca Augusta at Wolfenbüttel, under Dukes Rudolf August and Anton Ulrich (Newman 17-24).¹² Leibniz's responsibilities, which he undertook with his accustomed intellectual fervor, included the expansion (through acquisition) and organization of both libraries. For Leibniz, the desire to collect "all branches of knowledge and information" (Leibniz 41)—both ancient and modern—within the walls of a "universal library" (Radical 124), ran together with a growing need to manage an ever-increasing amount of books, manuscripts, incunabulæ, and journals. Following his tour of Paris, between 1672 and 1676, Leibniz became increasingly aware of his comparative isolation in Hanover (Antognazza 196). A general lack of access to the latest philosophic and scientific treatises, which were cropping up everywhere in France, Holland and Britain, fueled growing apprehensions about the seemingly interminable expansion of the 'field' of knowledge and a corresponding increase in published materials. Leibniz's plan for a Universal Library offered the means by which the wilderness of knowledge could be brought to order.

The task, Leibniz argued, required the introduction of a systematic index. He recommended a multilayered cross-referencing scheme composed of subject indexes, which would augment existing alphabetical catalogues of books and authors, like those he inherited at the Bibliotheca Augusta. In a letter to Duke August, Leibniz extols the value of his new indexing method:

[...] the best and most valuable aid – namely subject indexes – still remains to be achieved. By their means one can determine the information available and its location, not only in every field of knowledge, but also under every general and special subject-heading, and the authors who treat it in detail. This bears strongly on the chief purpose and use of such an excellent library (Leibniz 44).

Leibniz’s plan for a universal library thus begins with a principle separation of each “class” of book, manuscript, etc., into categories and sub-categories (Newman 29).¹³ This first level of indexing permits readers to make quick reference to a particular grouping of texts by topic and location. Leibniz understood, nonetheless, that simply ordering books by subject would create a new dilemma—what L. M. Newman calls “distributed relatives” (30), or the issue of joint allocations in intellectual as well as physical space. Leibniz explains:

One and the same truth may have many places according to the different relations it can have. Those who arrange a library very often do not know where to place certain books, being in suspense between two or three places equally suitable (qtd. in Newman 30).

His solution to the problem of joint allocation hinged on the design of a secondary index, which cross-referenced the relations that a book might have to a variety of subjects throughout a given system of classification. The implication—obvious to contemporary readers—is that a library must do more than simply accumulate and catalogue books by author. Readers at the Bibliotheca Rudolphea and Augusta would have the ability to locate information by author, subject and relation. Thus the nucleus, or mind of the universal library consists in the combinatory logic of its system of indexes. The library becomes an extension of human thought, artificially retained and, therefore, (re)collectable (Antognazza 111-112). Leibniz’s arrangement, when equipped by an aggressive acquisition plan, makes the universal library more than a mere “warehouse,”

or wilderness of information (Leibniz 43). His plan supplies a method for storing information in a way that still permits meaningful access to content. In short his archive strives to be both comprehensive and (to use a modern term) ‘searchable.’

Those familiar with the prefaces of eighteenth-century encyclopedias will recognize a familiar theme in Leibniz’s plan. In fact, as should now be evident, the task of the encyclopedist is not fundamentally different from that of the librarian: both must supply a method for compiling massive amounts of information in a still useful manner. Leibniz’s ideas about organization and the universal library would have had a substantial influence on British and French encyclopedists, including Ephraim Chambers. As a member of “the two great national academies,” the Royal Society and the Royal Academy of Sciences (Newman 16), Leibniz formed a number of important relationships in England and France. Newman writes, moreover, that Leibniz shared information about his plans for a systematic index with scholars and librarians throughout Europe, effectively positioning his ideas before “a phenomenal number of individuals” (33). Leibniz’s proposal would have had an appeal across a wide spectrum of disciplines: everywhere, in fact, that the growth of knowledge threatened to expand beyond the capacities of science and art to encapsulate.

Academic periodicals such as France’s *Journal des Savants* and England’s *Philosophical Transactions*, reveal the widespread character of Leibniz’s anxiety. Jonathan Israel reports that by 1718 as many as fifty journals “had come into existence in German, Italian, Dutch, and English, as well as French and Latin” (Radical 144), each attempting to chronicle the expansion of “new ideas and knowledge” for an eager audience (Radical 142). The problems of intellectual ‘magnitude’ appear to have been universal; and the attempt to keep pace with an ever-increasing number of contributions resulted in an unending process of scholarly abstraction, summarization and review (14). Europe had become lost in the sheer expanse of its own

intellectual production, and recognition of the need to compile and organize information in a more efficient manner naturally followed. Leibniz's plan for the universal library thus contributes to a larger conversation taking place during the early Enlightenment. It is possible to view Leibniz's universal library as a kind of compass for Chambers' wilderness. A compass is not the equivalent of a map, however.

Compilers of the various "Universal Encyclopedias" were quick to realize that by applying the place-logic of systematic organization to textual arrangements, they did not free their readers from all potential confusion. Like Chambers, they began imitating the diagrams of logicians like Ramus, labeling these structures 'maps' or 'divisions' of knowledge; however, the next surge of encyclopedism would take the material spatiality of knowledge maps a step further, attempting to chart the universal 'enchainment' of information in strictly physical terms. In *The Preliminary Discourse to the Encyclopedia of Diderot*, d'Alembert describes the process of creating a general system of the sciences and arts as "a sort of labyrinth, [or] a tortuous road which the intellect enters without quite knowing what direction to take" (d'Alembert 46). Like Chambers, d'Alembert conceives of knowledge as a mappable region that, from ground perspective, presents the mind with endless turns and obstructions. The only solution available to the encyclopedist is to assume, in d'Alembert's words, "a vantage point [...] high above this vast labyrinth, whence he can perceive the principle sciences and the arts simultaneously" (47). From this elevated perspective the philosopher/cartographer sees the *principle* branches of knowledge like roads cut into the surface of the countryside. With the insight gained from such a height, the philosopher can project the sources, connections, and extensions of each branch onto "a kind of world map" (47). In short, it is the special domain of the enlightened philosopher to make the universal system of knowledge recognizable.

Charles Withers describes the importance of "geographical metaphors" in establishing a new

forma mentis, or a way of “transform[ing] the topography of everything known” (Withers 284).

We see in Withers’ argument a reiteration of Ong’s thesis that knowledge (as the Enlightenment recognized it) possesses a kind of materiality, which allows it to be divided and subdivided almost without end. D’Alembert expands on this assumption in a way that recalls Chambers’ design:

The road is often cut by a thousand obstacles, which are known in each country only to the inhabitants or to travelers, and which cannot be represented except in individual, highly detailed maps. These individual maps will be the different articles of the *Encyclopedia* and the Tree or Systematic Chart will be its world map (47-48).

Like Chambers, d’Alembert sees the articles of the encyclopedia as the main instrument of division. Each article is a single road on the world map, possessing its own ‘geographic’ autonomy. Unlike Chambers, however, who compiled the articles of the *Cyclopædia* by himself, d’Alembert insists that only those who ‘inhabit’ an area know the particulars of each road/subject. A major element of the *Encyclopédie*’s structure centers then on the use of contributors to supply content, rather than demonstrating the knowledge and abilities of one master-compiler. As a result, the authors of the *Encyclopédie* number in the hundreds, each bringing a unique set of skills and information to the table. Thus the division of knowledge takes on a new importance in the mind of d’Alembert, who does not merely gesture toward the idea of unity-in-multiplicity, but instead makes a very subtle statement about the actual dispersion and seeming uncertainty of information.

D’Alembert and Diderot appear to understand fully the implications of such a divided structure. Their “Systematic Chart,” or “map” of knowledge comes with a significant caveat:

But as, in the case of the general maps of the globe we inhabit, objects will be near or far and will have different appearances according to the vantage point at which the eye is placed by the geographer constructing the map, likewise the form of the encyclopedic tree will depend on the vantage point one assumes in viewing the universe of letters. Thus one can create as many different systems of human knowledge as there are world maps having different projections, and each one of these systems might even have some

particular advantage possessed by none of the others. There are hardly any scholars who do not readily assume that their own science is at the center of all the rest, somewhat in the way that the first men placed themselves at the center of the world, persuaded that the universe was made for them (d'Alembert 48).

The rather serious implications of d'Alembert's comments cast a shadow of doubt over the entire organizational project of the *Preliminary Discourse*. Effectively, d'Alembert dispenses with Chambers's notion of a 'static' chain, in favor a more fluid arrangement. The organizational map of the *Encyclopédie* reflects the perspective of a single set of eyes—while acknowledging the existence of a multitude of vantage points. Viewed from different angles then, the universe of letters has the potential to suggest seemingly infinite numbers of systems—or more precisely, projections of systems. Put in another way, the only limit imposed on system-construction appears to be the number of perspectives available to the philosopher/cartographer. In a more obvious way than Chambers' division of knowledge then, d'Alembert and Diderot's world map reveals the structure of the *Encyclopédie* as simply one manifestation of order among many.

It may be useful here to recall Bayle's description of the essays in his *Dictionnaire* as distinct books in a library. We likewise may consider the individual articles of the *Encyclopédie* as books in a universal library,¹⁴ with d'Alembert's "*Système figuré des connoissances humaines*" [FIGURE 5.4] a kind of systematic index of subjects. Every library participates in a bilateral process of acquisition and arrangement. Acquisitions are determined, in general, by the needs of a library. In theory, the universal library draws on a basic division of knowledge to guide the procedures for obtaining books; but such initial governance in no way constitutes an organizing structure. Once a text crosses the threshold of a library, it joins an immense wilderness of information. If one begins with the assumption that the book in question bears a relation to the larger archive, evidence of that association disappears behind a shroud of seemingly limitless material. It becomes the responsibility of the librarian, at this point, to supply a measure of artifice by

* SYSTÈME FIGURÉ DES CONNOISSANCES HUMAINES.

ENTENDEMENT.

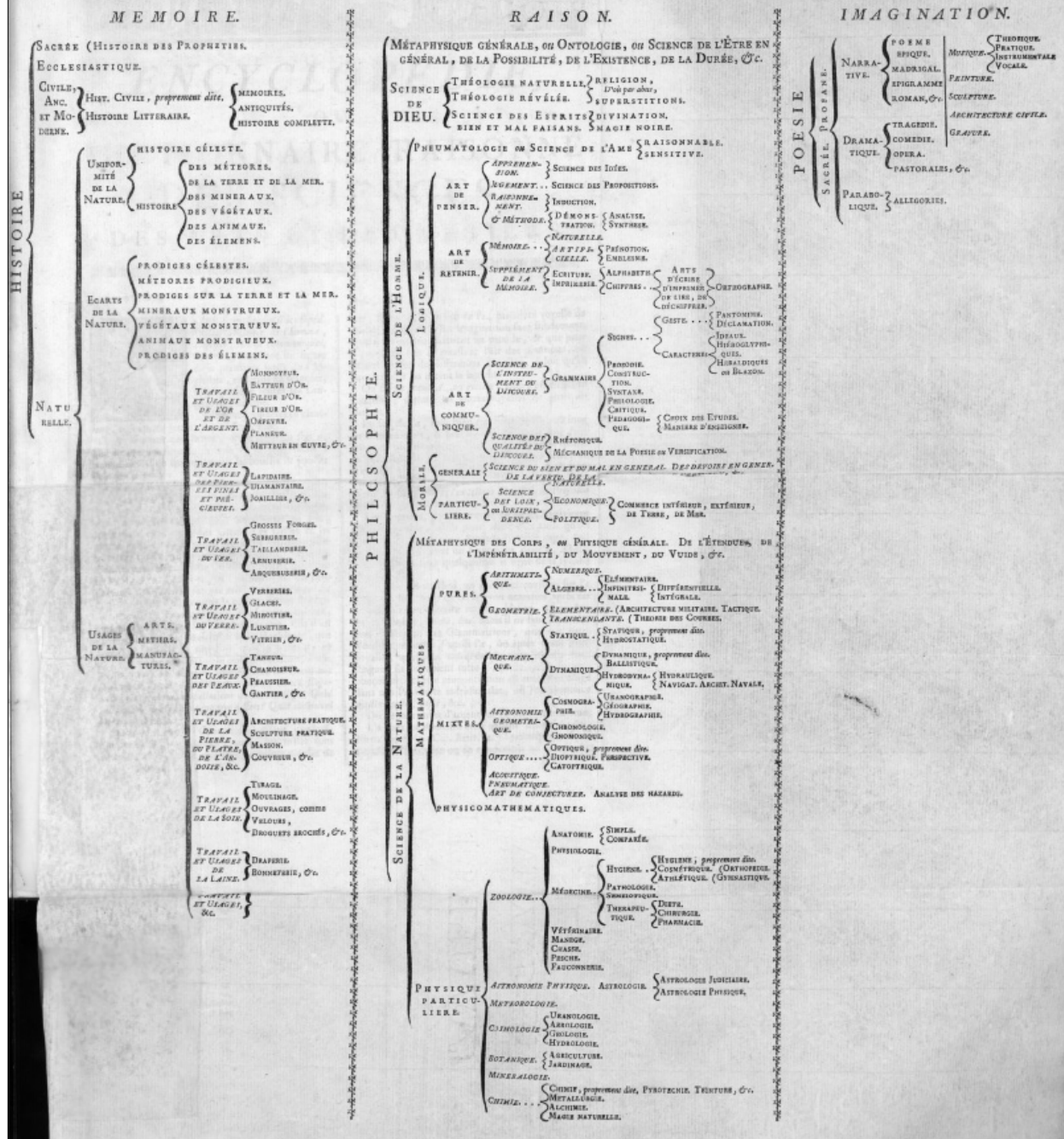


FIGURE 5.4. The “Système figuré des connoissances humaines” from the “Preliminary Discourse.” Courtesy of Special Collections, LSU Libraries, Louisiana State University. <http://lib.lsu.edu/special>

shaping the forest to resemble the tree of knowledge. Pruning of this sort can be accomplished only by reducing (or dissecting) whole texts to reveal the multitude of constituent subjects contained in their pages. As a result, systematic organization begins with an analysis of parts and proceeds to map possible connections. This is the case, not simply because the universal library assumes that connections exist between all the branches of knowledge, but because foundational associations, about which we have the most certainty, occur on the level of the individual subject.

In a more radical way, d'Alembert argues that all philosophic investigation begins with analysis of the individual 'parts' of knowledge, all of which we receive as phenomena from the senses. In the *Preliminary Discourse*, he draws an important distinction between what he calls the true "systematic spirit," and the "spirit of system" (22-23). The phrase "systematic spirit" signifies for d'Alembert the mathematical "art of reducing [...] a large number of phenomena to a single one that can be regarded as their principle" (22). Ultimately, all human understanding can be reduced to three categories: Memory, reason, and imagination. Instead of beginning his analysis of knowledge with these main principles (*a priori*, as a metaphysician might), d'Alembert argues, like Bacon, that a philosopher must work in reverse from individual phenomena, inducing evidence of their "enchainment," or the "liaison that they have with one another," from experience (23).

As many historians have noted, the systematic approach of the *Encyclopédie* represents a significant rupture between Enlightenment and traditional philosophy. This conflict is largely anticipated by Diderot and d'Alembert, and, to an extent, encouraged by the rhetoric of the *Discourse* and the various articles. d'Alembert, of course, describes the traditionalist attitude with a second characterization, the "spirit of system." From the viewpoint of post-Newtonian physical science, the "spirit of system" refers to a problematic tendency in traditional science and philosophy toward metaphysics, which sustains the possibility of a supernatural cause for natural

phenomena. D'Alembert comments sardonically, and at length:

The spirit of systems is in physics what metaphysics is in geometry. If it may sometimes be required in order to start us on the way, it is almost never capable by itself of leading us to truth. It can glimpse the causes of phenomena when enlightened by the observation of Nature; but it is for calculations to assure, so to speak, the existence of these causes by determining exactly the effects they can produce and by comparing these effects with those revealed to us by experience. Any hypothesis without such a support rarely acquires that degree of certitude which ought always to be sought in those frivolous conjectures honored by the name of "systems." If all he could have were conjectures of that kind, the principle merit of the physicist would be, properly speaking, to have the spirit of system but never to create one (95).

We hear in d'Alembert's remarks the influence of Bacon. While d'Alembert admits that metaphysics has a place in scientific analysis, in doing so he echoes Bacon's claim that Nature is the only certain guide to discoverable truth. Metaphysics, Diderot writes in the *Encyclopédie*, "c'est la science des raisons des choses,"¹⁵ "it is the science of the reasons for things." When employed in the correct manner, metaphysics allows the examiner to speculate about the causes of phenomena; yet, "Quand on borne l'objet de la métaphysique à des considerations vuides & abstraites sur le tems, l'espace, la matiere, l'esprit, c'est une science méprisabile," "metaphysics is a despicable science when its object is limited to abstract and empty considerations about time, space, matter, and the spirit." According to Diderot and d'Alembert, metaphysics, divorced from the evidence of experience, cannot hope to construct a theory of time, space, matter or spirit. Abstract speculation—even about the agency of God—is useless if it cannot find support in the observation of natural phenomena. All universal schemes fashioned from the "frivolous conjectures" of metaphysics fail to satisfy the new criteria of encyclopedic systematization. Such schemes have the spirit of a system, but fall short of the scientific certainty demanded of them.

In a fundamental way then, the requirements of certainty shape the content and structure of the *Encyclopédie*. Diderot and d'Alembert believed that they were enjoying the benefits of a 'new philosophy,' inaugurated by the likes of Descartes, Bacon, Leibniz, Newton, and continued

during the eighteenth century. D'Alembert remarks: "Think of the progress that has been made since their time in the sciences and the arts! Think of the many truths that are unveiled today which were not dreamed of then" (108). Like Chambers, d'Alembert and Diderot insist that advancements made in the sciences and arts be documented for posterity; and yet, they share Leibniz's anxieties about the certainty of knowledge and its proper arrangement. The task before them appears difficult at best, untenable at worst. D'Alembert complains:

The most natural arrangement would be the one in which objects followed one another by imperceptible shadings which serve simultaneously to separate them and to unite them. But the small number of beings known to us does not permit us to indicate these shadings. The universe is but a vast ocean, on the surface of which we perceive a few islands of various sizes, whose connection with the continent is hidden from us (49).

One senses in d'Alembert's comments that, ultimately, the job of the encyclopedist extends far beyond that of previous lexicographers. Though the original plan for the *Encyclopédie* called only for a French translation of Chambers' *Cyclopaedia*, Diderot and d'Alembert are enamored with the notion of producing a work that approximates (as much as possible) a complete system of knowledge. Both men admire the achievements of Chambers' encyclopedic arrangement, but lament the scale of his "omissions," and thus the imperfections of his system. Taken together, Chambers's mistakes break the overall "enchainment" of the work (111). Thus the *Encyclopédie* represents an effort to augment and correct Chambers, just as Bayle's *Dictionnaire* attempted to remedy the 'mistakes' of Moreri. Try as they may to produce an authoritative map of knowledge, however, Chambers's wilderness proved resistant to their systematic efforts. Because the content of the *Encyclopédie* was distributed across so many different authorities, the articles never achieved the sense of unity that Diderot and d'Alembert imagined. Certainty eluded them, as it had eluded everyone before them.

The importance of the *Encyclopédie* lay mostly in the attempt to create a universal archive of knowledge. Not everyone agreed, however, that such an enterprise was possible. Between

the years 1768 and 1771, a group of Scots—Andrew Bell, Colin Macfarquhar, and William Smellie—published the first edition of the *Encyclopædia Britannica*, intended as a ‘British’ response to the *Encyclopédie* (Yeo 175-76). In the preface to the *Britannica*, the editors bravely dismiss the plans of Chambers and d’Alembert as inferior to their improved method of organization, commenting:

Whoever has had occasion to consult Chambers, Owen, &c. or even the voluminous French *Encyclopédie*, will have discovered the folly of attempting to communicate science under the various technical terms arranged in an alphabetical order. Such an attempt is repugnant to the very idea of science, which is a connected series of conclusions deduced from self-evident or previously discovered principles. It is well if a man be capable of comprehending the principles and relations of the different parts of science, when laid before him in one uninterrupted chain. But where is the man who can learn the principles of any science from a Dictionary compiled upon the plan hitherto adopted? (“Preface” v)

Beyond the obvious monetary value of controversy-driven self-advertisement, the editors do in fact attempt something new. Instead of “dismembering the Sciences” by dividing them into technical terms, like Chambers and Diderot, the editors of the *Britannica* claim to have “digested the principles of every science in the form of systems or distinct treatises” (“Preface” v). Interestingly, comparisons between systematic arrangement and the work of anatomy (arguments employed by both Chambers and d’Alembert) become emblems of dismemberment in the *Britannica*. The notion of system itself takes on new meaning, as the editors refer to their treatises as discrete wholes, and not as parts of a larger enchainment of ideas. The ‘division of knowledge’ disappears completely from their encyclopedia, in fact, leaving the reader to marvel at the severe break between Chambers’ approach and that of the new, improved plan of the Scots.

To an extent, the argument of the *Britannica* signals a growing measure of cynicism toward the supposed unity of knowledge. D’Alembert himself warns that the “encyclopedic arrangement does not suppose that all the sciences stem from one another.” Instead, the branches grow from the single “trunk” of the “human intellect,” and therefore “have no immediate connection

among themselves” (d’Alembert 58). The editors of the *Britannica* take this awareness a few steps further, abandoning the idea of a mappable division of knowledge, in favor of smaller, less abstracted systems, or treatises. As Richard Yeo observes, however, “early reaction to these [...] treatises was not uniformly positive” (182). Smellie, who pieced together many of the essays, fell victim to the same problem that plagued his predecessors: namely, in the words of one reviewer, the *Britannica* resembled a “garden [...] all over run with weeds” (qtd. in Yeo 182). Seemingly there was no answer to the problem of wilderness in the manicured land of knowledge.

Perhaps it is fair to conclude that encyclopedism of the late seventeenth and early eighteenth centuries flowed from the idealistic attitudes of the period. Newton’s ‘system of the world’ seemingly made the universe into a vast archive of knowable content. Libraries and encyclopedias begin as a specific attempt to compile information about that universe and to organize it in a condensed and searchable medium. Many historians have lauded d’Alembert and Diderot’s *Encyclopédie* as the greatest expression of Enlightenment thinking and organization. Thinking more critically, however, one might argue, that the *Encyclopédie* exists also as one of the period’s greatest failures. Specifically, the plan for the *Encyclopédie* creates expectations that the editors can never fulfill—a fact highlighted by the compilers of the *Encyclopedia Britannica*. Enlightenment theorists wrestled with with the seeming wilderness of knowledge. They proposed systematic (one might argue, artificial) schemes for charting that expanse, turning an eye to the successes of anatomy in mapping the ‘microcosm’ of man. In the end, however, the sheer wildness of the field of knowledge proved too forbidding for the human intellect to abstract and arrange, leading many to abandon efforts to produce a universal archive—or to relinquish the idea of a *uni*-verse altogether.

Endnotes:

¹ See Robert Collison’s description of the various innovations made during the medieval period

(Chapter II).

² Vesalius' desire to correct the errors of the ancient world extended to Aristotle's description of the human heart as well. Bacon would have seen dissection as one of the many kinds of experiment that contribute to the purgation of false information that had been accepted on the authority of ancient sources.

³ Though not taught by Vesalius himself, Harvey was a student of Fabrizio d'Acquapendente (a former student of Vesalius) at the University of Padua.

⁴ *Organon* is the Greek word for "organ." The entry in the *OED* reads: "1. A bodily organ, esp. as an instrument of the soul or mind. *Obs.* [...] 2. An instrument of thought or knowledge; a means of reasoning, discovery, etc.; esp. a system of rules or principles of demonstration or investigation. Freq. used as the collective title for the logical treatises of Aristotle." (c.v., *OED*, "organon.")

⁵ Collison writes, "the word 'sainte' was changed to 'sacrée' in the title" in the second edition (88).

⁶ Since the work was published anonymously, scholars have not come to a consensus about the editorship of the *Biographia Britannica*. William Oldys is considered by many to be the most likely candidate, having contributed a substantial number of articles to the work.

⁷ The 1738 edition of the *Cyclopædia* adds the following phrase to the end of the quoted passage: "[...] so as to compose a new work, and a new meaning." The *OED* defines cento as "A composition formed by joining scraps from other authors." (c.v., *OED*, "cento")

⁸ See Locke's *Essay Concerning Human Understanding* (Book II, Chapters I-XII).

⁹ See Richard Yeo's *Encyclopaedic Visions: Scientific Dictionaries and Enlightenment Culture* (Cambridge University Press, 2001) and Charles W. J. Withers' article, "Encyclopaedism, Modernism and the Classification of Geographical Knowledge," in *Transactions of the Institute of British Geographers, New Series* 21:1 (1996), 275-298.

¹⁰ Consider here the idea of the Trinity: One God, Father, Son, and Holy Spirit.

¹¹ I owe knowledge of this connection to the kind suggestions of Irwin Primer.

¹² According to Newman, Leibniz took over the duties of court librarian for the *Bibliotheca Rudolphea* (under the patronage of John Frederick, Duke of Brunswick-Lüneburg) in 1676, and the *Bibliotheca Augusta* (Wolfenbüttel) in 1690. He continued in this capacity until his death in 1716.

¹³ Newman writes that Leibniz followed the traditional arrangement of books according to the "four faculties: Philosophy, Jurisprudence, Medicine and Theology" (29).

¹⁴ d'Alembert writes in the 1751 edition: "In a word, each of our colleagues has made a dictionary of the part with which he is charged, and we have joined all these dictionaries together" (113).

¹⁵ *Encyclopédie*. s.v. "Métaphysique."

CONCLUSION

In these chapters I have tried to historicize the development of an early modern literary genre, the anatomy. Throughout this account, anatomy assumes a wide variety of forms; however, I have tried to argue that this apparent diversity often masks an underlying homology of intellectual structures. The job of classifying an anatomical genre relies more on the critical identification of these structures—as the nucleus of such literary productions—than on the willingness of an author to label his work an anatomy. As with Howard Weinbrot’s ‘Menippean satire,’ it seems that we are dealing with a “Genre That Ate the World” (Weinbrot 1), making the process of literary definition more precarious.

During the seventeenth and eighteenth centuries, England’s printers churned out hundreds of anatomies on widely different topics. Some of the more famous examples include John Lyly’s *Euphues. The Anatomy of Wyt* (1578), Robert Burton’s *The Anatomy of Melancholy* (1621), and George Savile’s *The Anatomy of an Equivalent* (1688). Added to these, however, are countless instances of anatomy on both important and mundane topics, including: Samoth Yarb’s *The Anatomy of Et cætera* (1641), Richard Ward’s *The Anatomy of Warre* (1642), John Taylor’s *The Anatomy of the Separatists, Alias, Brownists, the Factious Brethren in These Times* (1642), Sir John Denham’s *The Anatomy of Play* (1651), John Davies and David Browne’s *The Writing School-Master: Or, the Anatomy of Fair Writing* (1667), *The Anatomy of Popery: Or, a Catalogue of Popish Errours* (1673), *The Anatomy of Transubstantiation* (1680), *The Anatomy of an Arbitrary Prince; or, King James the II* (1689), Daniel DeFoe’s *The Anatomy of Exchange-Alley: Or, a System of Stock-Jobbing* (1719), *The Anatomy of the Scots Tory: With a Word to the Author of the Anatomy of the Whig* (1719), and Sir William Dawes’ poem *An Anatomy of Atheism* (1731), among many others.

To say that each of these examples has a common organizational thread that unites them

would be misleading. Among many protestant writers of the Restoration, for example, it simply became modish to apply the anatomical epithet to attacks against the Roman Catholic Church, without regard for a common structure. Most of these treatises amount to little more than polemical diatribes against the religion of Charles II, and against “*Pagan and Infidel Rome*” (The Anatomy of Transubstantiation 3). One example, Samoth Yarb’s *The Anatomy of Et cætera*, appears at first to resemble Savile’s *The Anatomy of an Equivalent*. Yarb’s title suggests an abstract dissection of the phrase ‘*et cætera*.’ He describes his short dialogue as an “unfolding of that dangerous *Oath* in the close of the Sixth *Canon*,” which, he says, has been “Condemned and dissected in a passionate Conference betwixt the two zealous Brothers *Roger* and *Ralph*” (Yarb). In contrast with Savile’s anatomy, however, Yarb describes his dissection as a kind of punishment-by-satire, following the just condemnation of English Bishops and their promiscuous use of the phrase *et cætera*. Yarb thus uses the anatomical epithet to remind his readers that dissection was the ultimate punishment for criminals in seventeenth-century England. With regard to his pamphlet, however, the text never climbs to the level of a systematic examination of his concept.

When we speak of the tremendous number of literary anatomies produced in early modern England, consequently, we do so in part because so many texts make this self-identification—and not because these texts have clear generic indicators. This project tries to overcome the problems of generic attribution by suggesting the existence of a basic mental framework, which functions in the background of most ‘anatomies.’ I have referred to this structure as the ‘anatomical mode;’ but perhaps it is better to speak of an anatomical framework, as a kind of epistemological metaphor. Historically anatomy has represented the promise of integration. In more recent times, anatomy has come to signify the abstracted division of knowledge into its constituent parts, which, as d’Alembert argues, does not always result in its reintegration. In both instances,

however, anatomy is a term that suggests related ways to represent and organize the universe and knowledge.

In the introduction I stated that this project amounts to a search for the intellectual source of the anatomical form. In pursuing this source, I have argued that the systematic integration of the human body offers the chief analogy, by which all anatomical ventures (medical and literary) might be measured. Throughout this project I have positioned seemingly dissimilar projects in close proximity, with the hope of illuminating the historical persistence of ‘body’ as a foundational principle of organization. This arrangement has allowed me to place literary productions such as John Donne’s memorial poem, *The Anatomy of the World*, in the same company with Leibniz’s theoretical plan for a universal library—not as anatomies, but as anatomical. Consequently, as it should now be evident, I am not arguing for the concretization of the anatomy as genre. In fact, I believe that we can talk about anatomy only as an epistemological metaphor, because a truly defined literary genre never materialized. Nevertheless, if we work backward from the intellectual framework of these productions, as these essays have, we can begin to characterize certain literary productions as anatomical, or not.

For the purpose of future examinations, I believe the following theses will be helpful.

- Anatomy assumes the existence of a system, or ‘whole.’ In the case of human anatomy, this system is the body itself. For all other types of anatomy, the ‘whole’ can be any subject, or object that discloses a measure of structural integration—including words, which, as John Wilkins argues, are composed of an array of significations that have been integrated through historical usage and mutual compact (Wilkins 13).
- Anatomy exists on the supposition that systems are composed of parts. Furthermore, anatomy aims at revealing the parts of a system. According to anatomist Helkiah Crooke, parts are defined in a very specific manner, as bodies “cohearing or cleaving to the

whole” (Crooke 28). Coherence refers to the structural associations formed by related function and usage.

- The structural interactions of function and use tend to give anatomical arrangements a non-linear appearance. In the human body, non-linear organization is an obvious consequence of spatial distribution: organs can be dispersed throughout the body and still maintain a connection based on integrated function. In the case of literary anatomies, however, the dimensional constraints of flat media (i.e., paper, books) make non-linear organization more problematic—and it is here that most anatomical productions tend to differentiate, resulting in an assortment of text/image solutions, as well as narratological innovation. From this standpoint, Andreas Vesalius’ *De humani corporis fabrica* and Laurence Sterne’s *Tristram Shandy* stand on similar footing. I would argue, in fact, that they are homologous structures, though obviously not generic equivalents. On the one hand, *De fabrica* attempts to create a cross-spatial arrangement that mimics the integration of a three-dimensional system in textualized form. In like fashion, Sterne experiments with narratological structure—creating a system of spatial, temporal and logical digressions throughout the text—which allows him to relate Tristram’s biography in a manner that accommodates the non-linear paths of mental association and memory reconstruction. History itself—or more precisely, the way that the mind accesses history—is the system being plotted on the page.

Of course, additional explorations of the intellectual genealogy of anatomy are necessary. This project has not addressed anatomical productions from the Middle Ages, or those from the age most affected by the Enlightenment, the Romantic period. With regard to the former, scholarship on the organization of knowledge in the medieval period seems to demonstrate a lack of major innovation leading up to the thirteenth and fourteenth centuries—following Europe’s

‘recovery’ of many classical texts through Arabic translations during the twelfth century. Furthermore, because the science of medical anatomy did not experience any serious changes until the fourteenth century, I have tried to limit my discussion to the Renaissance and the following periods. I believe, however, that the same methodology can (and perhaps should) be applied to earlier texts of the middle ages.

With regard to the nineteenth century, systematic organization appears to have been absorbed into the various sciences. Linnaeus’ taxonomic classification of the late 1700s represents an entirely cross-spatialized system for imagining the species as branches of a genetic tree. At the turn of the century, Erasmus Darwin (and later his grandson, Charles Darwin) speculated that the entire assortment of animal life on earth arose, as if by multiple digressions, from “one living filament” (Darwin).¹ Thus the history of life itself resembles a three-dimensional map of possible enchainments.

In the arts, however, we witness a desire to break with systematic representations of society and life. The romantic poets typify an attitude previous linked with traditional understandings of the mystery of existence. In “Tintern Abbey,” Wordsworth expresses his wish to reclaim

[...] that blessed mood,
In which the burthen of the mystery,
In which the heavy and the weary weight
Of all this unintelligible world
Is lighten’d--that serene and blessed mood,
In which the affections gently lead us on,
Until, the breath of this corporeal frame,
And even the motion of our human blood
Almost suspended, we are laid asleep
In body, and become a living soul:
While with an eye made quiet by the power
Of harmony, and the deep power of joy,
We see into the life of things (110).

In Wordsworth’s imagination, the body resumes its microcosmic status—this time as the stage of contemplation. The motion of the blood circulating through the body—that most important

of English discoveries—is a less desirable subject than the movements of the soul. Though dominant in the formation of scientific methodology, anatomical structures in the hands of the romantic poet have only ancillary value. The epistemological metaphor that had been so dominant in the seventeenth and eighteenth centuries becomes, more and more, a specialized idiom of science in the nineteenth century. Thus the anatomical venture appears to have parted from the literary, at least for a time.

Endnotes:

¹ See Volume 1. Section XXXIX. Of Generation. IV. 6.

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