

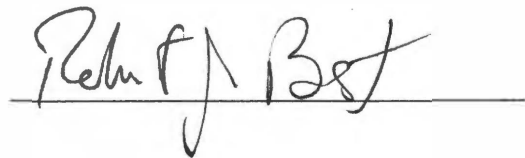
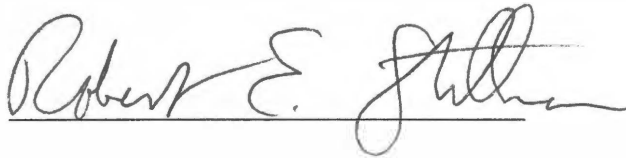
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I am submitting herewith a dissertation written by Susan Giesemann North entitled "Finding Nature's Order: Stoicism, Humanism, and Rhetoric in Francis Bacon's New Philosophy." I have examined the final paper copy of this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy, with a major in English.



Janet Atwill, Major Professor

We have read this dissertation
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Acceptance for the Council:



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FINDING NATURE'S ORDER:
STOICISM, HUMANISM, AND RHETORIC IN
FRANCIS BACON'S NEW PHILOSOPHY

A Dissertation
Presented for the
Doctor of Philosophy
Degree
The University of Tennessee, Knoxville

Susan Gieseemann North
May 2007

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DEDICATION

This dissertation is dedicated to my husband, David North, whose encouragement,
support, and belief in my ability have helped make it possible;
to my daughter, Carman North,
whose quick mind and ready wit continue to spur me to keep up with her;
and
to the memory of three extraordinary teachers,
my parents, James Giesemann and Betty Wyatt Giesemann,
whose lifelong love of learning was my first and best example;
and my husband's grandfather, William R. North,
who was everything a professor of English ought to be.

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I would like to thank the members of my committee for their advice and mentorship. My director, Professor Janet Atwill, who first introduced me to the Stoics, provided me with a different perspective for understanding Francis Bacon's view of nature and the new philosophy. Her advice has been invaluable as I worked with the Stoic texts, and she has been for me an example of what it means to be an excellent scholar of rhetoric. Most importantly, she has been a source of encouragement and friendship during the unavoidable dark days of dissertation writing. Professor Robert Stillman, whose own work on Francis Bacon's relationship to the universal language movement broadened my understanding of Bacon's place in the early modern period, has always been both rigorous and generous in his advice. He too has provided me with a model of dedicated and exacting scholarship. Professor Mary Jo Reiff came late to my committee, but has been a careful reader, engaging audience, and good friend. I am grateful to Professor Robert Bast, who agreed to serve near the end of the process, and whose meticulous reading I found very helpful. In addition, there are those who were part of my committee at the beginning of this project. I benefited from the advice of Professor Owen Bradley, regarding the literature of the scientific revolution. Most especially, my thanks go to Professor Linda Bense-Meyers of the University of Denver, who first introduced me to the rhetoric of Francis Bacon, and whose teaching, encouragement, and friendship have meant so much to me over the years.

It is a commonplace that graduate school and the writing of a dissertation are lonely endeavors, but I have had the encouragement of many good friends along the way.

I especially thank my great friend David Haines, who has read many drafts and given me excellent advice, as well as sympathy and encouragement when the path seemed hard to find. To Georgia Caver, my first friend in the English Department, I offer my unqualified affection and appreciation for many discussions of Renaissance and more modern matters. I am also grateful for the advice and encouragement of my friends Jeremy Webster and Paul Jones, who, though out of sight, are never out of mind. During the final lap of this race, I have been grateful for the friendship and fellow-suffering of Michelle Greenwald and Anne Snellen. I am especially grateful for Michelle's proofreading skills. Last, but not least, are the members of my family whose love has been a continuing source of strength. They are too numerous to thank individually, but I could not have succeeded without their love and support.

ABSTRACT

Francis Bacon has long been considered a significant figure in the Scientific Revolution, but debate continues regarding the significance and quality of his contribution. Although Bacon claimed to be developing a natural philosophical movement, he contributed little to methodological or theoretical aspects of the work that would eventually become modern science. Bacon's contributions should be evaluated within the context of Renaissance humanism rather than modern science, to the extent that in arguing for a turn to natural philosophy his aims were more consistent with the broad societal goals of his fellow humanists than the more limited ambitions of those pursuing natural philosophy. Bacon's methods were those of a skilled apologist, thoroughly trained in rhetoric, arguing for the study of nature as the basis for a better society. In arguing for the study of natural philosophy as the foundation for his Great Instauration, Bacon used concepts and commonplaces culled from a range of ancient texts, including schools both earlier and later than Plato and Aristotle. Among the ancient philosophies whose influence on Bacon has been insufficiently studied is Stoicism, which understood the cosmos as the embodiment and working out of reason, often identified as god. Stoicism provided a way for Bacon to rationalize the study of nature as compatible with the dominant Christian theology of the day. This dissertation examines the ways in which Bacon's philosophical project relied on Stoicism, both as a source of rhetorical commonplaces, and as a model for the synthetic and comprehensive philosophical system he hoped to institute. Within the context of civic humanism, Bacon blended the Stoic concept of nature as normative with the Renaissance commonplace of nature as a second divine text to authorize the pursuit of natural philosophy. The wise men of Solomon's House in Bacon's *New Atlantis* combine aspects of the contemplative Stoic sage with the humanist concept of the prudentia embodied in the *vir bonus*. I argue that the Royal

Society is evidence of the success of Bacon's Great Instauration and that he helped create the space in which such a collegial society committed to the study of nature could develop.

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PREFACE

The availability of primary texts for this dissertation might be described as either feast or famine. In the case of the works of Francis Bacon, there are so many different editions that references in the secondary literature are sometimes difficult to locate. For convenience, I have relied primarily upon John M. Robertson's anthology, *Philosophical Works of Francis Bacon*, which contains the *Advancement of Learning* and its Latin translation, *De augmentis scientiarum*, the *Novum Organum*, the *Essays*, and a few of Bacon's minor natural philosophical texts. References to this work are indicated by the abbreviation *PW*, followed by the page numbers. I have also tried always to indicate which of the philosophical texts is being cited. For the letters and other philosophical texts that are not included in the Robertson anthology, I have provided a full citation.

As is noted in the text, many Stoic texts are no longer extant and are known only by reference in other ancient texts. These Stoic fragments are available in a number of collections, including *Doxographi Graeci* by Hans Diels and *Stoicorum Veterum Fragmenta* by H. von Arnim. With the exception of extant works such as those of Cicero, Diogenes Laertius, Plutarch, and Seneca, I have relied on the English translation of Greek and Latin fragments in *The Hellenistic Philosophers* by A. A. Long and D. N. Sedley. The translations are arranged by topic into chapters and given an alphabetical designation. References to the translations of primary sources from this volume are designated *HP*, followed by the chapter number and letter reference (e.g., *HP* 26A). Citations of the annotations and other secondary material in this text follow the standard MLA format for parenthetical citations.

Justus Lipsius's *Physiologiae Stoicorum Libri Tres, L. Annaeo Senecae* is a primary representation of Seneca's Stoic natural philosophy in the Renaissance. This text has not been translated into English and the translations here are mine.

LIST OF ABBREVIATIONS

Abbreviations for Bacon's texts

<i>Adv.</i>	<i>The Proficiency and Advancement of Learning, Divine and Human</i>
<i>de Aug</i>	<i>De dignitate et augmentis scientiarum</i>
<i>Inst. Mag.</i>	<i>Instauratio Magno</i>
<i>NO</i>	<i>Novum Organum</i>
<i>PW</i>	<i>Philosophical Works of Francis Bacon</i>

Abbreviations for Stoic texts

<i>DL</i>	<i>Diogenes Laertius</i>
<i>De fin.</i>	<i>De finibus bonorum et malorum</i>
<i>HP</i>	<i>The Hellenistic Philosophers</i>

INTRODUCTION

The period between the late sixteenth and early eighteenth centuries has been seen as a critical time in the transformation of the Western mind from a Renaissance humanist intellectual tradition, which privileged rhetoric as an epistemological architectonic, to a modern, positivist world view, which privileges the scientific method as a way of structuring our understanding of the world. Twentieth-century historians attempting to write a history of science began to call this transformation the “scientific revolution” because they viewed the changes associated with it as both novel and radical. According to this history, the scientific revolution does not refer merely to methodological changes, but involves profound alterations in the way human beings viewed themselves and their place in the world. For example, during the Middle Ages and Renaissance, the accepted view of the cosmos placed human beings at the middle of a Great Chain of Being, inferior to God and the angels, but superior to animals, plants, and inanimate matter. Just as humans imperfectly reflected God’s perfect nature, the physical world reflected actions in the human realm, so that disturbances in human society were mirrored in the natural world. After the scientific revolution, which saw the establishment of a mechanistic worldview, human beings have increasingly seen themselves as nature’s subjects rather than its masters. For example, in the twentieth century and beyond, genetic factors are believed not only to determine physical characteristics, but to predispose one to certain types of behavior as well. Because science is secured by the regularity of natural law and the rigorous application of scientific method it suggests the availability of a kind of certainty or “truth” and obviates the need for the arts of contingency that preceded it. It is difficult to understate the significance and magnitude of the changes that began in the sixteenth century, and in that sense the metaphor of revolution is an appropriate one. However, to the extent that “revolution” also represents change that is an abrupt and

radical departure from what has gone before, the metaphor leads us to focus on the differences between distinct eras rather than on their points of intersection and commonality. One particularly significant consequence of using the metaphor of revolution is its inadequacy to account for the ways “nonscientific” philosophies, practices, or arts of earlier eras have contributed to the formation of what we now call science.

Recently, historians of science have begun to question the accepted tradition that the scientific revolution and have focused, instead, on the intersection of science and the broader culture. In *Leviathan and the Airpump*, their exploration of the conflict between Thomas Hobbes and Robert Boyle regarding experimental method, Steven Shapin and Simon Shaffer argue that “there is a conditional relationship between the nature of the polity occupied by scientific intellectuals and the nature of the wider polity” (332). There is no question that there is a conditional relationship between and the wider polity and any number of institutions, such as religion or education, as well as science. In the case of the development of modern science, Renaissance humanism was among the most powerful influences on the “wider polity” within which the “polity occupied by scientific intellectuals” developed. It is one thing, however, for a new institution to gain authority among a group of adherents, but quite another for it to gain authority within the wider culture. It is often the case that a significant persuasive effort is required to open a space within the larger polity for a new institution to develop. Certainly, humanism, to the extent that it recovered ancient texts of all kinds, provided much of the fuel that impelled this so-called revolution by inserting many “new” ideas into the culture of the Middle Ages. These new ideas included natural philosophy as well as moral and ethical philosophies.¹ In this sense, humanism created the conditions in which modern science

¹N.B. It should be noted that humanism is not, itself, a philosophy, nor does the curriculum that is the unifying element of humanism include philosophy. See Oskar Kristeller, *Renaissance Thought and Its*

could begin to develop. In the case of the scientific revolution, the humanist project also provided the tools, specifically, the art of rhetoric, by which natural philosophers and those who were sympathetic to their work began to achieve epistemological legitimacy for their ideas. Thus, understanding the epistemological change that has been called the scientific revolution requires a fuller picture of the ways that humanists both planted and nurtured the seeds for the development of modern science.

Francis Bacon has long been considered a significant figure in the scientific revolution, but there continues to be much debate regarding the significance and quality of his contribution. Bacon has been called by some a “father” of science, while others have characterized his contributions to modern science as a “joke.”² I argue that this disparity in evaluations of his work arises in part as a result of examining his ideas from the perspective of modern science, rather than attempting to understand his work in terms of his own era. Bacon, himself, is responsible for much of the difficulty in evaluating his contributions. Although he claimed to be developing a natural philosophical movement, he contributed very little to the theoretical aspects of the work that would eventually become modern science. In addition, his insistence upon the novelty of his ideas belied his debts to previous philosophical systems. Bacon’s contributions should be evaluated as those of a humanist rather than those of a philosopher, to the extent that in arguing for a turn to natural philosophy his goals were more consistent with those of his fellow humanists than the more limited ambitions of those who were actually involved in the investigation of the natural world. While he certainly attempted to influence the “polity occupied by scientific intellectuals,” to use Shapin and Shaffer’s terms, his primary achievements were in influencing the “wider polity.” His methods were not those of the natural philosopher, but those of a skilled apologist, thoroughly trained in rhetoric,

Sources, for an extended discussion of humanism. This does not, however, negate the fact that many of the texts recovered by humanists were philosophical.

² Alexandre Koyré is a primary critic of Bacon. See *Galileo Studies*, 39, n. 6.

arguing for the study of nature as the basis for a better society.

In making the case for the study of natural philosophy, Bacon used concepts and commonplaces from the whole range of ancient texts, from histories to philosophies. He not only culled concepts from the most famous thinkers, such as Plato, Aristotle, and Cicero, but deployed ideas from many other ancient Greek and Roman natural philosophers, including several atomists from Democritus to the Epicureans. Among the ancient philosophies whose influence on Bacon has been insufficiently studied is that of the Stoics, particularly the philosophical works of Seneca, the Roman dramatist, moralist, and philosopher. Stoicism, which is based on the notion that reason is the immanent and guiding force of nature, held many concepts that were amenable for use of early modern natural philosophers. Historian William Bouwsma has argued that Renaissance Stoicism should be understood to have two strains, Augustinian and Stoic, the latter of which is particularly concerned with the perfection of human rationality, while the former is more closely allied with Augustine's theological concerns. This dissertation examines the ways in which Bacon's philosophical project relied heavily on Stoic humanism, both as a source of rhetorical commonplaces, and as a model for the kind of syncretic and comprehensive philosophical system he hoped to institute.

Traditional narratives of the scientific revolution and of humanism have suggested that the two are incompatible with one another. Chapter One, "The Humanist Background to the Scientific Revolution," reviews the historical literature on the scientific revolution and humanism. I argue that the metaphor of "scientific revolution," denoting as it does radical and sudden change, obscures the full range of the epistemological complexity that characterized the late Renaissance and early modern periods. Most twentieth-century narratives of the scientific revolution have focused primarily on the internal history of science, ignoring the ways in which humanism helped to make a space within the broader culture for natural philosophy to develop. I argue that the philosophical works of Francis

Bacon offer an opportunity to study the ways in which humanism served as an incubator for the nascent practices that would become modern science. Histories that have portrayed Bacon as anti-humanist have not recognized the ways in which the ancient philosophy of Stoicism provided a model for Bacon's "active" science and was a source of commonplaces that allowed him to reconcile a number of cultural conflicts. Although many twentieth-century narratives of the scientific revolution have largely represented it as a triumph of Platonism over Aristotelianism, the philosophical background of the Renaissance was much more complex than these narratives suggest. I build upon William Bouwsma's argument that Renaissance humanism comprised two specific strains, one of which was heavily influenced by ancient Stoicism. I summarize the basic tenets of Stoicism, which was transmitted directly through ancient texts recovered by the humanists and indirectly through Christian theology, and examine the ways in which the philosophy influenced the development of Renaissance thought.

Bacon recognized that education was the primary vector through which humanist values and ideas were disseminated throughout the culture. His first philosophical work and the one that he says constitutes the first part of his *Instauratio Magno* was *The Advancement of Learning* in which he describes a complete reformation of learning, including institutional and curricular reform. In Chapter Two, "Advancing the New Philosophy Through Humanist Institutions: The Influence of Stoic Humanism on Bacon's New Philosophy," I argue that the comprehensive and syncretic nature of Stoicism provides a model for the comprehensive educational system that Bacon proposed. This educational system, which is founded upon natural philosophy and is organized according to a model of faculty psychology that emphasizes reason as an organizing principle, follows Stoic epistemological principles. I argue that Bacon's rationale for his inductive method, which he describes as a "kind of logic," is founded on concepts from Stoic epistemology. The method itself is not particularly successful because it relies on the only

art with which Bacon himself was actually familiar, the art of rhetoric. While Bacon's method *per se* is not effective, his argument for the study of nature, i.e. "things themselves," is ultimately successful. I also argue that the "universality" that Bacon claims for his method and that he demonstrates in his *Essays* is related to the Stoic view of an organic, systematic, and comprehensive philosophy.

Twentieth-century historians have represented Bacon's "plain style" as "anti-humanist" and "anti-rhetorical." However, when considered within the broad and diverse context of Renaissance discourse, Bacon's rhetorical practice was not radically out of step with that of his contemporaries, nor is it so modern that later readers find it more familiar than that of his contemporaries. What is unique in Bacon's theories of discourse, however, is the degree to which he situates rhetoric within his understanding of human psychology. In Chapter Three, "Stoic Influence on Bacon's Rhetoric and Discourse," I argue that when viewed within its appropriate context of the Stoic strain of Renaissance humanism, Bacon's discursive theory is neither anti-humanist nor anti-rhetorical, but is consonant with the Stoic linguistic theories and with the values, goals, and practices of civic humanism. I analyze Bacon's *Instauratio Magno* as a rhetorical "map" of the intellectual processes involved in his reform of learning.

In the fragmentary *New Atlantis*, Bacon presents a society in which his ideas are realized. At the center of this society is a philosophical institution in which educated men are engaged in scientific studies that are intended to benefit the society. At the center of this institution is a model of a wise natural philosopher. The concept of the wise man or sage is one that is shared by Renaissance humanism and Stoic philosophy, although the concept of the wise man in humanism differs in significant ways from that described in Stoic philosophy. In Chapter Four, "The Stoic Sage in the House of Solomon," I argue that the philosophers of the House of Solomon, who are primarily engaged in empirical and experimental studies, are examples of the Baconian concept of the sage. The well-

ordered nature of Bacon's imagined society demonstrates his view that the Stoic ideal of behaving appropriately in accordance with nature must be combined with the humanist value of utility to society. Further, the sage, as Bacon conceptualizes him, is one who fully integrates, or "embodies" all aspects of the arts: practical, theoretical, and productive.

In closing, I examine Bacon's influence, not in the twenty-first century, but in an era much closer to his own. I argue that the Royal Society is evidence of the success of Bacon's Great Instauration and that he succeeded in creating the space in which such a collegial society committed to the study of the natural world could safely exist. What has been called the scientific revolution could only happen because a space for it to occur was opened by those like Francis Bacon, skilled in the art of rhetoric and operating within a humanist matrix. Bacon blended the Stoic attitude of nature as normative with the notion that nature was a second divine text and with the values of civic humanism to authorize the pursuit of natural philosophy.

CHAPTER ONE

THE HUMANIST BACKGROUND TO THE SCIENTIFIC REVOLUTION

“Bacon, the founder of modern science” is a joke and a bad one at that, that one can still find in the textbooks. In fact Bacon understood nothing about science. He was credulous and completely uncritical. His manner of thinking was closer to alchemy and magic (he believed in ‘sympathies’), in short to that of a primitive or to a thinker of the Renaissance than to that of a Galileo or even a scholastic.

—Alexandre Koyré³

The new-found land Bacon sighted was not something to be won in a generation or by machines alone. It would have to be drawn slowly, by infinite and continuing effort, out of minds whose dreams must rise superior to the existing world and shape that world by understanding of its laws into something more consistent with man’s better nature. . . . Bacon’s science, as he formulated it, was to have taken account of man himself and to have studied particularly the ethical heights to which individuals, and perhaps after them the mass might attain. His “second world” as his late fragment, *The New Atlantis*, indicates, was to be a world of men transformed, not merely as we know them amidst the machines of the twentieth century. Thus parts of Bacon’s dream lie beyond us still. . . . It was his task to summon the wise men, not for one day’s meeting or contention, not to build a philosophy of permanence under whose shadow

³ *Galileo Studies*, 39, n. 6.

small men might sit and argue, but to leave, instead, a philosophy forever and deliberately unfinished—not, as he so ably put it, as a belief to be held but rather as a work to be done.

—Loren Eiseley⁴

The period between the latter part of the sixteenth century and the end of the eighteenth century comprised a critical time in the transformation of the Western intellectual tradition from a Renaissance humanist tradition, which privileged rhetoric as a means of dealing with cultural issues, to a modern, rational, and positivistic world view that privileges “science” as a way of gaining objective information that can be used to understand the world.⁵ Simply put, during the early modern period, the focus of intellectual efforts changed from one that emphasized what “ought” to be done to one concerned with what “is.”⁶ This change was so momentous and so pervasive that it came to be known by the middle of the twentieth century as the “scientific revolution,” the nature and extent of which continues to be debated at the beginning of the twenty-first century. In a similar fashion, Francis Bacon’s role in the scientific revolution has been the subject of continuing debate, as the two passages at the beginning of this chapter suggest.

⁴*Francis Bacon and the Modern Dilemma* 14-16.

⁵ There is considerable slippage in the names applied to the historical periods under consideration here. Most troublesome is the term Renaissance, which is reckoned to have begun quite early in Italy and arrived in northern Europe and England, the subject of this dissertation, quite a bit later. Generally, I have used the term *medieval* to refer to the period between the fall of Roman empire and the end of the thirteenth century, but I am primarily concerned with Scholasticism and its emphasis on Aristotelian dialectic as an epistemological architectonic; *Renaissance* refers to the period from 1300 to the end of the sixteenth century, which saw the rise of humanism with its emphasis on rhetoric as the preeminent epistemological art; *early modern era* refers to the period from 1600 to 1800 during which the new philosophy was established. The life of Francis Bacon (1561-1626) began in the late Renaissance and ended in the early modern period, and his works in many ways reflect the intellectual ferment of this transitional period.

⁶ The notion that the change from humanism to science is a move from concern with “ought” to “is” is a twentieth century commonplace used to describe the move from a teleological to an ontological world view. See, for example, Wayne Booth’s use of this commonplace in his critique of positivism and “irrationalism,” *Modern Dogma and the Rhetoric of Assent*. See also Victoria Kahn, *Rhetoric, Prudence, and Skepticism in the Renaissance*.

Scientist Loren Eiseley praises Bacon as a great innovator and prophet of science, as “the man who saw through time” (28), while historian of science Alexandre Koyré, in more generous moments, accepts Bacon’s description of himself as a “buccinator,”⁷ or herald of science (*Galileo Studies* 39), but at other times, insists that labeling him as a scientist is a “joke” (39, n6). While Bacon’s influence on the development of early modern science is certainly open to question, both views of Bacon reflect the perspective of those inside an institutionalized science that did not fully emerge until more than one hundred years after Bacon’s death. Eiseley’s extravagant praise is justified by a general correspondence between the prevailing twentieth-century narrative of the development of modern science and Bacon’s description of a productive natural philosophy, despite the fact that Bacon’s own inductive method is not known to have been used to any great degree by anyone but Bacon himself. It is true, as Koyré claims, that Bacon was not a scientist in any sense that we would recognize today. He may have dabbled at experimental science, but he made no significant contributions in any area of scientific endeavor.⁸ He was not significantly involved in the new experimental natural philosophy, nor did he help to develop the mathematical and theoretical aspects of modern science. It is also true that Bacon’s judgments about the work of other natural philosophers were not always accurate.⁹

⁷ The term “buccinator” was Bacon’s own (*buccinator novi temporis*). See Brian Vickers’ discussion of the metaphors Bacon used to describe the prophetic nature of his enterprise in *Francis Bacon and Renaissance Prose* 3-5. Koyré’s understanding of the term “buccinator” would not likely coincide with Bacon’s. For Koyré, Bacon was *merely* a buccinator of science; for Bacon, with his Renaissance sensibilities of the power of language, to announce the arrival of a new philosophical age was, in a sense, to make it so.

⁸ Koyré’s dismissal of the view that Bacon was a scientist is perhaps buttressed by the standard story of the end of Bacon’s life that he died of a cold or pneumonia contracted while stuffing dead a chicken with snow as part of an impromptu experiment to determine the possibility of using cold as a food preservative. Jardine and Stewart, in their recent biography, suggest that the story is apocryphal and that the cold was, instead, a result of his experimenting with nitre or some other chemical to cure a recurring condition. It seems clear, however, that whatever his experiments were, they were neither executed methodically nor documented.

⁹ According to Brian Vickers, “Bacon was unaware of many of the new developments of his age and when he did hear of them he rejected them out of hand to return to the traditional theories—so he was either ignorant of or indifferent to the work of Kepler, Copernicus, Galileo, Napier’s logarithms, Harvey’s

However, Koyré's judgments are based on criteria of modern science that did not exist when Bacon was writing in the seventeenth century. Implicit in Koyré's view of Bacon as a buccinator of science who "merely" announced its arrival are certain assumptions about the degree to which theories and practices that we now call science had already attained epistemological and cultural authority within early modern culture. Also implicit in Koyré's willingness to grant Bacon's status as a herald of modern science is the assumption that the epistemological authority for early modern natural philosophy was inherent in its theories and practices, so that the only task for Bacon and others like him was to announce its arrival. However, the experience of Koyré's own candidate for the father of modern science, Galileo Galilei, who suffered excommunication and house arrest for advancing his theories regarding the heliocentric universe, demonstrates that the knowledge advanced by early modern natural philosophers was not universally regarded as self-evident.

The difficulty Galileo experienced in gaining acceptance for his theories regarding celestial mechanics illustrates certain epistemological conflicts of the Renaissance and early modern periods, consideration of which is necessary for delineating Bacon's contribution to the development of modern science. Galileo's model of a heliocentric universe was controversial because it fundamentally contradicted a cosmological model based upon ancient astronomical observations made without benefit of technological aids and buttressed by theology and Aristotelian natural philosophy, which conceptualized the cosmos as a teleological creation in the process of actualizing its potentiality.¹⁰ However, many Renaissance thinkers privileged biblical authority and

discovery of the circulation of the blood, and William Gilbert's *De Magnete*, one of the few pieces of empirical research in the Renaissance, which he rejected scornfully. Gilbert, he said, 'hath made philosophy out of the observations of a loadstone'." (*Francis Bacon and Renaissance Prose* 2). It is not inconceivable that Bacon's lack of appreciation for Galileo is in part responsible for Koyré's lack of appreciation of Bacon.

¹⁰ Steven Shapin provides a concise description of the Aristotelian background for Ptolemy's cosmology. See *The Scientific Revolution* 17-30.

the ideas of ancient thinkers over the new discoveries of their contemporaries. Thus, regardless of the accuracy of Galileo's observations and calculations, or the validity of his conclusions, and no matter how many individual adherents his theories gained, larger cultural institutions, particularly the Catholic Church, resisted such radical theories. Galileo, who was educated in the humanist tradition, attempted to use rhetorical strategies¹¹ to make his ideas less threatening to those who were not disposed to accept them but was unable to circumvent this institutional resistance. Galileo's experience makes it is clear that as important as it is to understand the development of science as an institution, it is equally important to understand how the knowledge and practices that we now call science gained epistemological authority in a world in which religion and what beliefs we would now call superstition were the lenses through which many viewed an earth-centered universe.

The institutional resistance that Galileo attempted to circumvent was the focus of Bacon's efforts regarding the advancement of natural philosophy, efforts which, despite his claims to the contrary, were primarily rhetorical rather than theoretical. Bacon's contribution to modern science ought to be seen, not as the discovery of new natural knowledge, the truth of which was incontrovertible, but as the establishment of a framework within which natural knowledge could be perceived as authoritative by the larger culture. Bacon was eminently suited for such a task. By virtue of his education and subsequent public life, Bacon was a quintessential humanist. He was trained in rhetoric and committed to the active life of service to king and country, first as a solicitor, later as a member of Parliament, and ultimately as Lord Chancellor, the most exalted official in

¹¹ In *Novelties in the Heavens*, Jean Dietz Moss analyzes Galileo's attempts to situate his theories within the rhetorical context of the Renaissance. Galileo published his theory of cosmology in the then-common form of a dialogue, hoping that the controversial nature of his view might be diluted when presented as one of a number of perspectives, including the traditional view. For more on Galileo's attempts to argue for his ideas see also Mario Biagioli, *Galileo, Courtier*, and Dava Sobell, *Galileo's Daughter*. Both examine the ways in which Galileo's work was both made possible and constrained by the wider polity of court and church.

the land, under King James I. Bacon's early education focused on the classical texts¹² valued by the humanists. As an adult and a self-proclaimed philosopher, however, he rejected both the Aristotelian dialectic of the scholastics and the copious rhetoric of the humanists in favor of modes of thought and communication that were more appropriate for his interest in natural philosophy. This does not mean that he rejected classical philosophy and rhetoric altogether. Classical ideas informed Bacon's system for natural philosophy. Rather than being a rejection of classical philosophies, his new philosophy is an eclectic blend of ideas and concepts from the most ancient pre-Socratic Greek philosophers and more recent Greek and Roman philosophies such as Epicureanism and Stoicism. In addition, Bacon's practice of rhetoric is as closely tied to classical models as was the copious Ciceronian rhetoric he rejected, and his reform of learning owes as much to classical thought as did the traditional humanistic model. Along with many of his contemporaries Bacon rejected Cicero's writings as the ideal for eloquent discourse, imitating instead the rhetorical models of the Roman writers Tacitus, Marcus Aurelius, and Seneca, all of whom were Stoics. Bacon's imitation of these rhetorical models is not *merely* stylistic, however. In the Renaissance, eloquence was not seen as mere style, but reflected the character of the speaker. For the Stoics, style was directly related to thought. Bacon's adoption of Stoic style brought with it a whole set of beliefs about the relationship between language, thought, and nature.

Koyré is ultimately correct that Bacon's method is of little or no value. While Bacon's *Novum Organum* presents an elaborate justification and explication of his method, it is essentially an empty vessel that is not particularly worthy. However his critique of the epistemological status quo and justification of natural philosophy as a

¹² At Oxford, Bacon's education included the works of Livy, Caesar, Sallust, Demosthenes' *Orations*, Homer's *Iliad*, Cicero's *Complete Works*, and the rhetorical handbook, the *Ad Herennium*. He also studied Plato, Aristotle, Hermogenes, and Xenophon, Greek grammar and logic (Jardine & Stewart 35).

means of discovering truth and improving the human condition were both effective and eloquent. In sum, Bacon's contribution to the scientific revolution was primarily persuasive, deploying ancient ideas and rhetorical practices of the humanist tradition to the end of establishing nature as a source of authoritative and reliable knowledge, which could in turn serve as a foundation for making moral, ethical, and political judgments and for materially improving the human situation. If Bacon did not participate in the "scientific revolution," per se, he certainly helped to create a space within which it could occur, lending his exceptional rhetorical ability to deploying ancient ideas in the cause of reviving natural philosophy.

Renaissance Humanism

If we are to understand how the ideas and practices that are the precursors of modern science, many of which directly contradicted accepted ways of knowing, came to have epistemological authority during the early modern period, it is necessary to examine the intellectual context of the time. In particular, it is important to understand the influence of Renaissance humanism on the formation of European culture. To a large degree, the Renaissance derived its energy from the conflict between medieval attitudes and beliefs and the "new" attitudes and beliefs contained in ancient texts recovered by individuals whom we now call humanists. The earliest humanists, beginning with Francesco Petrarch,¹³ contributed to the intellectual ferment of the Renaissance through the recovery and dissemination of classical Greek and Roman texts.¹⁴ Petrarch, who

¹³ Though Petrarch is known today primarily as the author of a sequence of sonnets, he is perhaps the prototypical humanist. He sponsored emissaries who went throughout Europe and the Hellenistic world looking for manuscripts of ancient texts.

¹⁴ The literature of humanism is vast. A number of anthologies provide an overview of its history, faces, and extent. See, for example, Albert Rabil's three-volume work, *Renaissance Humanism*. See also *The Cambridge Companion to Renaissance Humanism*, ed. Jill Kray.

welcomed these ancient texts as a breath of fresh air in the stale intellectual atmosphere of the late medieval era, wrote:

I associate greedily with our ancients in the only way I can, and I forget most willingly those among whom an evil star decrees that I must live. And I strain all the powers of my mind to flee the moderns and to seek the ancients, because the sight of my contemporaries offends me deeply while the remembrance of the noble deeds and glorious names of the past fills me with . . . incredible delight.¹⁵

While it is perhaps an exaggeration to suggest that the medieval era was a time of ignorance and superstition, as the erstwhile term “dark ages” might suggest, it was a time that valued stability more than change.¹⁶ Medieval epistemology was secured by remnants of ancient learning, by the knowledge revealed in divine texts, and by the theological tradition handed down from the early church fathers. The social structure, which was grounded in the same traditional epistemology, was stable to the point of rigidity. Intellectual activity, which was largely cloistered within the church, the newly-founded universities, or professions such as law, consisted in large part of applying Aristotelian categorical logic to particular cases.¹⁷ The recovery of ancient texts by the early humanists, however, challenged the stable attitudes and beliefs of medieval Europeans. The term *humanism* is a neologism coined in 1808 by German educator F. J. Niethammer to distinguish the emphasis in secondary education upon classical languages and literatures from new scientific education.¹⁸ However, the term is derived

¹⁵ *Four Dialogues for Scholars*. 157, n. 24.

¹⁶ See Johan Huizinga, *The Waning of the Middle Ages*, for an extended description of the late Middle Ages. Huizinga does not see the era as an intermediate period between the fall of the Roman Empire and the European Renaissance, but as a distinct period with its own characteristics.

¹⁷ This is, of course, an oversimplification. There was, for example, a resurgence of interest in natural philosophy, as well as interest in what are now called pseudo-sciences, alchemy and astrology, all of which are immediate antecedents of the renaissance of natural philosophy.

¹⁸ It is perhaps ironic that the term *humanism* only came into use as the practices it names were beginning to wane. Peter Burke suggests that the term was coined in Germany at a time when the study of the classics

from a much older word, *humanist* (Latin *humanista*), itself coined, apparently as university slang, during the Renaissance from the ancient term *studia humanitatis*, which was used by Cicero and others to describe the liberal education of the Hellenistic age. During the late quattrocento, *studia humanitatis* referred specifically to a program of study that included grammar, rhetoric, history, poetry, and moral philosophy. The *studia humanitatis* included the study of Latin, and to a lesser extent, Greek texts.¹⁹ This rather narrow definition of humanism is the only acceptable one, according to P.O. Kristeller, who rejects the tendency to expand the definition to include new attitudes toward humankind, or to project it backwards to include those medieval scholastics whose work was based on ancient Greek texts. Kristeller argues that since the *studia humanitatis* excludes all philosophy except moral philosophy, as well as other fields such as mathematics and law, it is desirable to limit the definition to what can be connected to this particular range of studies. Though Kristeller's limited definition of humanism may be technically correct, it does not adequately explain the pervasive influence of humanism in the Renaissance. In reacting to those who would describe humanism overly broadly, or who would mingle the effects of humanism with other influences such as changes in the political environment, Kristeller risks understating the case.²⁰

was being excised from curricula in the gymnasia in order to make room for the study of the natural sciences (*The European Renaissance* 233-234). See also Paul Oskar Kristeller, *Renaissance Thought and Its Sources* for further discussion of the origin of the term.

¹⁹ This list of subjects is P.O. Kristeller's. The standard curriculum for an education in the arts included two parts: the trivium included three arts of verbal discourse, grammar, logic, and rhetoric; the quadrivium included four mathematical disciplines, arithmetic, geometry, astronomy, and music. For a brief but thorough discussion of the trivium and quadrivium, see William Bouwsma, *The Culture of Renaissance Humanism* 8. For a comprehensive discussion of the history of education during the late medieval period and Renaissance, see James Bowen, *A History of Western Education*, Vol. II: Civilization of Europe Sixth to Sixteenth Century. For the relationship between rhetoric and dialectic, see Peter Mack, *Renaissance Argument: Valla and Agricola in the Traditions of Rhetoric and Dialectic*.

²⁰ For further discussion of the limitations of Kristeller's definition of humanism, see Hanna Gray "Renaissance Humanism: The Pursuit of Eloquence," 499-500; also, Victoria Kahn, 198, n. 4. Kristeller's rigorous definition may also reflect the influence of the reductionism of positivistic modern science on other, non-scientific disciplines.

Nicholas Mann describes the pervasiveness of the influence of humanism's scholarly concern with the textual legacy of antiquity, which

involves above all the rediscovery and study of ancient Greek and Roman texts, the restoration and interpretation of them and the assimilation of the ideas and values that they contain. It ranges from an archaeological interest in the remains of the past to a highly focused philological attention to the details of all manner of written records—from inscriptions to epic poems—but comes to pervade . . . almost all areas of post-medieval culture, including theology, philosophy, political thought, jurisprudence, medicine, mathematics and the creative arts. Grounded in . . . learned research, it rapidly found expression in teaching. And in this way it was to become the embodiment of, and vehicle for, that very classical tradition that is the most fundamental aspect of the continuity of European cultural and intellectual history. (2)

While it is true that, as Kristeller argues, humanism was primarily an educational movement, its influence was much more far-reaching. First, as Mann argues, humanism was the vehicle by which large numbers of ancient texts were recovered and the ideas they contained were disseminated throughout Western culture from the twelfth century onward. Second, those who were educated in the humanist system, which included grammar schools as well as universities, went out into the world to become the courtiers, parliamentarians, foreign emissaries, local officials, and mercantilists who created the culture of the Renaissance. Third, and most importantly to this study, humanism provided the rhetorical context and the skills by which early modern thinkers, such as Francis Bacon, helped to authorize a variety of cultural changes that were inspired, in part, by these “new” ideas.

Hans Baron's understanding of humanism, rather than being curricularly defined as is Kristeller's, is related to the activities of those individuals whom he considered to be humanists. Baron coined the term "civic humanism" to differentiate it from the literary humanism of Petrarch and his contemporaries. This new civic humanism was a response to the crisis in Florentine government and instantiated by Salutati's book *On the Origin of the City of Florence and On Her Renowned Citizens*. From the end of the thirteenth century, according to Baron,

the ever-recurring leitmotifs in the humanistic philosophy of life were the superiority of the *vita activa* over the "selfish" withdrawal into scholarship and contemplation [*vita contemplativa*]; the praise of the family as the foundation of a sound society; and the argument that the perfect life is not that of the "sage," but that of the citizen who, in addition to his studies, consummates his *humanitas* by shouldering man's social duties, and by serving his fellow-citizens in public office. (7)

While Baron's concept of civic humanism is more contextualized than Kristeller's, it too is limited by its identification with the city of Florence and failure to account for the spread of civic humanism to other locales. Nevertheless, his conceptualization of humanism helps to explain why it is an engine of social and institutional change. Although ancient texts represented for the humanists an escape from the arid intellectual tradition of scholasticism, it would be a mistake to suggest that the move from an emphasis on the *vita contemplativa* to the *vita activa* was complete. Petrarch's desire to "associate with the ancients" rather than immersing himself in the civic life of contemporary society is representative of the tension between these modes, one which might be considered an essential tension of Renaissance humanism.

Like Kristeller, William Bouwsma has suggested that humanism must be considered primarily a phenomenon of educational practice. However, because he

recognizes that education more than other social institutions is sensitive to social change and that modifications to curricula may be taken as indicators of shifts in human values, his view of humanism allows for a broader interpretation than either Kristeller's or Baron's (*Culture of Renaissance Humanism* 7). Certainly, the relationship between humanist education and culture is an intimate and critical one. Bouwsma contrasts the Renaissance humanist emphasis on the *studia humanitatis* to the medieval emphasis on logic, natural philosophy, and metaphysics. Within the group of subjects designated as the trivium (grammar, logic, and rhetoric), medieval education emphasized logic. Renaissance humanists, however, were concerned with rhetoric and grammar, which included philology and the study of literature, as well as the study of the structure of the language. He characterizes that shift of emphasis as a move from a concern with testing knowledge through the methods of logic to a concern with finding or discovering knowledge from texts and communicating that knowledge to one's fellow citizens (7-9). As Bouwsma suggests, it is important to recognize that Renaissance humanism was not a coherent or monolithic institution and that it varied considerably even within Italy during the trecento and quattrocento, undergoing even greater change as it made its way throughout Europe.

The Scientific Revolution

During the Middle Ages and early Renaissance, natural phenomena, particularly unnatural or catastrophic ones, were seen as mysteries to be interpreted rather than explained because nature was believed to be subject to the actions of supernatural beings and the vagaries of human behavior.²¹ While it is an overstatement to suggest that there was a single view of nature, it is generally true that Europeans of the Middle Ages and

²¹ See Johan Huizinga's *The Waning of the Middle Ages* for a lengthy discussion of medieval European attitudes regarding humans and nature.

Renaissance saw nature as part of a hierarchical system, a “great chain of being,”²² that extended from the celestial realm to the material world, in which humans enjoyed a privileged position between God and angels and the lesser elements of nature such as animals, plants, and inanimate matter. Any member of the chain was subject to those above it and could be influenced by their actions. Raphael Holinshed’s description of the unnatural and monstrous consequences of the murder of King Duffe of Scotland (the event which served as the source for Shakespeare’s *Macbeth*),²³ illustrates perfectly the way in which these beliefs permeated the culture.

For the space of six moneths together, after this heinous murther thus committed, there appeered no sunne by day, nor moone by night in anie part of the realme, but still was the skie couered with continuall clouds, and sometimes such outrageous winds arose, with lightnings and tempests, that the people were in great feare of present destruction. . . .

Monstrous sights also that were seen within the Scottish kingdome that yeere were these: horses in Louthian, being of singular beautie and swiftnesse, did eate their owne flesh, and would in no wise taste anie other meate. In Angus, there was a gentlewoman brought foorth a child without eies, nose, hand, or foot. There was a sparhawke also strangled by an owle. Neither was it anie less woonder that the sunne, as before is said, was continuallie couered with clouds for six moneths space. But all men

²² The concept of the great chain of being was discussed at length in Arthur O. Lovejoy’s book by that name. See also E.M.W. Tilyard, *The Elizabethan World Picture*, which explores the implications of the great chain of being on Elizabethan society. See Michel Foucault’s *The Order of Things* for a less totalizing representation of medieval and Renaissance worldviews and the changes that took place between these eras.

²³ This description was published in Raphael Holinshed’s *Chronicles of England, Scotland and Ireland*. Cited by Waithe in Introduction to *The Tragedy of Macbeth* 1121.

understood that the abhorrible murder of king Duffe was the cause
heereof. (qtd. by Waithe in Introduction to *The Tragedy of Macbeth* 1121)

The events are medieval, but the description itself was published in 1577 and again in 1587 in an edition edited by John Hooker.

This anthropocentric view of nature was also reflected in the beliefs of natural philosophers of the early Renaissance, who continued to hold to a model of the cosmos advanced during second century of the Common Era by the Greek astronomer and geographer Claudius Ptolemy. Ptolemy situated the earth at the center of a series of concentric spheres, which rotated in perfect circles. Each successive sphere exhibited a greater degree of perfection in its composition and inhabitants, with the most perfect outer sphere being inhabited by God. Ptolemaic cosmology was based in part on observed experience but was also informed by ancient philosophy and the tenets of the Judeo-Christian religion. The Ptolemaic model depends largely upon the physics of Aristotle, who regarded the universe as matter in a state of unrealized potential moving toward an unknown *telos*, or goal (Shapin, *The Scientific Revolution* 29-30).²⁴ The appeal of such a teleological orientation for a society so wholly dominated by Judeo-Christian theology is obvious. This cosmological model illustrates the ways in which natural philosophies and theology were integrated with and mutually constitutive of one another.

In the early modern era, however, Ptolemaic cosmology began to be challenged by the results of empirical observation and renewed interest in mathematics. The Polish prelate Nicolaus Copernicus was the first to posit a heliocentric universe. Copernicus's theory was a result of his inability to reconcile mathematically the Ptolemaic model with his own observations of planetary orbits. Aware of the implications of his model for

²⁴ For a comprehensive explanation of Aristotle's teleology and its implications for physics, see Guthrie, vol. VI 106-129. For a brief explanation of the teleological nature of Aristotle's physics, see Shapin, *The Scientific Revolution* 29-30.

contemporary culture and concerned about the possible consequences, Copernicus published abstracts of his mathematical work in 1532, but did not publish the whole of his theory until 1543, the year of his death. Early in the seventeenth century, Galileo Galilei, working from even more accurate observations made possible by his telescope, confirmed Copernicus's theories and challenged the Ptolemaic model even further when he observed sun spots on the supposedly perfect and immutable surface of the sun. While he found an audience for his work outside his native Italy, Galileo was eventually imprisoned, tried, and excommunicated from the Roman Catholic church for his views because in challenging Ptolemaic cosmology, he also challenged the theology on which it and, indeed, social, political, and religious hierarchies were founded.²⁵

Similar challenges to the fundamental conceptualization of nature and its concomitant hierarchical social structure occurred throughout Western culture during the Renaissance, supplying the context in which modern science was formed. The newly rediscovered texts of ancient philosophies, advances in technology, and social, political, and cultural changes evoked powerful reactions from all classes. These reactions ranged from skepticism to fear, from animosity to hatred, from disagreement to censure. In more extreme cases, those who were advancing new and apparently heretical ideas faced exile and even execution. John Donne's poem, "The First Anniversary" offers a description of the intense anxieties at work in the seventeenth century:

And new philosophy calls all in doubt,
The element of fire is quite put out,
The sun is lost, and th'earth, and no man's wit
Can well direct him where to look for it.

²⁵ Recent scholars, notably Mario Biagioli, *Galileo, Courtier*, and Dava Sobel, *Galileo's Daughter*, have suggested that Galileo's trial had less to do with perceptions of his work as heretical and more to do with political expediency for Pope Urban VIII, who had previously been Galileo's patron.

And freely men confess that this world's spent,
When in the planets and the firmament
They seek so many new; they see that this
Is crumbled out again to his atomies.
'Tis all in pieces, all coherence gone,
All just supply, and all relation;
Prince, subject, father, son, are things forgot. . . (ll. 203-214)

The “new philosophy” that Donne suggested was responsible for the cultural confusion of his era has come, in subsequent ages, to be seen as the foundation of the “scientific revolution.”

During the first third of the twentieth century, perhaps as part of constructing a modernist narrative in the wake of the trauma of World War I,²⁶ historians and philosophers began to examine epistemological shifts between the early seventeenth and mid eighteenth centuries, which they called the “scientific revolution.” However, the use of the term “revolution” to refer to a change in knowledge during this era was not completely new to the twentieth century. I.B. Cohen²⁷ contends that the concept has a long tradition, and traces the use of the term “revolution” in the works of natural philosophers, such as Francis Bacon and Joseph Priestley.²⁸ He contends that “from the

²⁶ Philosopher Stephen Toulmin suggests that the scientific revolution is part of a retroactive narrative of modernity that he dates to the first third of the twentieth century. See *Cosmopolis*, Toulmin’s exploration of modernity, 5-44.

²⁷ Cohen examines applications of the term “revolution” to development of modern science in *Revolution in Science* 75-101, 473-569. See also H. Floris Cohen, *The Scientific Revolution: A Historiographical Inquiry*; John R. R. Christie, “The Development of the Historiography of Science” in R. C. Olby, et al., *Companion to the History of Modern Science* 5-22; and David C. Lindberg, “Conceptions of the Scientific Revolution from Bacon to Butterfield” in Lindberg & Westman, *Reappraisals of the Scientific Revolution* 1-26.

²⁸ It is unlikely, however, that in the seventeenth century, the term carried quite the same connotations as it does today. According to Hanna Arendt, it was not until the end of the eighteenth century that “revolution” gained its contemporary meaning of violent upheaval, “the notion that the course of history suddenly begins anew, that an entirely new story, a story never known or told before is about to unfold” (21). Thus, it is unlikely that the term carried quite the same meaning for these early natural philosophers as it does for twentieth and twenty-first century historians of science. In fact, during the early modern period, *revolution*

late seventeenth century onward, scientists and historians of science have used the language of political revolution (or political warfare) to describe the progress of science” (473). By the late eighteenth century, Cohen argues, the idea of a revolution in science was fully established, as demonstrated in the works of historians Jean-Sylvain Bailly and Jean Étienne Montucla, both of whom link Copernicus’ reconfiguration of the universe to the idea of revolution, though neither actually uses the term “Copernican revolution” (498-99).

In the twentieth century, historians began using the term “scientific revolution” to describe the epistemological changes that occurred during the early modern era. One of the earliest examinations of the scientific revolution, was E. A. Burt’s *The Metaphysical Foundations of Modern Physical Science*, published in 1924. Burt laments the way that the scientific revolution resulted in a demotion of humankind’s place in the universe and characterizes the worldview of the Middle Ages as one in which

man was in every sense the centre of the universe. The whole world of nature was believed to be teleologically subordinate to him and his eternal destiny. . . . The prevailing world-view of this period was marked by a deep and persistent assurance that man, with his hopes and ideals, was the all-important, even controlling fact in the universe. (4)

This worldview underlay all inquiry and, as in the case of physics, the world was interpreted through categories, which “developed in the attempt to throw into scientific form the facts and relations observed in man’s unaided sense-experience of the world and the main uses which he made it serve” (5). According to Burt, the scientific revolution represents a shift from a teleological world view, in which humankind’s journey to reach its own potential was reflected in the events of the physical world, to an ontological

generally referred to cyclical repetition of events, such as the annual progression of the seasons. Consequently, Bacon used the term “new instauration” to convey the novelty, magnitude, and *revolutionary* nature of his thought.

perspective, in which humankind was one of many equal factors in a mechanistic universe:

[J]ust as it was thoroughly natural for medieval thinkers to view nature as subservient to man's knowledge, purpose and destiny; so now it has become natural to view her as existing and operating in her own self-contained independence, and so far as man's ultimate relation to her is clear at all, to consider his knowledge and purpose somehow produced by her, and his destiny wholly dependent on her. (10-11, italics in original)

Burt views much of the course of modern philosophy as a succession of attempts to recover humankind's spiritual sovereignty, the failure of which demonstrates the overwhelming dominance of the new ontological world view (11). Burt's regrets regarding the consequences of the scientific revolution were soon replaced by the views of other historians with more positive perspectives on these changes.

Exploring the metaphysical dimensions of the reform of Aristotelian physics, Koyré describes the scientific revolution as a struggle so intense that it amounted to a veritable "mutation" in human thought (*Galileo Studies* 1). Koyré suggests that the scientific revolution is nothing less than the "destruction of the Cosmos . . . the most profound revolution achieved or suffered by the human mind since the invention of the Cosmos by the Greeks. It is a revolution so profound and so far-reaching that mankind . . . for centuries did not grasp its bearing and its meaning" ("Galileo and Plato" 19-20). It is a revolution that "changed the very framework and patterns of our thinking and of which modern science and modern philosophy are, at the same time, the root and the fruit" (*Closed World* v).²⁹ Koyré considers the apex of the scientific revolution to be

²⁹ Koyré's metaphors reveal a great deal about the way the modern era has come to view the scientific revolution. The notion that modern science and philosophy are both the "root and fruit" of the scientific revolution quite perfectly demonstrate the tautological conceptualization of modern scientific evidence as "self-evident."

Galileo's application of Archimedes' principles of mathematics to the study of movement, transforming physics from a purely empirical science to a theoretical one, liberating humankind from the "concrete world-space conception of the pre-Galilean physics" into the "homogeneous and abstract space of Euclidian geometry" (19-20). For Koyré, the scientific revolution is largely attributable to a triumph of the Platonic worldview over the Aristotelian tradition. Ultimately, Koyré views the scientific revolution as the result of a change in world view from a hierarchically ordered universe whose different levels are subject to the control of those superior to them on the chain of existence to an "open and infinitely extended" universe whose laws may be apprehended through a "hypothetico-deductive mathematical treatment" ("Galileo and the Scientific Revolution" 2).

Other historians of science have explored the nature of the scientific enterprise. C. C. Gillespie sees modern science as contiguous with Greek natural philosophy to the extent that it constitutes "conceptual thought mediating between consciousness and nature" but claims that modern science is superior to the extent that it is "determinate instead of speculative" (9). Where Greek science imposed subjective categories on nature, the new science is "impersonal and objective" because, while it is founded upon empirical observation, the data are expressed mathematically and tested experimentally for their ability to predict outcomes and generate new concepts (9). Rupert Hall defines natural science as "the conscious, systematic investigation of the phenomena revealed in the human environment and in man himself objectively considered" (xi). Such investigation is founded on the assumption that "there is in nature a regular consistency, so that events are not merely vagarious, and therefore an order or pattern also, to which events conform, capable of being apprehended by the human mind" (xi).

Perhaps the single most important concept underlying the scientific revolution is the notion that there is a "regular consistency" in nature, for it is this concept that gave

epistemological authority to natural philosophy. Marie Boas Hall argues that this new view, in which nature is characterized as “a vast and intricate piece of machinery,” provided the “ingredient of rebellion from the past which is so often a necessary stimulus to the creative thinker in any field” (31). She also suggests that the “concept of the world as a machine gave a new meaning to the idea of a physical law; for laws of nature could now be apprehended as expressions of the way in which God had built the machine and the way he intended it to run. Hence physical laws had real meaning and existence, and the task of the scientist was to find these laws out” (“The Machinery of Nature” 32). E. J. Dijksterhuis, in *The Mechanization of the World Picture*, argues that this view is the very foundation of modernity:

It was this conception that first led to the methods of research and treatment that have caused the great flourishing of physical science . . . of which we are reaping the fruit in our own day: experiment as the source of knowledge, mathematical formulation as the descriptive medium, mathematical deduction as the guiding principle in the search for new phenomena to be verified by experimentation. It was the subsequent success of this conception which made the development of technology possible, thus leading to the sweeping industrialization without which the life of modern society has long since become inconceivable. It was finally the modes of thought inherent in this conception which penetrated into philosophical thought about man and his place in the universe, and into numerous special sciences which at first seemed to lack all contact with the study of nature. Owing to all these factors the mechanization of physical science has become much more than an internal question of method in natural science; it is a matter that affects the history of culture as a whole. (3)

These various views of the history of science, regardless of how narrow or broad their claims for scientific “revolution,” share one thing. They all hold to an “internalist” view of science; that is, they are concerned with the internal development of science as an autonomous knowledge-producing activity. According to philosopher of science Steve Fuller, the “main historiographical assumption [of the internal history of science] is that there is a natural trajectory to the development of science when it is regarded as a knowledge producing activity” (*Philosophy of Science* 7). Koyré puts it more poetically when he describes the scientific revolution as a “world-bubble [that] grew and swelled before it burst and merged with the space that surrounded it” (*Closed World* vi). However, although it was never intended to do so, Koyré’s metaphor also describes the way that science is not quite so easily detached from the other cultural institutions that surround it. The same is true for Marie Boas Hal’s contention that physical laws had “real meaning and existence” as “expressions of the way God had built the machine and had intended it to run” (32). Duijsterhuis, too, when he describes the modernity of sciences uses metaphors that are more appropriate to the humanist context than to that of science. In order for the new natural philosophy to flourish, diverse reactions of theologians, philosophers, and statesmen had to be addressed and overcome. In explaining the emergence of science, it is important not merely to explain how science itself advanced, but also to show how it came to be seen as an acceptable, authoritative endeavor within a cultural context many of whose fundamental beliefs were directly contradicted by its findings. In other words, we must account not only for the development of “science,” but for its epistemological and institutional positioning within the larger culture.

In contrast to internalist views of the history of modern science, externalist histories of science examine the relationship between science and society. The externalist view is concerned with identifying the cultural phenomena that led to the development of modern science. Among the earliest of the histories written from the externalist

perspective are that of Soviet historian Boris Hessen, *The Social and Economic Roots of Newton's 'Principia'*, published in 1931, and *The Social Function of Science*, published in 1939 by English Marxist historian J. D. Bernal. Both works draw correlations between elements of the economic and cultural context of the early modern period and the progress of science.³⁰ Sociologist Robert K. Merton in his 1938 *Science, Technology, and Society in Seventeenth Century England* argued that the development of modern science in the seventeenth century was linked to the rise of Protestantism, particularly of Puritanism. More recently, Frances Yates' studies of the Hermetic Corpus and its influence on philosophers of the early modern period such as Copernicus and Newton, who are revered for their contributions to the formation of a rational, positivistic science, have called into question the integrity of seventeenth century "science."³¹

By the turn of the twentieth century, externalist views of the scientific revolution have come to question whether such a phenomenon may legitimately be said to have occurred. Steven Shapin begins his sociological examination of these changes, *The Scientific Revolution*, with the oxymoronic assertion, "[t]here was no such thing as the Scientific Revolution, and this is a book about it" (1).³² Shapin's account of the move to science in the early modern era recognizes the degree to which what is now called "science" — an institution that, since the early twentieth century, has often been portrayed as being isolated from the arena of ordinary human activity by its objective methodology — remains a socially and historically situated institution. According to

³⁰ Porter contends that the work of Hessen and Bernal are often dismissed by historians of science as "vulgar Marxism" because they lack critical perspective (33-39).

³¹ In Yates's view, internalist histories of science have failed to interrogate the influence of disciplines that have, in subsequent eras, come to be seen as "pseudo-sciences". She has investigated the influence of the Hermetic corpus in a number of texts, including *Giordano Bruno and the Hermetic Tradition*, 1964, *The Rosacrucian Enlightenment*, 1972, and *The Occult Philosophy in the Elizabethan Age*, 1979.

³² See also Shapin *The Social History of Truth* and Shapin and Shaffer, *Leviathan and the Air Pump*. For other similar views, see *Nature and Society in Historical Context*, ed. by Mikulás Teisch, Roy Porter, and Bo Gustafsson; see also *Scientific Renaissance in National Context*, ed. by Roy Porter and Mikulás Teisch.

Shapin, the scientific revolution is characterized by four changes in the way early moderns viewed knowledge: 1) metaphors of mechanization were increasingly used to describe natural processes and occurrences; 2) humans increasingly saw themselves as separate from their objects of study in the natural world, particularly as related to distinctions between human experience of the natural world and explanations of that world; 3) epistemological practices were methodized with the end of objectifying knowledge, i.e., preventing human subjectivity from tainting scientific knowledge; and 4) early moderns began to realize their humanistic impulse to put objective knowledge to work for the benefit of human society (12-14).

Because he maps the place of science within the larger culture, Shapin's account of the scientific revolution helps to clarify the intellectual terrain of the early modern era. He recognizes that the new epistemology arose out of and was enabled by activities unrelated to the intellectual practices we now call science, activities related to the Renaissance passion for recovering ancient knowledge. He suggests, for example, that the humanist recovery of ancient texts spurred the practice of natural philosophy as a way of verifying ancient "truth" (75-76). Shapin also recognizes that seventeenth-century attempts to change beliefs about nature and the means for securing such beliefs, were not incidental but self-conscious and deliberate (75). Finally, he explores ways in which "facts" came to be constructed during the seventeenth century,³³ and acknowledges that practitioners used "social and linguistic techniques" (84) to achieve adherence to these facts. In *Leviathan and the Air-Pump*, a case study of controversy surrounding Robert Boyle's experiments with air pump, Shapin and Simon Shaffer identify three points of interaction between the progress of science and politics:

³³ See 84ff.

First, scientific practitioners have created, selected, and maintained a polity within which they operate; second, the intellectual product made within that polity has become an element in political activity of the state; third, there is a conditional relationship between the nature of the polity occupied by scientific intellectuals and the nature of the wider polity.

(332)

Because they begin with the scientific polity, however, Shapin and Shaffer do not explore the means by which space was made within the wider polity for “scientific” activity to take place. Moreover, though Shapin recognizes that it was influential in the development of early modern science, he defines humanism merely as a concern with recovering ancient knowledge by restoring ancient texts corrupted by medieval copyists to a pristine condition (75-76). Shapin, like many others, fails to examine how the culture of Renaissance humanism enabled the development and expansion of nascent scientific institutions. This failure to examine the role humanism played as a context in which modern science could be formed has led historians to conclude that these two systems had opposing trajectories, with humanism declining as science arose. In particular, it is important to understand the impact of the linguistic and rhetorical practices of Renaissance humanists in authorizing early modern science as a legitimate intellectual activity.³⁴

The Decline of Humanism and the Rise of Science

Many historical accounts of humanism have traced a trajectory that is opposite that of the scientific revolution. The history of the scientific revolution suggests that

³⁴ In *Leviathan and the Air-pump*, Shapin does examine rhetorical and linguistic implications of debates about early modern science; however, he fails to examine the extent to which these are part of, or a legacy of, the humanist project.

science and humanism are so incompatible with one another that they cannot coexist. Perhaps no one has been more influential in advancing this notion than historian Richard Foster Jones, who cast the scientific revolution as a “battle” in which the scientific moderns triumphed against the humanist affection for the ancients. Jones argues that the Elizabethans who contributed to the development of modern science were reacting against a perception of nature as a creation in the process of decay, a view that they had inherited from the classical tradition.³⁵ According to Anthony Grafton, “until the last generation or so most historians of civilization, literature and art assumed that Renaissance humanism died as the sixteenth century wound to a close” (204). The markers of humanism’s demise were the replacement of Latin with vernacular languages, the rise of natural philosophy, and the notion, which he attributes to Montaigne, that ancient philosophies had nothing to offer to an age so radically different (204-5).

To a large extent, the belief that humanism gave way to science can be accounted for by the decline in the fortunes of rhetoric, the art that was central to the humanist project. Rhetoric was not merely a communicative art, but was a means of inculcating a set of values that were seen as essential to developing the ethos of a Renaissance courtier.³⁶ In an age in which social status had become much more fluid and trained individuals were needed to administer new governmental entities, rhetorical education provided not only the means for ambitious courtiers to adopt the appropriate personae, but also to develop skills they needed for their work in the civic arena. The epistemological anxiety that characterized the Renaissance not only helped to form a context for the growth of science, but also led to a crisis within humanism. Victoria Kahn describes the trajectory of Renaissance humanism as one in which the belief in the

³⁵ Foster’s *Ancients and Moderns: A Study of the Rise of the Scientific Movement in Seventeenth Century England*, was revised and reissued in 1965.

³⁶ See Janet Atwill, *Rhetoric Reclaimed*, for a discussion of humanist education as the inculcation of values.

possibility that rhetoric can move the individual to prudence, or right action, evolved into skepticism about the effectuality of texts and even of language itself. Implicit within this trajectory is a conflict between values and facts, between “ought” and “is”. In *Rhetoric, Prudence, and Skepticism in the Renaissance*, Kahn argues that

[w]ithin the humanist tradition, it is only those texts of the later Renaissance, in which the analogy between rhetoric and prudence is subject to doubt For many of these authors, the rhetorical dimension of the text can no longer be contained by practical concerns; rather, it is conceived of as threatening, aberrant, resistant to the author’s intention to persuade to right action. (21-22)

Eventually, Kahn continues, the rhetorical element of texts gives way to “literariness” as epistemological standards change:

[T]he eighteenth century development of a formalist aesthetics . . . coincided with the redefinition of politics in terms of science rather than prudence. When mathematical certainty is taken as the standard of reason in politics as well as science, then the aesthetic realm of prudential deliberation . . . must be redefined in terms of mere subjective experience. (24)

Early Renaissance rhetorical activity, according to Kahn, grew out of the conjunction of the rediscovery of ancient texts and political conditions in the Italian city-states. New translations of Aristotle’s *Rhetoric* and *Nicomachean Ethics*, along with Ciceronian texts, were readily received by individuals who were open to the argument that “the activity of the prudent man is analogous to that of the orator” (30), i.e., the prudent individual employed the same strategies in making wise judgments that the orator used in finding effective arguments. Kahn argues that although classical rhetoric had as its provinces the law courts and democratic governments, Renaissance rhetoric was “a

truncated version of its classical ancestor, since as the legal and political dimension of rhetoric falls away, only epideictic—the rhetoric of praise and blame—remains” (38). However, this truncation of rhetoric is not merely “an anticipation of properly aesthetic conception of literature” (38).³⁷ Rather, she says, “if the conflation of rhetoric and poetics diminishes the sphere of rhetoric as it was classically conceived, it enlarges the sphere of literature, since the written text now takes on the functions of deliberative and judicial rhetoric” (38). Whereas classical rhetors invented arguments by arguing on either side of a question (arguing *in utramque partem*), they presented only a single side in the law courts or forum. However, Renaissance writers, because their arguments were not constrained by such specific situations, could always argue both, or many, sides of a question. The frequent use of the dialogue as a means of exploring controversial issues demonstrates this aspect of Renaissance rhetoric (38). For the early humanists, rhetoric was a practical art that was as concerned with process as with product, or perhaps more accurately, saw product as equivalent to process. Kahn argues that

Renaissance humanists . . . go beyond their classical mentors in conceiving of literature not only as the cause and effect of prudence and right action (i.e., the writer is presumed to be prudent and to inspire prudence in others), but as a form of prudence itself. Rhetoric here is not primarily conceived of in terms of style or ornaments, but in terms of its capacity to exemplify and encourage the activity of practical reasoning. (39).

According to Kahn, humanist rhetoric was inescapably related to moral philosophy, and this relationship was founded on two assumptions:

³⁷ In fact, the dialogue was the form that Galileo adopted when he published his theories on the structure of the solar system, *Dialogue on the Two Chief World Systems*. Galileo hoped to blunt the force of his theory by presenting it along with the received model as a conversation among learned men struggling with competing worldviews.

First, the prudence or practical wisdom that is at work in deliberation about action in a social or political context is also at work in the artist's production of a work of art. Prudence is, in this sense, the precondition of artistic decorum, just as it is of ethical decorum. As a result, the work of art is seen less as a product as reflecting a certain process or activity of judgment. Second, and consequently, the reader's knowledge of the text (or any other work of art) can only be practical, since the act of reading requires the same acts of discrimination, the same judgments of decorum as does the author's practice of writing. Thus, the practice of interpretation, like the practice of writing, exemplifies for the humanist the inseparability of rhetoric and moral philosophy. (39)

This linkage of rhetoric and moral philosophy in the Renaissance is surprising, perhaps, given rhetoric's historical reputation for being abused by unethical practitioners, but Kahn traces its development from ancient texts. Beginning with Aristotle, Kahn argues, rhetoric comprises "a practical standard of judgment reflected in common linguistic usage legitimated by the orator's appeal to common sense, his arguments by consensus, opinion, and commonplace" (33). Cicero develops this view of rhetoric, arguing in *De oratore* that the "good orator is necessarily a good man" and, in *De officiis*, that moral goodness and decorum, *honestas* and *utilitas*, cannot conflict" (34). He further legitimizes rhetoric by drawing parallels between the practice of rhetoric and Academic skepticism. Kahn shows that "[s]ince man, according to the skeptic, can know nothing absolutely, he is always concerned with the realm of the contingent and the probable, that is, the realm of rhetoric" (34). Moreover, the skeptic and orator share a rejection of dogmatism and the ability to argue *in utramque partem*, although the skeptic is less concerned with persuasion (35).

According to Kahn, early humanist rhetoric synthesizes aesthetic, political, and religious factors:

Aesthetic decorum is seen to be inseparable from political effectiveness, and in both cases the possibility of such decorum is seen to be not only compatible with cognitive skepticism, but contingent upon it. But this skepticism about the power of human reason is itself just the opposite side of faith in divine will. The view that the impossibility of theoretical knowledge leaves room for action and practical certainty explains the benign role of both skeptical and hypothetical arguments in early humanist texts. (44)

However, this synthesis did not long survive. As Kahn points out, the very acceptance of rhetorical wisdom undermines the standard, i.e., faith in divine will, that legitimizes that acceptance: “The legitimacy of the prudential judgment’s claim to be something more than mere subjective preference depends on an available standard of judgment, but this standard is ultimately an article of faith that by definition cannot justify itself before the court of skepticism” (46).

By the late sixteenth century, the reemergence of Pyrrhonism, the more radical form of ancient skepticism, which challenged rather than supported religion, as well as advances in natural philosophy, undermined the humanist project and the status of rhetoric. According to Kahn, these changes meant that “skepticism and faith were no longer allied [and] faith itself had become an object of skepticism, and along with faith, the possibility of practical wisdom” (47). Later humanists, such as Erasmus, questioned the existence of a standard for practical wisdom, using the “humanist emphasis on discursive activity as constitutive of moral philosophy” (54). Nevertheless, these later humanists, and early modern figures, such as Montaigne, and Hobbes, continued to work

within the humanist tradition to the extent that the means by which they questioned that tradition was rhetoric itself.

Stoic Humanism as Context for the Scientific Revolution

The view that humanism and science are incompatible may be explained, in part, by an overly narrow definition of humanism. In “The Two Faces of Humanism,” William Bouwsma argues that, while Kristeller’s identification of rhetoric as a kind of “lowest common denominator for humanism” helps to simplify an enormously complex movement, it may underestimate its variety and historical significance (19). He argues that the humanist art of rhetoric “was also the vehicle of a set of intellectual conflicts crucial to the development of European culture in the early modern period” (19-20). Like Kristeller, Bouwsma recognizes that humanism, despite a coherent and cohesive objection to scholasticism, was hardly a unified movement, and that its conflicts were perhaps more characteristic than its agreements. Bouwsma disputes the commonly held notion that the Renaissance is a triumph of Platonism over Aristotelianism because the philosophy of the Middle Ages was not simply Aristotelian, but was a much more eclectic mix, while Renaissance humanism “owed at least as much to Plato as Aristotle” (5). Second, neither the Aristotelian nor the Platonic tradition was primarily interested in rhetoric,³⁸ which was the central preoccupation of the humanist program. Finally, Bouwsma argues that to the humanists of the Renaissance, Aristotle and Plato were systematic philosophers who shared the same cultural moment and seemed to resemble

³⁸ Although neither was “primarily” interested in rhetoric, it was certainly of great concern to both Aristotle and Plato. Plato’s reaction to rhetoric was primarily negative, and it plays an essential role in at least three of his dialogues, *Gorgias*, *Protagoras*, and *Phaedrus*. Only in the *Phaedrus* does Plato find any role for rhetoric at all, and then only when it is subordinated to dialectic. Aristotle’s handbook of rhetoric is an extensive discussion of the art. In contrast to Plato’s discussion of the ethical dimensions of the art, Aristotle’s *Rhetoric* is a *techné*, a handbook that sets forth strategies for practice of the art. While not necessarily more important than his other works during his own era, it was among the most widely studied of his works during the Renaissance.

each other more than to differ. The debates about Plato and Aristotle in which humanists engaged were more likely academic exercises than contests regarding issues of central concerns. Thus, he says, the search for the intellectual antecedents of the Renaissance should focus on Hellenistic derivations rather than the original Hellenic philosophies; Stoicism and Augustinianism make much better candidates for explaining the contradictions inherent in Renaissance humanism (4-6).

Bouwsma recognizes the difficulties in seeking explanations for humanist dichotomies in these two traditions. Neither is particularly easy to define since both are large, synthetic, and essentially unsystematic schools of thought. Moreover, Augustinianism is, as Marcia Colish demonstrates,³⁹ considerably influenced by Stoicism. Despite significant areas of overlap, Bouwsma suggests that the dichotomy can be synthesized fairly easily in general terms. Stoicism, he argues, “for the humanist, was sometimes a fairly particular set of beliefs, but it was also the particular form in which the pervasive and common assumptions of Hellenistic paganism presented themselves most attractively and forcefully to the Renaissance” (7). Augustinianism, on the other hand, is “a slow, steady, though incomplete advance from a Hellenistic understanding of Christianity, which sought to reconcile the Gospel with the commonplaces of later antique culture, toward an increasingly biblical understanding of Christianity” (8). Bouwsma describes the conflict in this way:

The issue between them, in its most direct terms, was the difference between the biblical understanding of creation, which makes both man and the physical universe separate from and utterly dependent on God, and the Hellenistic principle of immanence which makes the universe eternal, by one means or another deifies the natural order, and by seeing a spark of

³⁹ See *The Stoic Tradition from Antiquity to the Middle Ages*, volume II. Colish demonstrates at length the complex interplay between Christianity and Stoicism in Augustine’s philosophy.

divinity in man tends to make him something more than a creature of God.

(9)

Bouwsma argues that it is this set of contradictions that energizes the humanist project and that ultimately, as Stoicism became secularized, the two were seen as complementary rather than antagonistic. Nevertheless, “such a reconciliation, which depended on the deracination of Stoicism, was obviously a reconciliation on Augustinian terms. Also, Stoicism had a peculiar facility for growing new roots” so that a resolution to the antagonism could never fully be realized (60).

Although the commonly held view is that “renaissance thinkers only drew isolated, practical ethical concepts from Stoic sources,” Bouwsma argues that there is a good deal more Stoic influence than has previously been recognized. In particular, he argues that much Stoic “inspiration” came, in fact, from its doctrines on the “divine, harmonious, and intelligible order of nature” (17). Bouwsma finds Stoic influences in the work of Valla, Vives, and even Calvin.⁴⁰ Calvin’s version of Adam, for example, is concordant with that of the Stoic sage, a man in whose mind reigned “perfect intelligence . . . uprightness . . . [whose] senses were prepared and molded for due obedience to reason; and in the body there was a suitable correspondence with this internal order” (*Commentary on Genesis*, qtd. in Bouwsma 19). For the Renaissance mind, reason was not a “legitimate source of religious insight” (20), but a resource for practical sense (21). Finally, Stoicism was a source of moral training, and since morality was closely associated with intellect, it could be closely connected to the humanist educational project (22-23).

⁴⁰ In this brief article, Bouwsma does not recognize the fact that Stoic influences in the works of these thinkers is more likely the result of their reliance on Pauline doctrine rather than on Augustinianism. Please see discussion of the Stoic influence on Pauline doctrine later in this chapter (43-46).

Stoicism was prominent among the historical influences that led to the Renaissance reconceptualization of what it means to be human. In *Renaissance Man*, her examination of Renaissance philosophy, Agnes Heller argues that any philosophy comprises two primary functions: to articulate a vision of objective reality and to develop a set of moral and ethical rules that reflect that vision. Stoicism, because it focuses on the objective world rather than on a theoretical hereafter, minimizes the dissonance between these two aspects of philosophy. This pragmatic nature of Stoicism had three significant consequences that made it a particularly attractive philosophy from the Renaissance perspective. First, the distinction between the philosopher and the layman was practically non-existent. This kind of active philosophy allowed for a synthesis of the humanist dichotomy between *vita activa* and *vita contemplativa*. Second, the Stoic emphasis on human autonomy was compatible with the developing sense of the human as an individual rather than a part of a community. Third, the ontological orientation of Stoicism helped to authorize the shift from a teleological to an ontological worldview.⁴¹ Certainly, the ontological world view and pragmatic nature of Stoicism, as Heller describes them, is consonant with that which historians of science have suggested made way for the development of modern science.

The Legacy and Transmission of Stoic Philosophy

Stoicism derives its name from an Athenian landmark, the Stoa or Painted Colonnade, where Zeno Citium (c. 333-261 BCE) regularly conducted public discourse. Zeno's philosophical system, which was among the most fully developed and comprehensive of any in the ancient world, flourished for more than four centuries, and

⁴¹ See Chapter three, "Stoicism and Epicureanism" for Heller's discussion of the role of Stocisim in the Renaissance, particularly 101-27.

spread from Athens to Rome and beyond.⁴² It found its way to Renaissance Europe principally through the writings of Romans of the imperial period, such as Cicero, Marcus Aurelius, Tacitus, and Seneca, and through the doxographic texts of the Greek historian, Diogenes Laertius and the Roman Plutarch. Though Stoicism was clearly pagan in origin, it offered much that would appeal to the Christian philosopher, particularly in its descriptions of the wise and virtuous individual. Thus, its influences are seen in the work of the early church fathers such as Augustine and Tertulian, who were educated in the Roman system. Its later influence can be seen in the deism and naturalism that were popular in the eighteenth century, not only in Europe but also among the founders of the American republic.

Stoicism is a synthetic philosophy, which drew from various ancient Greek philosophies. According to A. A. Long, Stoicism owes its ethical foundation to Socratic influence. For example, Zeno incorporated into his philosophy some basic Socratic propositions, among them, that “knowledge and goodness go hand in hand . . . ; from knowledge right action follows necessarily; and the greatest evil is a bad condition of the soul” (*Hellenistic Philosophy* 111). Zeno likely based his notion of a “creative reason” as cosmic principle on Plato’s divine craftsman or world soul, and he and his successors also borrowed from Aristotelian (from Aristotle’s own works and from his successors in the Peripatetic school) and Epicurean philosophies, as well as from other less well-known philosophers, such as Heraclitus and Diogenes (110-113). Despite its debts to its contemporaries and predecessors, Stoicism should not be considered a derivative philosophy, Long argues, for it altered what it found and pushed well beyond the

⁴² For thorough discussions of ancient Stoicism see A. A. Long, *Hellenistic Philosophy: Stoics, Epicureans, Sceptics*, and F. H. Sandbach, *The Stoics*. See also Marcia L. Colish’s two-volume work, *The Stoic Tradition from Antiquity to the Early Middle Ages*. The most comprehensive anthology of Stoic textual fragments is H. von Arnim’s *Stoicorum veterum fragmenta (SVF)*. Translations of the principal sources, with commentary, are included in A.A. Long and D. N. Sedley’s two-volume work, *The Hellenistic Philosophers*.

boundaries of what it borrowed from other schools of thought. Most importantly, Stoicism, unlike its predecessors, developed its philosophical tenets so fully that it became a comprehensive system that included three main branches—physics, ethics, and logic—that were almost inextricably intertwined. According to the Greek doxographer Aetius,

The Stoics said that wisdom is scientific knowledge of the divine and the human, and that philosophy is the practice of expertise in utility. Virtue singly and at its highest is utility, and virtues, at their most generic, are triple—the physical one, the ethical one, and the logical one. For this reason philosophy also has three parts—physics, ethics and logic. Physics is practiced whenever we investigate the world and its contents, ethics is our engagement with human life, and logic our engagement with discourse, which they also call dialectic. (*HP* I:26A)⁴³

Stoicism was an important philosophical movement throughout antiquity, and was widely practiced throughout the Roman world from the fourth century BCE until the fall of the Roman Empire. It continued to exercise influence even as ancient doctrines began to give way to Christianity as the primary philosophical and ethical system in Western Europe. Although Stoicism was no longer a recognized doctrine at the beginning of the Renaissance, certain concepts and ideas that were part of the philosophy continued to hold sway throughout the Middle Ages. As a result, Stoicism's influence in the Renaissance came not only through the recovery of ancient texts, but also through the received tradition of Christian theology.

⁴³ Aetius I, Preface 2. Aetius was a Greek doxographer, c. 100 CE. His works are not extant, but were recomposed from the works of Plutarch, Stobaeus, and others by H. Diels in the late 19th century and published in *Doxographi Graeci*.

One difficulty in studying Stoicism is that most of the available texts, which come from the time when Stoicism was already a fully developed and orthodox doctrine, are practical rather than theoretical in nature. There are no extant texts from the earlier Stoic philosophers, only fragments and reports in other works. Extensive reports of Stoic philosophy can be found in *Parallel Lives*, biographies of famous Greek and Roman philosophers by second century CE Greek historian Plutarch and in *Lives of the Philosophers* by Diogenes Laertius, a Greek doxographer of the third century CE. The works of Aetius were preserved in an anthology compiled by fifth century CE Roman Joannes Stobaeus for his son Septimus. Thus, Stoic theory, its antecedents, and its development are sometimes difficult to ascertain. It is perhaps this lack of theory as much as its lack of clear connection to pagan religion that made Stoicism an appealing doctrine for Renaissance thinkers. Many of the Stoic texts recovered by the humanists were in the form of dialogues on philosophy, letters of advice, and moral essays, which closely resembled the “self-fashioning” advice to which the Renaissance mind was accustomed. Cicero was not himself a Stoic but found much to admire about the philosophy except for their dismissal of rhetoric. He explored Stoic doctrine in several texts, including *De officiis* [*On Duty*], *De finibus bonorum et malorum* [*On the Limits of Good and Evil*], and *De natura deorum* [*On the Nature of the Gods*]. Seneca’s epistles and moral essays were widely read in the Renaissance, as were the works of Diogenes Laertius and Plutarch. These discussions of Stoic philosophy focused on moral advice rather than on the theory upon which the advice was based, so that the incompatibility between pagan and Christian theology and worldviews was not so apparent.

Stoicism & Christianity

Christianity originated and began to be disseminated during the last few centuries of the Western Roman Empire. The early church fathers were educated in the same

Hellenized system that prepared the leaders of the empire. Consequently, the church leaders were fully aware of the various philosophical systems that were part of the intellectual milieu of the time. Most of these philosophies were too inimical to Christianity to be of any value to the Christian cause. Epicureanism, for example, posited a rather randomly organized universe in which gods were not qualitatively superior to human beings. Skepticism, with its emphasis on suspension of belief, was equally antithetical to a religious movement. Stoicism, however, proved to be a valuable ally for the Christian fathers for two reasons. First, its strong emphasis on morality and its insistence upon acceptance of one's lot were useful adjuncts to the Christian morality and acceptance of God's will. More importantly, perhaps, was the Stoic belief in a rational force that directed the course of the universe. For most Stoics, even those who called this force "god," the deity was not necessarily identified by name so that the "god" of Christianity fitted the conceptualization as well as any member of the Roman pantheon. The concordance between Stoic philosophy and Christian doctrine is apparent in the epistles of St. Paul who was educated in the Roman tradition. Some early Christian writers found the connections so persuasive that a legend arose in the fourth century that the Stoic Seneca was converted by St. Paul, a belief that was seemingly substantiated by a body of correspondence between the two.⁴⁴ Though this series of letters was apocryphal, the fact remains that the tenets of Stoicism and Christianity had sufficient common elements that many early Christian writers felt the need to deal with it in one way or another. In her exploration of the legacy of Stoicism from classical antiquity to the middle ages, Colish argues:

[W]hether as men trying to make sense out of their own intellectual experience or as spokesmen of a beleaguered Christian community in a

⁴⁴ This apocryphal correspondence was edited by C. W. Barlow in *Epistolae Senecae ad Paulum et Pauli ad Senecam 'quae vocantur'*.

hostile pagan environment, [early Christian thinkers] frequently felt the need to make explicit their attitudes toward the relationship, or lack of relationship, that they saw between Stoicism and Christianity. (II:3)

According to Colish, this conversation between Stoicism and Christianity continued even after the church became institutionalized in the late empire, since theologians could use Stoic doctrine in various ways. Where they observed heretical or schismatic threats to orthodoxy, theologians could “characterize their opponents as having fallen into error because of their attachment to Stoicism,” or apply it as a “corrective” to positions they wished to refute (II:3). Tertullian, for example, drew heavily upon Stoic philosophy in his writings, where he was equally likely to “criticize them in one context, praise them in another, and Christianize them in the third” (II:14).

Among the avenues, which Stoicism followed into the Christian Middle Ages, the most comprehensive and significant is in the works of St. Augustine. Colish argues that Stoic philosophy is ubiquitous throughout the works of Augustine; in some areas he uses it inconsistently (II:153-69), and in others Stoicism simply indicates the development of his Christian philosophy (II:212-33). In five areas, however, he uses Stoicism with relative consistency, including epistemology, rhetoric, language and logic, physics, and ethics. Augustine’s use of Stoic rhetoric is quite minimal, and his departures from Ciceronian style, Colish argues, are attributable both to Stoicism and Christianity (II:179-81). His use of physics is mixed. He, of course, rejects the Stoic cosmic cycle and the corporeality of god, although Stoic notions about human nature as a reflection of divine rationality are amenable to his doctrines (198-207). Augustine also accepted Stoic ideas regarding the passions and the location of virtue in the soul, though he rejected a good deal of the remainder of their ethical doctrines (207-212). Perhaps the most influential areas of Stoic doctrine in Augustine are in epistemology and language. Augustine made good use of the Stoic ideas about sensory perception as an interaction between the

individual's pneuma and that of the observed object within a material plenum, though he did not specifically recognize the contributions of Stoicism to his thought in this regard (Colish 170). Finally, his preservation of the Stoic distinction between word and meaning is foundational to his own theories of language and logic (190-98).

Historians have long recognized how influential Stoicism was in England, particularly during the Puritan revolution. Reid Barbour, whose *English Epicures and Stoics* examines the influence of Stoicism in Renaissance English culture, argues that early Stuart culture is diacritically obsessed with the Stoics and Epicureans, apart from and in relation to one another; that the Stoics and Epicureans afford early Stuart readers and writers with the most impressive yet vexatious answers to many of their most urgent political and religious questions; and that given the complexity with which the philosophies have been transmitted, the cultural brokers of early Stuart England are forced to wrestle with the paradox by which the friendly philosophy becomes the enemy, and the enemy the friend. (2-3)

Barbour argues that Stoic philosophy contributed to English culture in a variety of ways. While it has primarily been seen as a source of moral philosophy, it also contributed to the formation of early modern natural philosophy (4), and found its expression in political and religious treatises, and even in the drama of the times. Audrey Chew examines the ubiquity of the Stoic influence on the art literature of Renaissance and early modern England. Many "writers were likely to have absorbed Stoic ideas unconsciously from a multiplicity of sources, including their favorite Roman popular writers, many of whom subscribed to a moderate or diluted Stoic philosophy of life" (79). She argues, however, that there were many varieties of Stoicism, some more pure than others, some more compatible with Christianity than with paganism.

Justus Lipsius and the Recovery of Stoic Philosophy

The most direct recovery of Stoic philosophy during the Renaissance was in the work of Flemish humanist Justus Lipsius, who edited editions of Tacitus and Seneca.⁴⁵ Although Lipsius is primarily recognized as a philologist and literary critic,⁴⁶ his translations of Stoic documents constituted the most substantial such effort until Arnim compiled *Stoicorum veterum fragmentum* in 1905. According to his biographer, Jason Saunders, Lipsius's aim was to trace the history of Stoicism and compare it to Christian doctrine, as found in the Bible and in theological works of the Church fathers (xiv). Saunders attributes Lipsius's interest in Stoicism to his anxieties about the wars that ravaged Europe during the late sixteenth century, claiming that he wrote the first of his Stoic treatises, *De constantia libri duo* (1584) "from his real need for support during the sufferings of the wars" (22). *De constantia* was an introduction to Stoic moral philosophy that focused on explicating Stoic definitions of concepts such as free will, providence, justice, and fate (23). Lipsius relied primarily on the works of Seneca, Epictetus, and, occasionally, Cicero. *Politicorum, sive civilis doctrinae libri sex*, published in 1589, was intended to "illustrat[e] various theories of government and sound political procedure" (27). Sources for *Politicorum* were Aristotle, Tacitus, and Cicero. The *Politicorum* was an incredibly popular and influential work. Originally published in 1588-89 in a Latin edition, it was translated almost immediately into Dutch, French, English, German, and Portuguese, and by 1604, it had also been translated into Italian and Spanish. In addition, new editions of about fifteen hundred books were released annually until about 1618

⁴⁵ For an explication of Lipsius's Stoic philosophy, see Jason Saunders, *Justus Lipsius: The Philosophy of Renaissance Stoicism*; see also M. Morford, *Stoics and Neostoics: Justus Lipsius and the Circle of Reubens*. For a brief discussion of Lipsius and his works, see Anthony Grafton, "Portrait of Justus Lipsius."

⁴⁶ Lipsius is widely recognized as a leader of the sixteenth-century reaction against Ciceronian style. According to Morris Croll, Lipsius was able to build upon the less successful fifteenth-century anti-Ciceronian movement led by Erasmus. See Croll, "'Attic' Prose in the Seventeenth Century."

(Evans 9). In 1604, Lipsius produced two works of Stoic doctrine, *Manductio ad stoicam philosophiam* and its sequel, *Physiologiae stoicorum*. According to Saunders, the *Manductio* is an unsystematic and inferior philosophical analysis of the miscellaneous aspects of Stoic moral doctrines, a historical treatment of Stoic philosophy and its antecedents, and a survey of the Stoic paradoxes. By contrast, the *Physiologiae* was a more carefully argued exposition of Stoic thought, emphasizing Stoic physics (54).

Lipsius's treatment of Stoic theory revived the Stoic study of physics as the fundamental part of philosophy. According to Saunders, Lipsius believed that ethics should be the aim of philosophy and logic the method by which knowledge is achieved, but physics must be the beginning of philosophy (Saunders 119). Lipsius argued that logic, while "useful [for] sharpening the mind and establishing the separation and choice of truth and falsity," loses its meaning when studied "apart from the natural world" (119). Regarding nature as the source of knowledge, Lipsius says,

Does not the subject of natural philosophy have the power of being more sweet [wholesome], honest, useful than other disciplines? Nature opens its whole breast — the heavens, earth, and lower regions; the sky, earth, fire, water, air; everything contained in them, God, the angels, and humankind—and invites one to observe and learn of them. (*Phys. Stoicorum*, 1.2, IV, 835 [translation mine])⁴⁷

Lipsius also equates the study of nature with the study of the divine.

The mind in the body is oppressed, as if enclosed in a prison. Unless contemplation is added, which bids the mind to recover courage from the

⁴⁷ Potestne autem suavius, honestius, utilius isto *Physicorum*? Natura totum sinum suum offert, and panduisupera, media, inferna; caelum, terras, ignem, aquas, aëra; quidquid iis continetur, Deum, Genios, Homines; ad haec spectanda and noscenda invitat.

spectacle of the things of nature, and turns the mind from earthly matters to those divine. (*Phys. Stoicorum*, 1.2 IV, 835[translation mine])⁴⁸

For Lipsius, the eclectic nature of Stoic philosophy was its greatest appeal. He sought in philosophy a solution to the dogmatic conflicts that were tearing Europe apart, seeing adherence to a single philosophy as dangerous and believing that the study of philosophy in general could enhance the “truths” of Christianity (Saunders 218).

Lipsius’s version of Stoicism is clearly not faithful to the original, but is a compromise with his Renaissance Christian perspective. In his attempt to reconcile Stoicism with Christianity Lipsius failed to represent the synthetic and systematic nature of the philosophy, instead relying too heavily on the works of Seneca and Epictetus and ignoring a variety of other sources, particularly those which described technical aspects of Stoic cosmology (Long, “Stoicism in the Philosophical Tradition” 379). Lipsius also distorted the original philosophy by incorporating secondary material from Platonist and Christian writers. Finally, he referred to Christian doctrine as the criterion by which Stoic philosophy should be judged. Thus, a number of significant aspects of Stoic philosophy, particularly of physics, fell by the wayside (379-80).⁴⁹ The fact that Lipsius’s representation of Stoicism was not completely true to the original philosophy does not negate its influence, however. It was the compatibility of the received version of Stoicism with Christianity that made it attractive as an alternative to the Augustine strain of Renaissance humanism.

⁴⁸ Ille in hoc corpore, velut in custodia clausus, premitur; nisi Contemplatio accessit; que illum respirare rerum Natura spectacula iubeat; et a terrenis dimittet ad divina.

⁴⁹ Long, whose interest is ancient Stoicism, is perhaps too harsh in his criticism of Lipsius’s representation of Stoicism. It is certainly the case that Lipsius was more concerned with moral philosophy than with physics and that he deferred to Christian doctrine whenever he found conflicts between it and Stoicism. However, there were fewer texts extant that pertained to Stoic physics, and Lipsius did, at least, make available a version of Seneca’s understanding of Stoic physics to his Renaissance contemporaries.

Francis Bacon and Stoic Humanism

Twentieth century scholars have often described Francis Bacon as an anti-humanist. Anthony Grafton, for example, says that Bacon treated humanism as “a fatal disease of learning” (“New Science” 205).⁵⁰ Generally, such critique is founded on Bacon’s criticism of the copious yet empty rhetoric of some of his contemporaries. Brian Vickers argues at length that Bacon’s

critique is directed against the excessive imitation of Cicero’s Latin style and forms part of a well-documented episode within humanism . . . culminating in the whole series of literary quarrels sparked off by Erasmus’s *Ciceronianus*. (“The Myth of Francis Bacon’s ‘Anti-Humanism’” 140)

Vickers concludes that any reading of Bacon’s theories regarding rhetoric and language that places him outside the humanist tradition does so only by narrowly defining Renaissance rhetoric to include only those theories that descended from Quintilian and Cicero.⁵¹ Certainly, Bacon fits more neatly within the framework of Stoic humanism than he does within the Augustinian tradition.⁵² Bacon’s *Advancement of Learning*, in which he argues for a complete reform of education to create a system that is organized according to the structure of the human mind and aimed at exploring and explicating the natural world, is the clearest example of how he melds elements of Stoic philosophy within a Renaissance humanist framework.

⁵⁰ See Brian Vickers, “The Myth of Francis Bacon’s Anti-Humanism” for a more extensive summary of the literature regarding Bacon’s purported antipathy to humanism.

⁵¹ Nothing here should be construed to suggest that Vickers places Bacon within the Stoic tradition. In fact, places Bacon within the line of Aristotelian rhetoric and rejects quite strenuously arguments for Bacon’s adoption of the Stoic style. See Vickers’ *Francis Bacon and Renaissance Prose*.

⁵² While Vickers recognizes Bacon’s plainer style, he rejects the notion that his style is Stoic.

English Humanism and the Education of Francis Bacon

Nowhere was the civic aspect of humanism more fully developed than in England.⁵³ The early English humanists—including Thomas More, Richard Fox, who founded Corpus Christi College at Oxford, John Colet, dean of St. Paul's Cathedral and founder of the boys' grammar school there, and Roger Ascham, tutor to Queen Elizabeth and author of *The Scholemaster* — were all committed to promoting a classical education, including training in rhetoric, even at the grammar school level,⁵⁴ and competency in both Greek and Latin for more advanced students. For the English humanists, however, education was not intended to lead to a cloistered life (the *vita contemplativa*), but to be used in an active life of service to the monarch and commonwealth. A number of famous humanist texts, notably Thomas More's *Utopia* and Thomas Elyot's *The Boke Named the Governour*, were concerned primarily with offering advice for the sound government of the commonwealth. *Utopia* described an idealized form of government in which all citizens contributed to the good of the society, while Elyot's text delineated the most desirable education and characteristics of the ideal sovereign. English humanism did not limit education to male aristocrats. Ascham describes, for example, the excellencies of character of Elizabeth I and Lady Jane Gray, both of whom were classically educated in the humanist tradition. Francis Bacon's mother also received an extensive humanist education and it was she who chose her sons' tutor and oversaw their formal education (Jardine and Stewart 32).

Francis Bacon was born in 1561, younger son of Nicholas Bacon, Lord-Keeper of the Great Seal to Queen Elizabeth I, and Ann Cooke, his second wife. Nicholas Bacon, a

⁵³ This is not to suggest that English civic humanism went further than that described in the Italian city-state by Baron. My point is that the establishment of educational institutions to prepare individuals for an active life of service to the commonwealth was the primary interest of the British humanists.

⁵⁴ Laurence Green has argued that the training in the use of tropes and figures in Lily's Latin *Grammar*, widely used in grammar school education from the fifteenth century onward, provided a basic education in rhetoric even for students who did not proceed to a university education. See "Grammatica movet".

sheep reeve's son, was educated as a scholarship student at Cambridge, became a member of the aristocratic literati of the country, and advanced to one of the highest positions in the land. That Nicholas recognized the role education played in his advancement is demonstrated by a number of generous gifts to educational institutions throughout his life (Jardine and Stewart 24-25). Bacon was immersed in Renaissance humanist culture throughout his life.⁵⁵ As a child, Francis Bacon was introduced at court by his father, and is reputed by his biographer Rawley to have demonstrated a rhetorical precocity that made him a favorite with the Queen, who called him "the young Lord Keeper" (*PW* 1). Bacon's education began at home, where he was first tutored by John Walsall, a scholar from Christ Church, Oxford, who was selected by Ann Bacon as much for his radical Protestantism as for his humanist erudition (Heltzell; see also Jardine and Stewart 35). In 1573, twelve-year old Francis accompanied his older brother Anthony to Trinity College, Cambridge, where they spent most of the next three years. While at Oxford, the brothers' education was directly supervised by John Whitgift, master of Trinity, who designed for them a typically humanist course of study that included the works of Livy, Caesar, Sallust, Demosthenes' *Orations*, Homer's *Iliad*, Cicero's *Complete Works*, and the rhetorical handbook then believed to be authored by Cicero, the *Ad Herrenium*. They studied Plato and Aristotle, along with Hermogenes and Xenophon in an edition with Greek and Latin on facing pages. They also would have studied Greek grammar and logic (35). It was during this time, according to Rawley, that Bacon "first fell into the dislike of the philosophy of Aristotle; nor for the worthlessness of the author, to whom he would ever ascribe all high attributes, but for the uselessness of the way;

⁵⁵ Francis Bacon did not leave an autobiography, though his life is well documented through his letters and many other texts. The first of many biographies was published in 1657 by William Rawley, the first editor of Bacon's works. Subsequent biographies include Edwin Abbott's *Bacon and Essex: A Sketch of Bacon's Earlier Life* (1877) and *Francis Bacon: An Account of his Life and Work* (1885); Charles Williams's *Bacon* (1933); Bryan Bevan's *The Real Francis Bacon* (1960); Catherine Drinker Bowen's *Francis Bacon: The Temper of a Man* (1963); Anthony Quinton's *Francis Bacon* (1980); and Lisa Jardine and Alan Stewart's *Hostage to Fortune: The Troubled Life of Francis Bacon* (1998).

being a philosophy (as his lordship used to say) only strong for disputations and contentions, but barren of the production of works for the benefit of the life of man” (2).⁵⁶ According to Rawley, during his tenure at Cambridge, Bacon “was observed to be more than an ordinary proficient in the several arts and sciences” (2); it is clear from the eloquence that characterized his discourse throughout his life that he learned much from his early training in the liberal arts. It should not be assumed, however, that Francis Bacon was devoted solely to the academic life. Jardine and Stewart paint a portrait of Bacon and his brother Anthony at Cambridge as young men who saw this time as an opportunity for “gentlemanly grooming,” during which they gathered the learning and accouterments that allowed them to fashion themselves as the future courtiers that their heritage entitled them to be (36).

In 1576, shortly after Francis was admitted to Gray’s Inn for the study of law, his father arranged for him to become a member of the household of Sir Amyas Paulet, ambassador to France. Nicholas Bacon’s plan was for Francis to augment his legal studies by studying Roman law as it was practiced in France (Jardine and Stewart 39). Francis Bacon was to look back on this period as one of the most important in his life. In addition to learning Roman law, he met new people and learned the manners and habits required of an ambassador to the more sophisticated courts of Europe (39-40). He was also exposed to new ideas and new ways of thinking.⁵⁷ During his stay in France, in order to supplement the money supplied by his father, Francis undertook some spy missions on behalf of the crown. He also became acquainted with Thomas Phillips, Sir Francis Walsingham’s master cryptographer, from whom he first learned codes and cyphers, an

⁵⁶ Jardine and Stewart suggest that, brilliant as the young Bacon was, such “philosophical precocity” may be some of Bacon’s own revisionism (35).

⁵⁷ Paolo Rossi suggests that Francis Bacon’s philosophy regarding technology was formed in part by his exposure to the ideas of Bernard Palissy, a French potter known for his experiments in ceramics (*From Magic to Science* 8-9). Markku Peltonen indicates that Bacon may have attended Palissy’s public lectures during his time in Paris (3).

interest that Bacon continued throughout his life and that informed his representation of nature as a perplexing but ultimately decipherable mystery (Jardine and Stewart 49-57). In February, 1579, Nicholas Bacon died unexpectedly, before he was able to provide an estate for Francis. Within a month, Francis returned home to begin a much different kind of life.

On his return home from Europe, Bacon began his study of the law at Gray's Inn and the long struggle to carve out a place for himself in the British court. Two years later, Bacon got his first taste of political office when he was returned to Parliament for Bossiny, Cornwall, and he continued to be active in the House of Commons for many years. In 1582, he was admitted to the bar as an utter barrister and progressed through the ranks for the next decade. Throughout this time, as Bacon became more involved in the political and legal life of England, he continued to seek the preferment that he finally found from Elizabeth's successor, James I. In 1603, he was knighted, in 1604 appointed Learned Council to the king, and in 1607, having taken a key role in the negotiations between Parliament and the King for unification of the two kingdoms, he was rewarded with the post of Solicitor-General which he had sought for many years. As he continued to curry favor with James and his intimates, Bacon's fortunes rose accordingly. Between 1612 and 1618, he was appointed to the posts of Attorney General, Privy Councilor, Lord Keeper, and Lord Chancellor. In 1618, Bacon was created Baron Verulam and, in January 1621, he was created Viscount St. Albans. This exalted status did not last long, however; by March of the same year, Francis Bacon was charged with and convicted of accepting bribes.

Although Bacon never again participated to any significant degree in the public life of England, he made perhaps his most lasting contribution during the last five years of his life. As was the case with many humanists, Bacon longed for the contemplative life

even as he lived the active life at court and in Parliament.⁵⁸ During the relative seclusion that resulted from his disgrace, he produced many of the philosophical texts for which he is remembered today. His biographer, Rawley, gives the following account of the works Bacon produced during this period:⁵⁹

The last five years of his life, being withdrawn from civil affairs and from active life, he employed wholly in contemplation and studies—a thing whereof his lordship would often speak during his active life, as if he affected to die in the shadow and not in the light; which also may be found in several passages of his works. In which time he composed the greatest part of his books and writings, both in English and Latin. (*PW* 4)

Jardine and Stewart suggest that Rawley's account of Bacon's final years and his gift to posterity is a continuation of Bacon's own campaign to rehabilitate his image (473-476). Whatever his or his close associates' intentions, there is no doubt that these texts, along with the *Novum Organum* and *The Great Instauration*, are the foundation for the image of Francis Bacon that has persisted into the twenty-first century.

As in his lifetime, Bacon remains a difficult figure to evaluate. His life, however, exemplifies the tension between the *vita activa* and *vita contemplativa* that is characteristic of the humanist project. Whether or not his motivations were selfish, there is no question that he dedicated all his energies to the life of public service that was central to the humanist tradition. This impulse toward service carried over into both his political and philosophical writings. Although Francis Bacon's political writings were,

⁵⁸ William Bouwsma in *The Culture of Renaissance Humanism*, examines the contradictory impulses toward the *vita activa* and *vita contemplativa* that characterize the humanist experience.

⁵⁹ Rawley goes on to enumerate the list of works Bacon completed, many of which were published posthumously. See Graham Rees' Introduction to Vol. 6 of *The Oxford Francis Bacon* for a discussion of when the works Rawley enumerates were actually written. Rees suggests that most of these works were, in actuality, already in progress as many as ten years before Bacon's trial and subsequent "withdrawal" from civic life.

perhaps, the most influential of his writings during his lifetime, they have proved less durable over time than his *Essays* and his philosophical works on education and natural philosophy. As a humanist, Bacon was concerned with reforming the educational system of his times, and he sought to resolve some of the inherent conflicts he recognized within the humanist project. He describes his project William Burghley thus:

I have taken all knowledge as my province; and if I could purge it of two sorts of rovers, whereof the one with frivolous disputations, confutations, and verbosities, the other with blind experiments and auricular traditions and impostures, hath committed so many spoils, I hope I should bring in industrious observations, grounded conclusions, and profitable inventions and discoveries; the best state of that province. (qtd. in Jardine and Stuart 133-34)

Such confidence in his ability is, perhaps, no great boast for one who, according to his biographer Rawley, had decided at an early age to reform educational practices that had been in place since the time of Aristotle.

Bacon's Active Science

Twentieth-century opinions of Francis Bacon's status as a progenitor of modern science are mixed. Whether he is seen as a buffoon or as a visionary, however, such retrospective views are based on criteria of modern science. One might argue, following Thomas Kuhn's model, that Bacon's views are no longer scientific because subsequent paradigm shifts have made his understanding of science incommensurable with our contemporary understanding of science.⁶⁰ Conversely, however, contemporary views of

⁶⁰ Kuhn, a historian of science, introduced the concept of the "paradigm shift," a model that describes the process through which changes in scientific thought and practice occur. Paradigm shifts begin in the course of "normal science," i.e. the routine testing of the limits of currently accepted theory, with the observations of anomalous events that contradict a prevailing scientific theory. As these anomalous observations accumulate, scientists begin to advance new theories to explain them. Generally, however, it is not until the

science are incommensurable with sixteenth-century epistemology, so one cannot so easily dismiss the appropriateness of Bacon's limited practice of natural philosophy in his own age.

There is also considerable disagreement over the relationship between Bacon's new philosophy to humanism. Grafton, for example, cites a commonly held view that at a time when humanism was already being "questioned and subverted," Bacon "inserted dynamite and lit the fuse" ("The New Science and the Traditions of Humanism" 205). Assertions that Bacon intended either to destroy humanism or to establish science are both problematic since humanism was hardly a coherent institution and "science" as an identifiable cultural construct had yet to come into being. Bacon recognized a number of "deficiencies" in the educational and intellectual practices of his day, deficiencies that he detailed for the first time in his 1605 publication of *The Advancement of Learning*. Not all these deficiencies were part of the humanist tradition; some of them were associated with scholasticism and with the Protestant reformation. Among the problems he identified were the conflict between the *vita activa* and the *vita contemplativa* and a concern with words at the expense of matter. The way to remedy these problems, according to Bacon, was "to commence a total reconstruction of sciences, arts, and all human knowledge, raised upon the proper foundations" (Proem to the Great Instauration, *PW* 241). He argues for nature as the foundation for the edifice of learning he proposes.

The belief that Bacon's program is anti-humanistic is a result of a failure to consider the totality of his debt to ancient philosophies, as well as his commitment to humanist values. Graham Rees argues that Bacon drew on a variety of ancient doctrines in formulating his view of nature and natural philosophy, including "atomist and

accretion of anomalies is so great that they can no longer be ignored that a paradigm shift occurs, and a new theory becomes generally accepted. In Kuhn's view, then, the process of scientific revolutions is much more evolutionary than catastrophic. They are, however, revolutionary to the extent that they are inevitable and irrevocable; after the paradigm shift occurs, the old paradigm is incommensurable with what it replaced.

Aristotelian natural philosophies, Copernicanism, Galileian observational astronomy, the work of Paracelsus, of William Gilbert, Telesio, Patrizi, and others besides” (“Bacon’s Speculative Philosophy” xxxvii). According to Rees, Bacon’s natural philosophy had a doubleness that has not been sufficiently explored. He argues that it appears “[o]n the one hand . . . as a programme for constructing a body of scientific knowledge that would yield practical benefits to release the human race from material privation. On the other hand it appears as a strange corpus of theory, a speculative recreation, an attempt to picture the knowledge that might be produced once the programme was implemented” (xxxvi). This is reflected in the Plan of the Great Instauration, for example, in which Bacon’s descriptions of the first three parts of the work clearly indicate his intent to establish such a program while the latter parts suggest a more speculative activity. If Rees’s description of the doubleness of Bacon’s project is taken at face value, there seems to be little space for Stoic influence, since the programmatic aspects are too materialistic for Stoic sensibilities, and the speculative sections are informed by the mish-mash of theories that Rees has identified. However, Rees’ description of Bacon’s program, i.e., “constructing a body of scientific knowledge that would yield practical benefits to release the human race from material privation,” does not reflect fully the degree to which Bacon saw his Instauration as transformative of the intellect and spirit of humankind, as well as improving its material situation. For the humanist, intellectual arts were not mere sets of strategies, but were intended to be internalized and practiced. In the same way that eloquence was not merely the product of art, but reflected the character of the speaker as well, Bacon would have expected his method to have a transformational effect on its practitioner and for that to be reflected in behavior and demeanor. Thus, the benefits achieved through the methodical study of nature would not have been merely intellectual, but material and spiritual as well. The philosophy of Stoicism served as a model for this sort of transformational and normative practice. Bacon’s understanding of

nature as a rational and discernible creation owes much to the ideas of the later Stoics, especially those of Seneca. In particular, Bacon relied on Stoicism to bolster his assertions that nature was divinely created and yet an orderly system whose mysteries could be penetrated by rational humans. Bacon's understanding of nature as a source of a normative standard may also be traced to the Stoics.

Bacon recognized that many of the fundamental conflicts of the Renaissance were epistemological. Humanism, operating in the realm of the contingent, relied upon a standard of practical wisdom; religion was legitimated by divine revelation; and the new philosophy yielded theoretical knowledge that was legitimated observationally or methodologically. Bacon argued for nature as a legitimate source for theoretical knowledge, and in doing so, he proposed a new ethical standard for the practical wisdom which humanists valued so highly. He also articulated a justification for technology as productive knowledge and broadened the range of methodologies by which human beings interrogated their world. Whereas the humanists had depended almost exclusively upon rhetoric as an architectonic art, Bacon developed a "new kind of logic" for the new kind of intellectual activity he proposed. However, despite his claims regarding the novelty of his new philosophy, Bacon's reformation is clearly in the humanist mold, given its emphasis on education, civic activism, and the rhetorical nature of his efforts. His earliest attempts in this regard were aimed at reforming the educational system, replacing both the stultified Aristotelianism of the Middle Ages and the copious rhetoric of the Renaissance with a "new" philosophy inspired, in part, by ideas from ancient texts recovered by his humanist predecessors. Moreover, it seems clear that this reconstruction was founded upon the humanistic desire to improve the human condition. Despite his concern regarding the inherent inability for words adequately to represent things, his program was greatly influenced by humanist rhetoric, and his Great Instauration was really little more than an extended argument, which begins from the premise that nature

is the appropriate foundation for knowledge. Unlike his contemporary Peter Ramus, who showed great contempt for rhetoric, Bacon recognized the importance of eloquence in the public arena. The centrality of language to his project is perhaps best demonstrated in his emphasis on the development of new discursive forms that he claimed were better suited to philosophical endeavors.

While Bacon's new philosophy in some respects seems to reject humanist practices and to propose a new, methodical intellectual enterprise that somewhat resembles modern science, it is grounded in humanist values and practices. Bacon sought, through his Great Instauration, to unite the active and contemplative ways of life and to produce a certain kind of individual who could carry out this program of improvement. Thus, he united practical wisdom with theoretical knowledge and, rather than replacing Aristotelian teleology with ontology, conflated "ought" with "is". This collapsing of "ought" with "is" is compatible with the Stoic view of nature as rational and normative. Bacon did not stop, however, with uniting these two epistemological practices, but returned to the Aristotelian typology, which posits a third branch of wisdom, productive knowledge. Unlike Aristotle, however, Bacon had to deal with a theological tradition that was suspect of notions that humans could *command* nature. The philosophy of the ancient Stoics provided him with a set of concepts and commonplaces that he deployed in an extended argument for a new epistemological system. Stoicism provided a model for a synthetic philosophy that integrated all these aspects of knowledge in a way that could accommodate theological objections and advance the humanistic desire for improving the lot of humankind.

CHAPTER TWO

FINDING NATURE'S ORDER:

STOIC INFLUENCES IN BACON'S NATURAL PHILOSOPHY

Nature is an artistic fire going on its way to create.

—Diogenes Laertius⁶¹

Philosophy, they say, is like an animal, Logic corresponding to the bones and sinews, Ethics to the fleshy parts, Physics to the soul. Another simile they use is that of an egg: the shell is Logic, next comes the white, Ethics, and the yolk in the center is Physics. Or again, they liken Philosophy to a fertile field. Logic being the encircling fence, Ethics the crop, Physics the soul or the trees. Or, again, a city strongly walled and governed by reason.

—Diogenes Laertius⁶²

Now what the sciences stand in need of is a form of induction which shall analyse experience and take it to pieces, and by a due process of exclusion and rejection lead to an inevitable conclusion. And if that ordinary mode of judgment practiced by the logicians was so laborious, and found exercise for such great wits, how much more labour must we be prepared to bestow upon this other, which is extracted not merely out of the depths of the mind, but out of the very bowels of nature.

—Francis Bacon⁶³

⁶¹ Diogenes' description of the Stoic concept of nature appears in *Lives of the Philosophers*, vii 156.

⁶² Diogenes' description of the relationship between the elements of Stoic philosophy appears in *Lives of the Philosophers* vii 39.

It may also be asked . . . whether I speak of natural philosophy only, or whether I mean that the other sciences, logic, ethics, and politics, should be carried on by this method. Now I certainly mean that what I have said to be understood of them all; and as the common logic, which governs by the syllogism, extends not only to natural but to all sciences; so does mine also, which proceeds by induction, embrace everything. For I form a history and tables of discovery for anger, fear, shame, and the like; for matters political; and again for the mental operations of memory, composition and division, judgment and the rest; not less than for heat and cold, or light or vegetation, or the like. But nevertheless since my method of interpretation, after the history has been prepared and duly arranged, regards not the working and discourse of the mind only (as the common logic does) but the nature of things also, I supply the mind with such rules and guidance that it may in every case apply itself aptly to the nature of things.

—Francis Bacon⁶⁴

The key to the development of modern science is a mechanistic view of nature as a regular system the rules of which may be perceived and exploited by human beings. Francis Bacon's natural philosophy, while not completely consistent with modern science, also presents nature as orderly and comprehensible to human beings. This view is very different from that which preceded it, i.e., nature as a mysterious system responsive to the commands of God and the actions of human beings. Any history of

⁶³ "The Plan of the Work," *PW* 251.

⁶⁴ *NO* I.cxxvii

science ought to take into account the means by which this transformation occurred. The standard narrative of the scientific revolution suggests that a revitalizing Platonism, with its emphasis on abstract mathematical concepts, triumphed over a stultified Aristotelian teleological philosophy.⁶⁵ However, modern science is not merely abstract; rather it is also empirical and experimental, to the extent that it derives abstract principles from the experimental testing of hypotheses based upon empirical observations. Platonism certainly provided no examples for this kind of thinking or practice. Despite the usefulness of Platonist mathematics for disciplines such as theoretical physics, it is unlikely that Platonism alone could have sparked changes as far-reaching as those that constitute the scientific revolution. First, the Platonists viewed the physical world as an inferior reflection of the world of Ideas, so that, while it may ultimately be useful for scientists attempting to describe how Nature works in the abstract, Platonism is not likely to have led Renaissance thinkers to engage in empirical investigations of nature, the corrupt physical manifestation of the Ideal. Thus, while this Platonizing narrative may partially satisfy an internalist history of science, it does not fully explain even the internal changes in natural philosophy, much less how the larger culture came to accept such a radical change in world view. To uncover the roots of the scientific revolution, it is worthwhile examining the activities and ideas of Renaissance humanists, who recovered a wide variety of ancient philosophical texts and are responsible for inserting new ideas into the culture of the late Renaissance. A number of these other philosophical systems encompassed views of nature that were more compatible with both the then-current natural philosophy and Christian theology.

The intellectual life of the ancient world was much more diverse than the modernist Platonism-Aristotelianism dichotomy would suggest. As a result of their

⁶⁵ Alexandre Koyré's "hypothetico-deductive" model of Galilean science is an example of this kind of narrative.

efforts to recover ancient texts, sixteenth- and seventeenth-century European humanists were fully aware of philosophies both more ancient and more recent than those of Plato and Aristotle. Available to them through the works of ancient biographers and doxographers were fragments from the most ancient Greek philosophers, such as Thales and Anaxagoras, the Pythagoreans, and the early Greek atomists such as Democritus. It was a rich heritage, only part of which included a mathematical view of the universe. In addition to these more ancient texts, humanists also recovered the works of philosophers who were contemporaries of Plato and Aristotle, as well as those of their successors in their respective schools. Texts that were not extant were often recounted in the other texts. Also available to Renaissance thinkers were texts from philosophical schools that evolved from these classical philosophies, such as the various schools of skepticism—the Academics and the more radical Pyrrhonists — as well as the materialist philosophies of the Epicureans and Stoics. In addition to these ancient texts, records of more recent attempts to understand and manipulate nature contributed to the intellectual background of the scientific revolution. These include a brief interest in natural philosophy during the late Middle Ages⁶⁶ and the more durable interest in alchemy and astrology.⁶⁷ Finally, technological innovations in a number of fields, from medicine to optics to ceramics, contributed to this eclectic intellectual mix.

Francis Bacon's philosophy, which he constructed from both ancient philosophies and more recent practices, demonstrates the eclecticism that characterized the Renaissance philosophical landscape. In his study of Bacon's philosophy, Stephen Gaukroger examines the degree to which Bacon's eclecticism was characteristic of the philosophical landscape of seventeenth-century England. According to Gaukroger, this

⁶⁶ See Butterfield, *The Origins of Science 1300-1800*.

⁶⁷ See Frances Yates's work on the Hermetic corpus in *Giordano Bruno and the Hermetic Tradition*, *The Rosicrucian Enlightenment*, and *Occult Philosophy in the Elizabethan Age*. Paolo Rossi examines Francis Bacon's interest in alchemical tradition in *From Magic to Science*.

eclecticism was not merely a result of the variety of sources recovered by the humanists, but reflected the character of the recovered philosophies themselves:

Eclecticism was a feature of philosophy in the late Hellenistic, Roman, and early medieval periods. Cicero, one of the principal sources of the moral philosophy of antiquity, presented this moral philosophy in a completely eclectic way, and Renaissance humanists from Petrarch onwards took over this eclecticism as part [of] their approach to moral philosophy. More generally, Roman thought, in which Stoicism was particularly important, was saturated with various forms of eclecticism and syncretism, and Stoic, Aristotelian, and Platonist doctrines were readily assimilated. (28-9)

As far as the practice of experimental natural philosophy in the Renaissance is concerned, Epicureanism,⁶⁸ which adopted a material view of the universe and attempted to explain events in the physical world without reference to any divine intervention, may have had more to contribute to the Renaissance resurrection of natural philosophy as the immediate epistemological antecedent of modern science. But Epicureanism, to the degree that it was seen to promote hedonism and reject the divine, was certainly anathema to Christian Europe. However, Stoic philosophy, which had a much greater influence on Renaissance and early modern society as a whole, is more likely to have helped prepare the late Renaissance or early modern mind for the epistemological shift that has been called the

⁶⁸ Epicureanism, which drew upon ancient Greek atomistic philosophy, is perhaps a more likely antecedent for the practice of early modern science and for some of Bacon's ideas. For a concise discussion of this school, see the chapter, "Epicureanism," in E. E. Long's *Hellenistic Philosophy: Stoics, Epicureans, Sceptics*. See Reid Barbour's "Remarkable Ingratitude: Bacon, Prometheus, Democritus" for a discussion of Bacon's borrowings from atomistic philosophies. See also Fulton Anderson, *The Philosophy of Francis Bacon*, for a discussion of Bacon's appreciation for the Greek atomists. For a discussion of Gassendi's struggles to "Christianize" Epicurean atomism, see Margaret J. Osler, "Renaissance Humanism, Lingering Aristotelianism, and the New Natural Philosophy: Gassendi on Final Causes." Osler argues that Epicureanism's conceptualization of the atom, though incompatible with Renaissance religion, was more compatible with the new natural philosophy than Aristotelian teleology (193-195).

“scientific revolution.” This is not to say that Bacon himself, who often protested quite vigorously against various Stoic doctrines and against those of his contemporaries who had more openly adopted Stoic moral philosophy, was a Stoic. Nor is it to suggest that Bacon’s natural philosophy replicates Stoic physics, of which little is actually known. Rather, I argue that Bacon incorporates certain aspects of Stoic philosophy, particularly that he uses Stoic ideas as commonplaces in his argument in favor of natural philosophy and that Stoic epistemology informs his own new philosophical method. Stoicism also provided a model for integrating natural philosophy with other moral and ethical philosophy and provided a model for the sort of synthetic intellectual system Bacon wanted to build. Finally, because for the Stoics nature fulfilled a normative function, i.e., to behave in accordance with nature was the highest good, it served as a model for the study of nature as equivalent to the study of divine revelation.

The Stoic View of Nature

Stoic philosophy is built upon the central principal that the whole of the universe is the embodiment of reason, which they call *logos*, and that human beings are governed by and share in the immanent logos of the universe. It is this intersection between the natural world and reason that accounts for the extraordinary coherence of Stoic philosophy. Physics, the study of nature or *physis*, is the study of the natural (rational) order of the universe; logic trains human beings to interpret immanent logos; ethics is the practical application of natural reason, or, to be precise, the attempt to conform to natural order. Central to the Stoic enterprise are two key concepts: reason (*logos*) and nature (*physis*).

Logos

The term *logos* is a contested term that carried different meanings within the

various schools of Greek and Hellenistic philosophy. Generally it denotes a variety of linguistic concepts, including the structure of argumentation, discourse, and logic or reason.⁶⁹ Throughout antiquity, because the Greeks recognized language as the source of humans' superiority over other creatures, *logos* always evoked the notion of power or force: the power to persuade, or even, in the rhetoric of the early Sophists, to remake our concept of the world.⁷⁰ The Stoic philosophers, however, endowed the term with extraordinary generative power because they believed that *logos* was not merely a way for human beings to conceptualize the world, but the force that was responsible for the creation of the world. The Stoics believed that the universe (*kosmos*) was made up of two elements, "that which acts and that which is acted upon. That which is acted upon is unqualified substance, i.e. matter; that which acts is the reason [*logos*] in it, i.e. god. For this, since it is everlasting, constructs every single thing throughout all matter" (Diogenes Laertius 7.134). For the Stoics, *logos* is "intelligent, a designing fire [*pur technikon*] which methodically proceeds towards creation of the world, and encompasses all the seminal principles according to which everything comes about" (Aetius 1.7.33 [*HP* 46A]). *Logos* is the seminal force in the cosmos. In the Stoic cosmology narrative, *logos*, which is synonymous with "god," in the form of a creative fire, initiates a cycle of generation which lasts several thousand years before being consumed in a conflagration initiated by the sun:

God, intelligence, fate, and Zeus are all one, and many other names are applied to him. In the beginning all by himself he turned the entire substance through air into water. Just as the sperm is enveloped in the

⁶⁹ See Susan Wells's discussion of the term in the *Encyclopedia of Rhetoric*.

⁷⁰ For the Sophists, the art of rhetoric was the most important art. In *The Sophists*, W.K.C. Guthrie describes Sophistic perceptions of reality: "For Gorgias persuasion was sovereign because there was no truth over and above what man could be persuaded to believe and Protagoras was already teaching his pupils that on every subject opposed positions could be argued with equal validity, that what a man believed was true for him, and no man could contradict another in opposing a true view to a false" (211-12).

seminal fluid, so god, who is the seminal principle of the world, stays behind as such in the moisture, making matter serviceable to himself for the successive stages of creation. (Diogenes Laertius 7.135-67)

The two primary principles, i.e., logos and matter, are indestructible and infinite, whereas elements, i.e. earth, air, fire, and water, which combine to create everything in the world, are finite and “pass away at the conflagration” (Diogenes Laertius 7.134). Following the conflagration, “nature comes to stop for a while” and the god “reposes in himself given over to his thoughts” (Seneca, *Letters* 9.16), after which the cycle repeats itself. In representing logos as a “*designing* fire,” [emphasis added] the Stoics emphasized the intelligence and craftsmanship of the seminal principle in the cosmos.

Another term for the immanent, activating force in the cosmos is *pneuma*,⁷¹ or breath, a term which the Stoics preferred to use in discussions of material aspects of nature. They use *pneuma*, for example, to explain the diversity of life in the cosmos. Diogenes Laertius says that, according to the Stoics, “[t]he world is directed by intelligence and providence, . . . since intelligence pervades every part of it, just like the soul in us. But it pervades some parts to a greater extent and others to a lesser degree” (Diogenes Laertius 7.138-9). The Stoics make distinctions between different levels, or concentrations, of *pneuma* as it inhabits animals, plants, and inanimate objects:

Intelligence . . . has many powers, the tenor kind, the physical, the psychic, the rational, the calculative . . . Tenor is also shared by lifeless things, stones and logs, and in our bones, which resemble stones, also participate in it. Physique also extends to plants, and in us there are things like plants—nails and hair. Physique is tenor in actual motion. Soul is Physique

⁷¹ The Stoics used a number of terms to designate the same thing, i.e., the seminal, rational, motivating force of the cosmos. *Logos*, *pneuma*, *pur technikon* all refer to the same force.

which has also acquired impression and impulse. This is also shared by irrational animals. (Philo, *Allegories of the laws* 2.22-3)

The Stoics make a distinction between inanimate objects that have only the tenor of the creative force and cannot act but must be acted upon and things that “have the cause of movement in themselves, that are ‘ensouled’ and able to receive impressions which lead to impulses” (Origen, *On principles* 3.1.2-3). The soul of animals had seven parts, including the five senses, the ability to reproduce, and utterance. Rational animals had, in addition, a commanding faculty (*hegemon*) that was called reason (Aetius 4.21.1-4). For the Stoics, the cosmos, itself ensouled by reason/god/pneuma was in effect a living being— “[The Stoics] say that god is an animal which is immortal and rational or intelligent” (Diogenes Laertius 7.147)—and the human being was seen as a microcosm (Long & Sedley 319).

Stoicism, unlike its philosophical antecedents, did not posit the existence of absolutes or the Platonic concept of the Ideal:

[C]oncepts are neither somethings nor qualified, but figments of the soul which are quasi-somethings and quasi-qualified. These, they say, are what the old philosophers called Ideas. For the Ideas are of the things which are classified under the concepts, such as men, horses, and in general all the animals and other things of which they say that there are Ideas. The Stoic philosophers say that there are no Ideas, and what we ‘participate in’ is the concepts, while what we ‘bear’ is those cases which they call ‘appellatives’. (Stobaeus 1.136, 21-137, 6)

Nor did the Stoics believe in an afterlife. At the end of the regenerative part of the cosmic cycle, when the world was consumed in fire, god, or logos, withdraws into itself:

It will be like the life of Zeus, at the time when the world is dissolved and the gods have been blended together into one, when nature comes to stop

for a while; he reposes in himself given over to his thoughts. The wise man's behaviour is just like this: he retires into himself, and he is with himself. (Seneca, *Letters* 9.16)

Stoicism, then, is not a teleological system, such as those posited by Plato and Aristotle. The end of human existence, indeed of the cosmos itself, is not some future existence, but existence itself.

Nature and Natural Order

The second critical term in Stoic philosophy is "nature" (*physis*), which they use to refer to a cluster of related concepts:

By 'nature' they sometimes mean what sustains the world, and sometimes what makes things on earth grow: nature is a self-moving tenor, which completes and sustains its products in accordance with seminal principles at determinate times, and continues to perform the actions from which they came to light. (Diogenes Laertius 7.148.9)

These two functions do not fully capture the many ways in which the Stoics conceptualized nature. The Stoics commonly used this term in five ways, including "(1) the power or principle which shapes and creates all things; (2) the power or principle which unifies and gives coherence to the world; fiery breath; (3) artistic fire, self-moving and generative; (4) necessity and destiny; (5) God, providence, craftsman, right reason" (Long *Hellenistic Philosophy* 148). While the term 'nature' is often synonymous with logos, it has additional meanings since the term refers not only to the entire cosmos, but also to each part of the cosmos, i.e., the nature of plants is *physis*, the nature of animals is soul, and the nature of rational animals, or human beings, is logos.⁷² Because it is identified with logos, the creative and intelligent force of the universe, the Stoics saw

⁷² See Long's discussion of these natures in *Hellenistic Philosophy* 148.

nature as deterministic and normative and identified this deterministic aspect as fate, “a sequence of causes, that is, an inescapable ordering and interconnection” (*HP* 55J).

Chrysippus, one of the leaders of the Stoa, called fate

a power of breath, carrying out the orderly government of all. . . . [A]nd here and there in other works he expresses a variety of views: ‘Fate is the rationale of the world’, or ‘the rationale of providence’s acts of government in the world’, or ‘the rationale in accordance with which past events have happened, present events are happening, and future events will happen’. (Stobaeus 1.79, 1-12)

Alexander of Aphrodisias describes the Stoics’ view of fate in this way:

[S]ince the world is a unity which includes all existing things in itself and is governed by a living, rational, intelligent nature, the government of existing things which it possesses is an everlasting one proceeding in a sequence and ordering. . . . For nothing in the world exists or happens causelessly, because none of the things in it is independent of, and insulated from, everything that has happened before. . . . They say that the very fate, nature and rationale in accordance with which the all is governed is god. It is present in all things which exist and happen, and in this way uses the proper nature of all existing things for the government of all. (*On fate* 191, 30-192, 28)

Because of the rational nature of the cosmos, the Stoics believed that the universe is ultimately knowable: “[I]f there were some human being who could see with his mind the connection of all causes, he would certainly never be deceived. For whoever grasps the causes of future things must necessarily grasp all that will be” (Cicero, *On divination* 1.127).

The rational principle, according to the Stoics, is similar to a sperm that inseminates inanimate matter, resulting inevitably in a perfectly ordered nature:

At certain fated times the entire world is subject to conflagration, and then is reconstituted afresh. But the primary fire is as it were a sperm which possesses the principles [*logoi*] of all things and the causes of past, present, and future events. The nexus and succession of these is fate, knowledge, truth, and an inevitable and inescapable law of what exists. In this way everything in the world is excellently organized as in a perfectly ordered society. (Eusebius, *Evangelical preparation* 15.14.2 [HP 46G])

This order includes both animate and inanimate things. Diogenes Laertius describes the natural order of the cosmos: “Uppermost is the fire called ‘aether’ in which the sphere of the fixed stars is first created, and next the sphere of the planets. After this the air, and then the water, and as foundation of everything the earth, which is at the center of all things” (*Lives of the Philosophers* 7.137).⁷³ Animate objects “must be sharper and greater” than inanimate objects because they “have some part of the world’s commanding faculty. “For every nature which is not isolated and simple but conjoined and composite must have within itself some commanding faculty, such as intelligence in man, and something resembling intelligence in beasts . . . [and] trees too and plants are thought to have a commanding faculty in their roots” (Cicero, *De nature deorum* 2.23-5, 28-30). Finally, human beings occupy the second highest spot in the natural order on account of having reason as their commanding faculty: “What is best in man? Reason: with this he precedes the animals and follows the gods” (Seneca, *Letters* 76.9-10). The Stoic concept of Nature plays a dual role in causal explanations. According to Long, “To say of something that it is natural in Stoicism is to combine description with evaluation. Nature

⁷³ This physical description of the universe is not radically different from Ptolemy’s model of concentric spheres, though it is not informed by Christian theology.

embraces both the way things are and the way they should be (*Hellenistic Philosophy* 169). For the Stoics then, Nature is both factual and normative, what is and what should be; it is at once ontological and teleological.

The *Instauratio Magno*

Though in his lifetime Bacon was best known for his activities in Parliament and in the courts of Elizabeth and James, his lasting reputation is related to his book of *Essays* and the philosophical texts he produced after his disgrace. While these works, especially the philosophical texts, are now seen by some as contributing to the scientific revolution, there is no question that they are also part and parcel of the humanist context of the Renaissance. In particular, they are consistent with the branch of Renaissance humanism that Bouwsma associates with Stoicism and has identified as being concerned with the exercise of human rationality. While Bacon called his works philosophical they are, to an even greater degree, rhetorical, using language that is carefully crafted to persuade those who read the texts to accept a version of the natural world that is radically different from the prevailing model.

Renaissance cosmology depicted nature as a “great chain of being” in which each element of the chain exercised some degree of command over all other inferior elements. Because theological and political institutions relied upon such a model to justify their own hierarchical structures, a mechanistic world view that posited regular and discernible natural laws might well threaten such institutions. Thus, it is not likely that widespread trust in the findings of the natural philosophers, which was prerequisite to the acceptance of the mechanistic world view and the development of scientific institutions, would have come about simply because those findings were “self-evident.” Rather, the new philosophy had to be fitted to the contemporary worldview. The *Instauratio Magno* and Book I of *Novum Organum* constitute just such an argument. Stoic philosophy, i.e., the

received Stoicism of the Renaissance, provided a set of concepts that could be used to forge a middle way between the theological/political tradition and the new natural philosophy. Bacon's use of Stoic principles was subtle. Unlike Lipsius, who sought to reintroduce Stoic philosophy but truncated and altered it to fit within the framework of Renaissance theology, Bacon culled concepts that were useful to his project, without necessarily attributing them to the Stoics.

The Goal and Plan of the Work

In 1620 Bacon published the *Instauratio Magno*, which consisted of the *Novum Organum* along with a number of prefatory texts. In this work, he proposed a new "instauration," an intellectual edifice that he believed should take the place of the then-current, and in his eyes, impotent status of human knowledge. In the Proemium, Bacon argued that "the entire fabric of human reason which we employ in the inquisition of nature is badly put together and built up, and like some magnificent structure without any foundation," and he proposed to begin "a total reconstruction of sciences, arts, and all human knowledge, raised upon the proper foundations" (*PW* 241). He found that the state of knowledge as it then existed was "not prosperous nor greatly advancing" and believed that an entirely new way should be opened so that "the mind may exercise over the nature of things the authority which properly belongs to it" ("Author's Preface," *PW* 243). The new edifice that Bacon imagined was founded upon the empirical observation of "things of nature." This interrogation of nature was to be guided by a method that was itself based upon human nature, i.e., a method that was designed according to Bacon's understanding of the human perceptual and intellectual faculties. This method accommodated the flaws in human nature that stood in the way of achieving more accurate and productive knowledge. Bacon articulated two goals for the new instauration: initially, he hoped to improve the human condition through technological innovation,

which was to be achieved through experimentation; and, ultimately, he anticipated the discovery of a *philosophia primum*, a set of general principles drawn from the careful and methodical examination of particular instances. These goals encompass both the pragmatic values of humanism and the desire for theoretical knowledge of the new natural philosophy that was the basis for the scientific revolution.

The tasks that Bacon set for himself in the *Instauratio Magno* demonstrate the degree to which his work was at once rhetorical and philosophical. The first task, which was clearly rhetorical, was to make a case for the study of nature as appropriate work for humanity. The second task, which he called a purging of the intellect, combined rhetorical and philosophical elements. The third, the explication of his new method, which included a gathering and winnowing of particulars, was clearly philosophical in nature and intent. Further, to the degree that Bacon's great instauration was not merely a method, but included recommendations for institutional change as a way of realizing the method and gaining benefits from it, it is both humanistic and "scientific." Stoicism, with its beliefs that nature was normative and that physics was the foundation upon which other forms of philosophy were predicated, and humanism, which provided the rhetorical strategies upon which Bacon draws, form the context for his efforts.

Making the Case for Natural Philosophy

Bacon's argument in favor of the study of nature as the basis for a new epistemology was certainly not unique during the Renaissance, but it was among the more sophisticated and successful of such efforts. Unlike Galileo who, for example, used the rhetorical form of the dialogue to mitigate the impact of his "heretical" conclusions,⁷⁴

⁷⁴ Galileo's theories were accepted as valid by many practitioners of the new philosophy across Europe, though not ironically by Bacon himself. It was only inside Italy, where the Catholic Church controlled the publication of his work, that he had to resort to such strategies.

Bacon's intention was not merely to justify his own experimental and theoretical work. Rather, he hoped to influence culture more broadly, arguing for the establishment of institutions in which theoretical and productive endeavors would yield knowledge and inventions that would improve the situation of humankind. In a cultural milieu in which the foundations of knowledge and authority were under assault from all sides, Bacon's "new philosophy" offered the promise of a degree of epistemological certainty to anyone willing to engage in the careful and methodical study of nature. Nevertheless, he recognized the need to accommodate the concerns of a number of different groups, including natural philosophers and humanists. Bacon argued that the study of nature was not the kind of mere solipsism of which the humanists accused their scholastic predecessors, but a productive art that could yield tangible benefits for humankind. At the same time, he countered the objections of theologians by arguing that nature was God's creation. While he never directly presented a view of nature that refers directly to Stoicism, he certainly drew on Stoic imagery and concepts to make his case.

Bacon did not contest the commonly accepted view of nature as a divine creation that was corrupted as a result of the fall from grace of Adam and Eve. Rather, he exploited the creation story effectively to his own ends. Prior to the fall, Bacon argued, Adam had enjoyed a "pure and uncorrupted natural knowledge" ("Preface," *PW* 246). As a consequence of the fall, Bacon suggests, such knowledge was no longer readily available, but was hidden: "But the universe to the eye of the human understanding is framed like a labyrinth; presenting as it does on every side so many ambiguities of way, such deceitful representations of objects and signs; natures so irregular in their lines, so knotted and entangled" ("Preface," *PW* 245). Though it is difficult for the human understanding to penetrate the mysteries of nature, however, Bacon did not believe that

those ways were chaotic or capricious. In his *Confession of Faith*,⁷⁵ Bacon describes how the creation is governed by laws ordained by God:

He created heaven and earth, and all their armies and generations, and gave unto them constant and everlasting laws, which we call *Nature*, which is nothing but the laws of creation; which laws nevertheless have had three changes or times, and are to have a fourth and last. The first, when the matter of heaven and earth was created without forms: the second, the *interim* of every day's work: the third, by the curse, which notwithstanding was no new creation, but a privation on part of the virtue of the first creation: and the last, at the end of the world, the manner whereof is not yet revealed. So as the laws of Nature, which now remain and govern inviolably till the end of the world, began to be in force when God first rested from his works and ceased to create; but received a revocation in part by the curse, since which time they change not. (*Works* vii.220-1)

In representing nature as a regular system governed by laws established by God, Bacon was able to argue for a reform of education based on natural philosophy.

Bacon recognized the need to deal with religious beliefs and the objections of the church before advancing learning along the paths that he mapped out in the *Instauratio Magno*. When he addressed his culture's "disgraces and discredits" of learning (*Adv. Learning*, *PW* 43), he first addressed those of the divines. As Galileo's experience illustrates, religious doctrine and institutions were, perhaps, the greatest impediment to the pursuit of natural philosophy. In large part, the objections of the divines were related to concerns that too much learning leads to the kind of arrogance and overreaching that

⁷⁵ Though perhaps written earlier, the *Confession* was published in 1603.

lead to the fall, or to atheism, or that “contemplation of second causes doth derogate the mind from our dependence upon God, who is the first cause” (44). Bacon also recognized that it was not sufficient merely to critique the church’s objections to learning; he needed also to present an alternative model of natural knowledge that did not conflict with religious doctrine. First, he makes a distinction between divine revelation and natural philosophy and the means by which we are to understand them. In *De augmentis*, Bacon distinguishes between the two types of knowledge:

For knowledge of man is as the waters. Some waters descend from above, and some spring from beneath; and in like manner the primary division of sciences is to be drawn from their sources; of which some are above in the heavens, and some here below. For all knowledge admits of two kinds of information; the one inspired by divine revelation, the other arising from the senses. . . . I will therefore divide knowledge into Divinity and Philosophy; meaning by Divinity Sacred or Inspired, not Natural Divinity. (PW 453)

While divine knowledge must be accepted unquestionably, Bacon believes that natural philosophy is subject to human reason. In dividing natural philosophy and divine revelation in this way, Bacon avoided criticism that he was making the study of nature superior to received Biblical knowledge. At the same time, however, he manages to legitimate knowledge gleaned from nature so that it could be seen as roughly equivalent to truths received from divine inspiration. In one of his fragmentary texts, *Filum Labyrinthi*,⁷⁶ Bacon makes the case that knowledge gained from natural philosophy is not

⁷⁶ *Filum labyrinthi* (*Thread of the Labyrinth*) is a fragment that, according to Spedding, appears to correspond to Bacon’s Latin text, *Cogitate et visa*. It was not published until 1794. Spedding speculates that it was intended as part of the *Instauratio Magno* and was not a further explanation of Bacon’s method. At any rate its late publication suggests it would not have been an influential text during the early modern period. It does, however, help to clarify some of Bacon’s thinking regarding the justification for making natural philosophy the foundation for studies.

the same as the knowledge of good and evil, the “temptation which caused the original fall” (*PW* 209). First, he argues, knowledge of nature was already inherent in human beings as “the light whereof man discerned of every living creature, and imposed names according to their propriety” (209). Rather, it is moral philosophy that is harmful to the extent that it seeks “moral knowledge of good and evil, affected to the end to depend no more upon God’s commandments, but for man to direct himself” (209). Bacon further argues that, apart from this unquestionable acceptance of divine revelation, human beings are not only allowed, but commanded to seek further knowledge.

[N]either could he find in any Scripture, that the inquiry and science of man in any thing, under the mysteries of the Deity, is determined and restrained, but contrariwise allowed and provoked; for concerning all other knowledge the Scripture pronounceth, *That it is the glory of God to conceal, but it is the glory of man . . . to invent*; and again, *The spirit of man is as the lamp of God, wherewith he searcheth every secret*; and again most effectually, *That God hath made all things beautiful and decent, according to the return of their seasons; also that he hath set the world in man’s heart, and yet man cannot find out the work which God worketh from the beginning to the end*; shewing that the heart of man is a continent of that concave or capacity, wherein the content of the world (that is, all forms of the creatures and whatsoever is not God) may be placed or received. (*PW* 209; emphasis in original)

Bacon expands further the notion that humans have an obligation to study nature by arguing that such study “tendeth highly to the magnifying of the glory of God in his power, providence, and benefits; appearing and engraven in his works which without this knowledge are beheld but as through a veil; for if the heavens in the body of them do declare the glory of God to the eye, much more do they in the rule and decrees of them

declare it to the understanding” (*Filum Labyrinthi*, *PW* 210). Such understanding of the limitless possibilities of the power of God is, according to Bacon’s reading of Scripture, an imperative:

for to that purpose speaketh our Saviour in that first canon against heresies delivered upon the case of the resurrection, *You err, not knowing the Scriptures, nor the power of God*; teaching that there are but two fountains of heresy, not knowing the will of God revealed in the Scriptures, and not knowing the power of God revealed or at least made most sensible in his creatures. (*PW* 210; emphasis in original)

The sense that the study of natural philosophy is a sacred activity is reflected in the Preface and Plan of the *Instauratio Magno*. In the Author’s Preface, he prays

to God the Father, God the Son, and God the Holy Ghost, that remembering the sorrows of mankind and the pilgrimage of this our life wherein we wear out days few and evil, they will vouchsafe through my hands to endow the human family with new mercies. This likewise I humbly pray, that things human may not interfere with things divine, and that from the opening of the ways of sense and the increase of natural light there may arise in our minds no incredulity or darkness with regard to the divine mysteries; but rather that the understanding being thereby purified and purged of fancies and vanity, and yet not the less subject and entirely submissive to the divine oracles, may give to faith that which is faith’s. Lastly that knowledge now being discharged of that venom which the serpent infused into it, and which makes the mind of man to swell, we may not be wise above measure and sobriety, but cultivate truth in charity. (*PW* 246-47)

This prayer, which reiterates his intention not to question divine revelation, echoes a similar prayer at the end of the Plan of the Work:

And all depends on keeping the eye steadily fixed upon the facts of nature and so receiving their images simply as they are. For God forbid that we should give out a dream of our own imagination for a pattern of the world; rather may he graciously grant to us to write an apocalypse or true vision of the footsteps of the Creator imprinted on his creatures.

Therefore do thou, O Father, who gavest the visible light as the first fruits of creation, and didst breathe into the face of man the intellectual light as the crown and consummation thereof, guard and protect this work, which coming from thy goodness returneth to thy glory. Thou when thou turnedst to look upon the works which thy hands had made, sawest that all was very good, and didst rest from thy labours. But man, when he turned to look upon the work which his hands had made, saw that all was vanity and vexation of spirit, and could find no rest therein. Wherefore if we labour in thy works with the sweat of our brows thou wilt make us partakers of thy vision and thy sabbath. Humbly we pray that this mind may be steadfast in us, and that through these our hands, and the hands of others to whom we shall give the same spirit, thou wilt vouchsafe to endow the human family with new mercies. (*PW* 253-54)

While these prayers place the pursuit of natural philosophy clearly within a religious context, their language also reflects the commitment to an active life that is characteristic of Renaissance civic humanism. Bacon foresaw that the results of the study of nature would be, not merely knowledge, but tangible benefits.

Bacon's view of nature provided a means by which to reconcile, not only some of

the theological and epistemological conflicts of his time, but also the humanistic conflict between the *vita contempliva* and the *vita activa*. He uses the metaphors of “mines” and “caves” as a way of emphasizing the benefits to be gained from experimental and technological work. In his view, by immersing oneself within these deep mines and caves, it was possible both to divine nature’s secrets and reproduce the results of her actions for the benefit of one’s fellow humans. Bacon’s view of nature both synthesized a variety of ideas contained within the many philosophical texts recovered by the humanists and also provided a foundation which could be used to reconcile conflicts inherent within the humanist project.

A common metaphor for portraying nature during the Renaissance was as a secondary divine text, a book of nature equivalent to biblical texts. As Bouwsma describes it, there emerged from the new research in natural philosophy “an insistence that truth was of several kinds, among which the least certain was that composed by men. But God . . . had revealed not only the way of salvation in Scripture, but also another set of truths in the ‘book of nature’” (*The Waning of the Renaissance* 185). Galileo used this conceit in attempting to justify his research as reading the book of nature, as did Bacon himself.⁷⁷ There is no doubt that the metaphor was a powerful one in a culture so deeply embedded within a textual matrix as the Renaissance. In the *Advancement of Learning*, Bacon explains the ways in which philosopher’s reading of the book of nature works to support faith and religion:

There be two principal duties and services, besides ornament and illustration, which philosophy and human learning do perform to faith and religion. The one, because they are an effectual inducement to the exaltation of the glory of God: For as the Psalms and other Scriptures do

⁷⁷ See Charles Whitney, *Francis Bacon and Modernity*, 60-62, for a discussion of how Bacon developed this metaphor to conceptualize his new philosophy.

often invite us to consider and magnify the great and wonderful works of God, so if we should rest only in the contemplation of the exterior of them as they first offer themselves to our senses, we should do a like injury to the majesty of God The other, because they minister a singular help and preservative against unbelief and error: For our Saviour saith, *You err, not knowing the Scriptures, nor the power of God* ; laying before us two books or volumes to study, if we will be secured from error; first the Scriptures, revealing the will of God, and then the creatures expressing his power; whereof the later is a key unto the former; not only opening our understanding to conceive the true sense of the Scriptures, by the general notions of reason and rules of speech; but chiefly opening our belief, in drawing us into a due meditation of the omnipotency of God, which is chiefly signed and engraven upon his works. (*PW* 63-4)

In the Proemium to the *Instauratio Magno*, Bacon equates the study of nature with the act of interpreting, i.e., reading, in order to make the somewhat paradoxical point that humans, who are subservient to nature rather than its masters, may nevertheless gain some degree of mastery over nature only by observing it:

For man is but the servant and interpreter of nature: what he does and what he knows is only what he has observed of nature's order in fact or in thought; beyond this he knows nothing and can do nothing. For the chain of causes cannot by any force be loosed or broken, nor can nature be commanded except by being obeyed. And so these twin objects, human Knowledge and human Power, do really meet in one. (*PW* 253)

In this brief summary, Bacon represents the study of natural philosophy as a middle path between many of the conflicts that characterized the early modern era. While he does not refer specifically to religion, he presents the human pursuit of natural knowledge as a

necessary and obedient act rather than as an attempt to rise above the power of the Creator. In choosing to use the phrase “chain of causes,” Bacon evokes the familiar concepts of the great chain of being and the Aristotelian theory of causes, both of which he will later challenge.⁷⁸ He also manages, by asserting that human knowledge and power “meet in one,” to resolve the humanist conflict between the *vita contempliva* and the *vita activa*. In making his case for the study of natural philosophy, Bacon deploys a variety of theological, literary, and philosophical arguments. Ultimately, it was Bacon’s expertise in the humanist art of rhetoric that allowed him to write and speak so eloquently on behalf of natural philosophy.

In making the case for Stoicism as one of two faces of Renaissance humanism, Bouwsma argues that the notion that nature is the expression of god is a primary attraction: “[T]he hellenistic principle of immanence . . . makes the universe eternal, by one means or another deifies the natural order, and by seeing a spark of divinity in man tends to make him something more than a creature of God (“Two Faces of Humanism” 9). Bacon’s view of nature as an orderly system that may ultimately be perceived and even manipulated by human beings seems clearly to reflect this view. In the beginning of the Book II of *Novum Organum*, Bacon uses the phrase *natura naturans* to describe the specific or individual natures of the various elements of nature. The phrase, which Spedding translates as “nature-engendering nature” is equivalent to “form,” or “true specific difference,” or “source of emanation” (*NO* II.i). According to Spedding, the phrase is unique in Bacon’s works, and suggests that “[w]ith the later Schoolmen, as with Spinoza God was considered as the *cause immanens* of the universe, and therefore,

⁷⁸ These concepts were familiar to his audience, but it is unlikely that Bacon was referring to Aristotle’s theory of the four causes, which he ultimately rejects in the *Novum Organum*. It is likely that his understanding of causes is much closer to that of the Stoics.

according to the latter at least, not hypostatically different from it” (*PW* 302, n.1).⁷⁹ The Stoic view of god as logos, of course, was incompatible with Renaissance Christian theology. However, Bacon’s separation of divine knowledge from natural knowledge allows him to follow the Stoic model without contradicting Christian beliefs.

The contradictions between Stoicism and Christianity are sufficiently great that Bacon does not make obvious connections between the ancient philosophy and his own new philosophy. It is also the case that the status of the Stoic textual legacy would have made it difficult to formulate an authentic neo-Stoic physics. Additionally, the Stoic concept of god was certainly at odds with that of Renaissance Christian theology. However, the Stoics seem to be less concerned with the pantheon than with god as reason. Diogenes Laertius says, for example, “God, intelligence, fate, and Zeus are all one, and many other names are applied to him. In the beginning all by himself he turned the entire substance through air into water” (7.135). Aetius, too, said, “The Stoics made god out to be intelligent, a designing fire which methodically proceeds toward the creation of the world” (1.7.33, *HP* 46A).

While Bacon does not directly attribute elements of his thought to Stoic philosophy, the general assumption that nature is a source of normative knowledge is very strong. In addition, there are intimations of the connection, many of which are found in the images Bacon uses to describe human faculties and God as a maker or craftsman.⁸⁰ The Stoics used two primary images, fire and breath, or *pneuma*, in referring to reason, the *logos* of the universe. Bacon does not often use the image of fire, but blends the Stoic

⁷⁹ Spinoza’s use of the term is significant since he is perhaps the most faithful interpreter of Stoicism in the early modern age. See A. A. Long’s discussion of Spinoza’s Neostoicism in “Stoicism in the Philosophical Tradition: Spinoza, Lipsius, Butler.”

⁸⁰ See Antonio Perez-Ramos’s discussion of Bacon’s new philosophy as part of the “maker’s knowledge tradition in *Francis Bacon’s Idea of Science and the Maker’s Knowledge Tradition*.

image of breath with the Christian image of light.⁸¹ In his essay, “Of Truth,” Bacon explores this image at length.

The first creature of God, in the works of days, was the light of the sense; the last was the light of reason; and his sabbath work ever since, is the illumination of his Spirit. First he breathed light upon the face of the matter or chaos; then he breathed light into the face of man; and still he breatheth and inspireth light into the face of his chosen. (*PW* 750)

Bacon uses both images, light and breath, in describing creation in a way that is remarkably similar to the Stoic version of creation. The image of light, particularly in referring to reason and intellect, is common throughout Bacon’s work. Davis also demonstrates how Bacon uses the image of God as maker, craftsman, or architect in describing God (167-68).

Bacon’s attempts at natural history are loosely patterned on those of the Roman philosopher and playwright Seneca, who was also known for his moral essays and epistles. Entitled *Naturales Quaestiones*, these essays gather what is known about various natural phenomena, such as “Lights in the Sky,” “Terrestrial Waters,” and “Lightnings and Thunderings”. Bacon’s own attempts at natural histories, which include *De fluxu et refluxu maris*, *Historia venturum*, *Historia vitae et mortis*, and *Historia densi et rari*, follow Seneca’s in that they gather and compare various observations and theories on their different topics. However, Bacon owes an even greater debt to Seneca, to the extent that Seneca’s understanding of nature as a trove of normative knowledge is a forerunner of Bacon’s own. In the first of Seneca’s examinations of natural questions, he says:

I, for one, am very grateful to nature, not just when I view it in that aspect which is obvious to everybody, but when I have penetrated its mysteries;

⁸¹ See Walter B. Davis’s exploration of Bacon’s use of this image in “The Imagery of Bacon’s Late Work.”

when I learn what the stuff of the universe is, who its author or custodian is, what god is; whether he keeps entirely to himself or whether he sometimes considers us; whether he creates something each day or has created it only once; whether he is a part of the universe or is the universe; whether it is possible for him to make decisions today and to repeal in part any sort of universal law of fate; whether it is a diminution of his majesty and an admission of his error that he had done things which had to be changed. If I had not been admitted to these studies it would not have been worthwhile to have been born. (I.3-4)

Seneca also finds utility in the study of nature: “[T]he subtlety of thought exercised on the mysteries of nature will be no less successful in dealing with plain problems” (III.18). Seneca also implies an equivalence between divine knowledge and natural knowledge that is a pattern for Bacon’s:

Aristotle has said excellently that we should never be more reverent than when a subject deals with the gods. If we enter temples with composure, if, when we are about to approach a sacrifice, we lower our eyes, draw in our toga, if we assume every sign of modesty, how much more ought we to do so when we discuss the planets, the stars, the nature of the gods, lest in our ignorance we assert something rashly, impudently, or even lie knowingly. (*Natural Quaestiones* VII 30.1)

Finally, Seneca provides a foundation for Bacon’s understanding of the great work that needs to be founded upon the study of nature:

Nature does not reveal her mysteries once and for all. We believe that we are initiates but we are only hanging around the forecourt. These secrets are not open to all indiscriminately. They are withdrawn and closed up in

the inner sanctum. This age will glimpse one of the secrets; the age which comes after us will glimpse another. (VII.30.6)

Bacon, too, insists that his work is merely a step onto the path, not a completed journey. In the Plan of the *Instauratio Magno*, he describes the fifth part as an “Anticipation” of a natural philosophy, “for temporary use only, pending the completion of the rest, like interest payable from time to time until the principal be forthcoming” (*PW* 253). The sixth and final part “which discloses and sets forth that philosophy by which the legitimate, chaste, and severe course of inquiry which I have explained and provided is at length developed and established,” will be a long time in the making. He calls it a beginning and “the fortune of the human race will give the issue” (253). Like Seneca, he recognizes that the discovery of God through the study of nature is a long and arduous task. For Bacon, that task must be predicated upon purging the intellect of mistaken notions and old philosophies.

The Reform of Learning

In *The Advancement of Learning*,⁸² Bacon speaks to the importance of education in human society:

[L]et us conclude with the dignity and excellence of knowledge and learning in that whereunto man’s nature doth most aspire; which is immortality or continuance; for to this tendeth generation, and raising of houses and families; to this buildings, foundations, and monuments; to this tendeth the desire of memory, fame, and celebration; and in effect, the

⁸² Bacon published *The Advancement of Learning* in 1605. The text was expanded and translated into Latin as part of the *Instauratio Magno*, *De dignitate et augmentis scientiarum*, and published in 1623. Chronologically, *De augmentis* was the second part of the *Instauratio Magno* as it was published subsequent to the *Novum Organum*, although it precedes it in the organizational scheme. Spedding suggests that the text may actually have been completed earlier and delayed by the translator (“Editor’s Preface” to *De augmentis*, *PW* 413).

strength of all other human desires. We see then how far the monuments of wit and learning are more durable than the monuments of power or of the hands.[. . .] But the images of men's wits and knowledges remain in books exempted from the wrong of time and capable of perpetual renovation. Neither are they fitly to be called images, because they generate still and cast their seed into the minds of others, provoking and causing infinite actions and opinions in succeeding ages. (*PW* 73-4)

Education was the vehicle by which the values of humanism made their way through Renaissance culture. According to Bouwsma,

Viewed simply as a shift in emphasis within latter medieval education, Renaissance humanism may seem at first sight, a development of only mild and specialized interest; it hardly appears a likely vehicle for the cultural revolution widely associated with the renaissance. But, as recent experience has compelled us to realize, education is peculiarly sensitive to the world that surrounds it. For this reason pressures for the modification of educational programs are likely to express — and so, perhaps, to reveal — significant social change and even profound shifts in human values.

(Bouwsma, *The Culture of Renaissance Humanism* 7)

There can be little doubt that Bacon was aware of the importance of education to cultural change. In the *Instauratio Magno*, Bacon suggests that learning is the fundamental task of human beings, one that is necessary for both spiritual and material improvement of the human condition. This emphasis on learning as a means of bettering the human condition is consonant with the values of Renaissance civic humanism, but Bacon's insistence upon nature as the foundation for learning does not conform with the humanist educational emphasis on the art of rhetoric and the study of ancient texts. The fact that Bacon's proposal for the reform of education does not adhere strictly to the standard humanist

curriculum should not be interpreted to mean, however, that he was anti-humanistic. He did not, for example, remove rhetoric from the curriculum, but situated it within an expanded curriculum for the study of language. His educational reforms should be understood as an attempt to create a framework that would accommodate changes that had come about as the result of the activities of humanists, as well as those of explorers, artisans, and natural philosophers.

Bacon's goal was to develop an intellectual edifice that could accommodate all the conflicting facets of contemporary culture. He saw the wisdom in recovered philosophies, but he also recognized the degree to which the veneration of ancient wisdom was stifling innovation. He adhered to the tenets of Protestantism, but recognized the ways in which religious institutions impeded the practice of natural philosophy. He was fascinated by the technological developments of his day and hoped, not only to encourage them, but to coordinate such practical wisdom with natural philosophy. Stoicism represented a synthetic and comprehensive philosophy and served as a model for the kind of edifice for learning Bacon hoped to construct. In *Of the Proficiency and Advancement of Learning*, Bacon set out his plan for a division of learning that would lead to the kind of philosophically-based society that he hoped to create.

The *Advancement of Learning*, which comprises an extensive proposal for the reform of learning, is not merely a renunciation of humanist learning but a description of a comprehensive system founded upon the study of nature. Moreover, Bacon's educational reform is not merely curricular reform. Rather, it comprises a critique of the epistemological milieu of the late Renaissance and makes recommendations for both curricular and institutional reform. Furthermore, his curricular reform is not just a reorientation of emphasis from rhetoric to another part of the traditional liberal arts curriculum but describes a wholly new curricular organization based not upon the traditional model but on human nature. The *Advancement* advocates replacing the

traditional trivium and quadrivium with a division of the disciplines founded on natural philosophy. Bacon claimed that his reforms were original, and to the extent that what he described was unlike previous educational models, those claims are accurate. This is not to say, however, that his ideas are completely new. In fact, the ideas that inform his curricular reform demonstrate a significant debt to ancient philosophies, and most especially to Stoicism.

In the Plan of the *Instauratio Magno*, Bacon describes the *De augmentis* as a “summary or general description of the knowledge which the human race at present possesses,” including “not only things already invented and known, but likewise things omitted which ought to be there” (*PW* 248). Bacon dedicated the *Advancement of Learning* to King James as a tribute to the king’s great intellect and erudition, a “fixed memorial, and immortal monument bearing a character of signature both of the power of a king and the difference and perfection of such a king” (*PW* 43). Bacon says that the work will

consist of these two parts: the former concerning the excellency of learning and knowledge, and the excellency of the merit and true glory in the augmentation and propagation thereof; the latter, what the particular acts and works are which have been embraced and undertaken for the advancement of learning, and again what defects and undervalues I find in such particular acts; to the end that though I cannot positively or affirmatively advise your Majesty, or propound unto you framed particulars, yet I may excite your princely cogitation to visit the excellent treasures of your own mind, and thence to extract particulars for this purpose agreeable to your magnanimity and wisdom. (*PW* 43)

Bacon follows in a tradition of giving advice to rulers that had been established by his humanist predecessors, most famously, Machiavelli. The most notable precedent in the

English tradition was Thomas Elyot's *The Booke Called the Gouvernor*, which dealt in part with the proper character and training of a king.⁸³ Bacon's project differs, however, in significant respects: first, his emphasis is not on virtue itself, but on philosophy — the pursuit of knowledge, particularly knowledge of nature — as the proper path to attaining virtue; second, his advice is not directed toward changing character per se, but on changing the institutions and methods that, as far as the humanists were concerned, were charged with shaping character. Nevertheless, Bacon's purpose is to argue for the establishment of an educational system which would allow those who participate in it to attain skills that will allow them to live a virtuous life.

Mapping the Epistemological Landscape

Just as Bacon required a thorough natural history as foundational for improving natural philosophy, Bacon's plan for learning begins with a thorough survey of the history and status of learning. In the first book of the *Advancement of Learning*, Bacon begins by addressing what he calls the "discredits and disgraces of learning," and he provides what is essentially a map of the epistemological uncertainty of the late Renaissance. Bacon delineates arguments against learning perpetuated by the "zeal and jealousy of divines, . . . the severity and arrogancy of politiques, . . . and the errors and imperfections of learned men themselves" (43) and then systematically responds to those critiques. Divines, for example, object to learning on the grounds that the desire for knowledge was the cause of original sin, that "knowledge puffeth up," that concern with worldly knowledge distracts the attention from God, and that sometimes learned

⁸³ Elyot's text was published in 1531 and dedicated to Henry VIII in a letter that, similarly, praises the king's wisdom and learning. Elyot, however, was more concerned with explicating the qualities of a good commonwealth. Bacon's sycophancy, perhaps, led him to limit his discussion of the King's character to praise rather than advice. Also, by limiting his discussion to institutional and curricular reform of education, he dealt with a subject in which he knew James was interested, but in which he had little direct involvement. Also, James I was himself the author of a treatise on government, the *Basilikon Doron*, a treatise written to his eldest son Henry to advise him how to rule when he became king.

individuals have become atheists (43-4). “Politiques” object to learning on the grounds that it makes men soft and unfit for war or civic life and that learning leads to indecision or too much love for the contemplative life (46). In general, Bacon’s response to these “discredits and disgraces” are that they result from weakness of character rather than being the fault of learning and that selfless devotion to learning is not the cause but the cure for these problems (44-49). While Bacon considered these attitudes among “divines” and “politiques” regarding the advancement of knowledge to have serious consequences, he was more concerned about the attitudes of the learned themselves.

Bacon finds many problems with the contemporary state of learning, but he focuses on the rhetorical practices of the humanists and the stultified logic of the Scholastics as the most serious deficiencies of learning. He identifies three “distempers” of learning which he considers to be the most serious obstacles standing in the way of the advancement of learning: “the first, fantastical learning; the second, contentious learning; and the last, delicate learning: vain imaginations, vain altercations, and vain affectations” (*PW* 53). The last of these, which he treats first, is excessive concern with style, the most extreme example of which was the euphuistic style of John Lyly. Bacon argues that the humanists’ preoccupation with the search for ancient texts and their admiration for the style of those classical texts, which was precipitated both by their objection to the sterile wranglings of scholastic philosophers and by the need to persuade a variety of audiences, led⁸⁴ to the

study of eloquence and copie of speech, which then began to flourish. This grew speedily to an excess; for men began to hunt more after words than matter; and more after the choiceness of the phrase, and the round and clean composition of the sentence, and the sweet falling of the clauses, and

⁸⁴ Bacon erroneously traces the humanist preoccupation with rhetoric to Martin Luther’s rebellion against Catholicism.

the varying and illustration of their works with tropes and figures, than after the weight of matter, worth of subject, soundness of argument, life of invention, or depth of judgment. . . . Here therefore [is] the first distemper of learning, when men study words and not matter. (54)

Bacon does not wholly prohibit the use of eloquence, for he recognizes its usefulness in “civic occasions, of conference, counsel, persuasion, discourse, or the like” (55). Rather, he objects to the tendency of eloquent discourse to curtail inquiry: “for surely to the severe inquisition of truth, and the deep progress into philosophy, it is some hindrance; because it is too early satisfactory to the mind of man, and quencheth the desire of further search, before we come to a just period” (55).

Bacon is even more dismissive of scholastic logic, which he calls the second distemper of learning. According to Bacon, scholastic logic demonstrated two indicators of what he called “suspected and falsified sciences; the one, the novelty of and strangeness of terms; the other, the strictness of positions, which of necessity doth induce oppositions, and so questions and altercations” (55). In addition, he is critical of the tendency for scholastic logic to become focused on its own processes rather than on the subject under examination:

For the wit and mind of man, if it work upon matter, which is the contemplation of the creatures of God, worketh according to the stuff, and is limited thereby: but if it work upon itself, as the spider worketh his web, then it is endless, and brings forth cobwebs of learning, admirable for the fineness of thread and work, but of no substance or profit. (55)⁸⁵

⁸⁵The comparison of dialectic to spiders’ webs, which Bacon uses throughout his works, is almost certainly a borrowing from the Stoic philosopher Ariston, a member of the early Stoa, who wished to discard both logic and physics. According to Diogenes Laertius, Ariston said, “Dialectical reasonings . . . are like spiders’ webs, which, though they seem to display some artistic workmanship, are yet of no use” (*DL* II.vii.161).

Bacon's primary objection both to rhetoric and logic was that they were more concerned with language, i.e., with words and form of arguments, than with matter; they focused on *verba*, rather than *res*. He does not, however, advocate doing away with logic and rhetoric. Rather, he proposes a reform of education founded on nature, focusing on things rather than words, but that nevertheless recognizes the importance of words when they were kept in their place.

Curricular and Institutional Reform

In Book II of *The Advancement of Learning* Bacon describes a comprehensive reform of learning at both the institutional and disciplinary levels. At the institutional level, he is concerned with resources, such as libraries, with support for scholars, and with cooperation between and among educational institutions. This concern with institutional aspects of education as a way to secure the blessing of learning for the good of the citizenry is certainly consonant with the humanist tradition, and it demonstrates Bacon's attempt to unite the *vita activa* and *vita contempliva*. Bacon hoped that James would support in substantial material ways the educational reforms that he recommends in the *Instauratio Magno*. In the Epistle Dedicatory, Bacon asks that James follow Solomon's example in

taking order for the collecting and perfecting of a Natural and Experimental History true and severe (unencumbered with literature and book-learning), such as philosophy may be built upon — such, in fact, as I shall in its proper place describe; that so at length, after the lapse of so many ages, philosophy and the sciences may no longer float in air, but rest on the solid foundation of experience of every kind, and the same well examined and weighed. I have provided the machine, but the rest must be gathered from nature. (*PW* 242)

Bacon was not asking merely for James's encouragement; in fact, he hoped that James would provide resources to endow institutions in which the research for this natural and experimental history would occur. In the *Advancement of Learning*, Bacon identifies three "objects" involved in learning: places, books, and persons (*PW* 75). Regarding books, he was concerned with the institution of libraries for assembling the works of ancient authors and with commissioning the production of new and more accurate translations of these authors (75).

There are four items to be considered regarding the places of learning: "foundations and buildings, endowments with revenues, endowments with franchises and privileges, institutions and ordinances for government; all tending to quietness and privateness of life, and discharge of cares and troubles" (*PW* 76). Bacon was concerned that the colleges and universities of Europe were primarily places for professional education and argued that institutions dedicated to the arts and sciences were needed. He argued for institutions that were devoted to the pursuit of theoretical knowledge in order to form a better foundation for philosophical education. He also sought to reform faculty compensation, arguing that the most competent teachers must be adequately compensated. Education ought not, however, be focused solely on what is found in books. Bacon also sought to encourage "men to sell their books and build furnaces" (*PW* 77). He wanted to build on the growing trend of experimental philosophy and sought means of providing the instruments for that work. Finally, he was concerned with the governance of educational institutions, particularly regarding curriculum and communication between and among institutions (*PW* 77-79).

Having touched on the outlines of institutional reform, Bacon spends most of his time in Book II on his recommendations for disciplinary and curricular reform, and it is here that the complicated relationship between Bacon's thought and that of ancient philosophies is most apparent. As his title *Novum Organum* indicates, Bacon saw his

Great Instauration as a replacement for Aristotle's *Organon*, the set of philosophical texts that formed the foundation for the received tradition of the Renaissance. As his biographer Rawley indicates, Bacon very early developed a "dislike" of Aristotelian philosophy for the "unfruitfulness" of his method, although he "ascribe[d] all high tributes" to the author (*PW* 2). His comprehensive scheme for learning is imitative not only of the wide-ranging approach of Aristotle's own school, but also of the broadly-based *paideia* tradition from the ancient world.⁸⁶ Rather, he proposed to classify the disciplines according to human nature rather than tradition, but his organization was nevertheless compatible with the humanist impulse to rely on ancient knowledge.

Bacon devised a disciplinary classification that was based on faculty psychology,⁸⁷ the model of human psychology that was then current, and on distinctions between the sacred and the mundane, consistent with distinctions he made between natural and divine knowledge. Generally speaking, faculty psychology divided the human psyche into a number of divisions, some appetitive, which applied to physical aspects of behavior, and some intellective, which applied to mental activity. Bacon's classification of the faculties was a relatively simple one, which made a primary distinction between understanding and the will, which translated understanding into action. There was a further division of the understanding into three parts: memory, imagination, and reason:

The parts of human learning have reference to the three parts of Man's Understanding, which is the seat of learning: History to his Memory, Poesy to his Imagination, and Philosophy to his Reason. Divine learning receiveth the same distribution; for the spirit is the same, though the revelation of oracle and sense be diverse[.] (*Adv.*, *PW*, 79)

⁸⁶ Bacon, of course, rejects the traditional organization into the trivium and quadrivium.

⁸⁷ See Park and Kessler's discussion of faculty psychology in the *Cambridge Companion to Renaissance Philosophy*, 455-63. For the influence of Stoicism on Renaissance views of faculty psychology, see A.H.T. Levy 93ff.

Bacon expands on his theories regarding the faculties and the division of the arts in *Descriptio Globi Intellectualis (A Description of the Intellectual Globe)*:

And hence it is evident that from these three fountains [memory, imagination, and reason] flow these three emanations, History, Poesy, and Philosophy; and that there cannot be other or more than these. For under philosophy I include all the arts and sciences, and in a word whatever has been from the occurrence of individual objects collected and digested by the mind into general notions. Nor do I think that there is need of any other division than this for Theology. For the information of revelation and of sense differ no doubt both in matter and in the manner of entrance and conveyance; but yet the human spirit is one and the same; and it is but as if different liquors were poured by different funnels into one and the same vessel. (*Descriptio, PW 677*)

Bacon's ideas regarding these faculties are based on his notions regarding impressions, which are sensory images received by the mind. Impressions, which are the province of history, are the "most ancient guests of the human mind, and are as the primary material of knowledge" (*PW 677*). The mind "perpetually exercises itself, and sometimes sports" with these impressions. He describes the process of human learning as follows:

For the images of individuals are received by the senses themselves and fixed in the memory. They pass into the memory whole, just as they present themselves. Then the mind recalls and reviews them, and (which is its proper office) compounds and divides the parts of which they consist. For the several individuals have something in common one with another, and again something different and manifold. Now this composition and division is either according to the pleasure of the mind, or according to the nature of things as it exists in fact. (*PW 677*)

When the mind's activity is "according to the pleasure of the mind" and involves the transposition of "parts" of sensory impressions into "the likeness of some individual," Bacon places it within the province of poesy (*PW* 677). Imagination is the faculty related to poesy and it is not "bound by any law and necessity of nature or matter," so that it may "join things which are never found together in nature and separate things which are primary parts of individuals" (*PW* 677). Nevertheless, imagination is constrained by the primacy of impressions, for "of things that have been in no part objects of the sense, there can be no imagination, not even a dream" (*PW* 677). While poesy is related to the imagination, philosophy is the work of the faculty of reason and its material is the "evidence of things, and as they really show themselves in nature, or at least appear to each man's comprehension to show themselves" (*PW* 677).

Bacon's reorganization of learning, as it is represented in *The Advancement of Learning* and its later Latin translation, *De augmentis*, is intended to be the means to achieve a comprehensive and synthetic philosophy. In the ancient world, only the Aristotelian and Stoic schools provide models for such a system, and there are clearly problems with asserting that either is foundational for Bacon. Bacon himself declared his general antipathy for Aristotle's method, and he was frequently critical of aspects of Stoic philosophy. However, while it does not incorporate all aspects of Stoic philosophy, Bacon's system is founded upon similar assumptions about the primacy of nature and about its regularity and comprehensibility.

One remarkable aspect of Stoicism is the degree to which all parts of the philosophy, i.e., physics or natural philosophy, logic, and ethics or moral philosophy, were fully integrated with one another. The Stoics used a number of metaphors to describe this interrelationship. According to Diogenes Laertius,

Philosophy, they say, is like an animal, Logic corresponding to the bones and sinews, Ethics to the fleshy parts, Physics to the soul. Another simile

they use is that of an egg: the shell is Logic, next comes the white, Ethics, and the yolk in the center is Physics. Or again, they liken Philosophy to a fertile field. Logic being the encircling fence, Ethics the crop, Physics the soul or the trees. Or, again, a city strongly walled and governed by reason. (vii,39)

In his description of his philosophical system Bacon invokes an organic metaphor that echoes those used by the Stoics:

In philosophy, the contemplations of man do either penetrate unto God, or are circumferred to Nature, or are reflected or reverted upon Himself. Out of which several inquiries there do arise three knowledges, Divine philosophy, Natural philosophy, and Human philosophy or Humanity. For all things are marked and stamped with this triple character, of the power of God, the difference of nature, and the use of man. But because the distinctions and partitions of knowledge are not like several lines that meet in one angle, and so touch but in a point; but are like branches of a tree that meet in a stem, which hath a dimension and quantity of entireness and continuance, before it come to discontinue and break itself into arms and boughs; therefore it is good, before we enter into the former distribution, to erect and constitute one universal science, by the name of *Philosophia Prima*, Primitive or Summary Philosophy, as the main and common way, before we come where the ways part and divide themselves. (*PW, Adv. of Learning* 89-90)

The educational system that Bacon proposed was predicated on the notion that nature, which was the expression of the power and will of God, could be perceived, understood, and, to a degree manipulated by human beings. It was, however, only by submitting oneself to nature that it could be controlled. This submission to nature, which reflects

both Stoic philosophy and Christian theology, is evident in Bacon's use of human nature, or faculty psychology, as a means of organizing learning. Bacon's new philosophical method also reflects his attempt to accommodate human nature's weaknesses as well as its strengths.

Purging the Intellect

While there is no question that Bacon saw the goal of his project as an improvement of the human situation, it clearly involves a transformation of more than just the arts:

This doctrine, then, of the expurgation of the intellect to qualify it for dealing with truth is comprised in three refutations: the refutation of the philosophies; the refutation of the demonstrations; and the refutation of the natural human reason. The explanation of which things, and of the true relation between the nature of things and the nature of the mind, is as the strewing and decoration of the bridal chamber of the mind and the universe, the divine goodness assisting, out of which marriage let us hope (and be this the prayer of the bridal song) there may spring helps to man, and a line and race of inventions that may in some degree subdue and overcome the necessities and miseries of humanity. ("Plan of the Work," *PW* 251)

Bacon recognizes the difficulty inherent in studying nature. Nevertheless, he believes that penetration into nature's mysteries is possible, but only if first "a more perfect use and application of the human mind and intellect be introduced" (246). The difficulty of the task Bacon set for himself and his fellow human beings was worth it. The reward for following the inductive method to observe nature was to "see things exactly as they are," and to gain the benefits which come from God's power.

Although Bacon saw his project as the foundation of a new epistemological system to replace the Aristotelian system that had so long held sway, it is not fully system. This was the case, in part, because Bacon did not begin producing the bulk of his philosophical works until late in his life, after his disgrace at court. More importantly, however, Bacon saw his Great Instauration as a beginning of knowledge rather than the end. The Plan of the Instauration Magno identifies six parts. The first part, the Division of the Sciences, was published in 1604 as *The Advancement of Learning*. The second part was the *Novum Organum*, or New Organon, an inductive method for making observations of nature. The word “organon,” which means instrument, referred at that time to Aristotelian logical texts, in general, and more specifically to syllogistic reasoning which was commonly used during the Renaissance. Bacon objected to deductive reasoning because it was based on words, using propositions to derive other propositions, rather than beginning with nature. Bacon considered that the state of learning, as it then existed, was deficient because abstract principles had been hastily derived from insufficient observation. Thus, he considered it necessary to purge the intellect of this deficient learning before commencing the new instauration. The most comprehensive discussion of these obstacles occurs in *Novum Organum* in the discussion of the Idols of the Mind. Bacon identifies four idols that “so beset men’s minds that the truth can hardly find entrance, but even after entrance obtained, they will again in the very instauration of the sciences meet and trouble us, unless men being forewarned of the danger fortify themselves as far as may be against their assaults” (*NO* I.xxxviii). These are the Idols of the Tribe, of the Cave, of the Marketplace, and of the Theatre.

The Idols of the Tribe are those that are inherent in human nature. Bacon says that “perceptions as well of the senses as of the mind are according to the measure of the individual and not according to the measure of the universe.” The human understanding, Bacon argues, is “like a false mirror, which receiving rays irregularly, distorts and

discolours the nature of things by mingling its own nature with it” (I.xli). Bacon summarizes the Idols of the Tribe as those which rise from “the homogeneity of the substance of the human spirit, or from its preoccupation, or from its narrowness, or from its restless motion, or from an infusion or the affections, or from the incompetency of the senses, or from the mode of impression” (I.iii). In general, Bacon’s idols of the tribe refer to tendencies related to inferring general principles from particular instances (I.xlv-li).

The Idols of the Cave are those which are related to the “peculiar constitution, mental or bodily, of each individual” and of the education and experiences which each individual experiences (I.iii). The idols of the cave include an individual’s preference for a particular discipline, for antiquity or for novelty, for analysis or synthesizing (I.iii-lviii). These idols arise from “the predominance of a favourite subject, or out of an excessive tendency to compare or distinguish, or out of partiality for particular ages, or out of the largeness or minuteness of the objects contemplated” (I.lviii). Bacon suggests that any student should be wary that “whatever his mind seizes and dwells upon” is potentially an idol and that care should be exercised to “keep the understanding even and clear” (I.lviii).

The Idols of the Marketplace are those related to discourse by which humans interact with one another:

For it is by discourse that men associate; and words are imposed according to the apprehension of the vulgar. And therefore the ill and unfit choice of words wonderfully obstructs the understanding. Nor do definitions or explanations wherewith in some things learned men are wont to guard and defend themselves, by any means set the matter right. But words plainly force and overrule the understanding, and throw all into confusion, and lead men away into numberless empty controversies and idle fancies.
(I.xliii)

Bacon believes that words are particularly problematic because, while “men believe that their reason governs words . . . it is also true that words react on the understanding” rendering intellectual enterprises “sophistical and inactive” (I.Ix). Bacon identified two specific types of linguistic idols: words that name things that do not exist and propositions that result from faulty abstraction (I.Ix).

The last of the four idols, the Idols of the Theatre, are neither innate, as are the idols of the Tribe and the Cave, nor do they influence us without our being aware of it as do the Idols of the Marketplace. Rather, Bacon says, the Idols of the Theatre “are plainly impressed and received into the mind from the play-books of philosophical systems and perceived rules of demonstrations” (I.Ixi). He identifies three classes of philosophical idols—sophistical or rational, empirical, and superstitious—all of which are “based on too narrow a foundation of experiment and natural history, and decided on the authority of too few cases” (I.Ixii). The Sophistical schools, among which he includes the philosophies of Aristotle, Anaxagoras, Leucippus, Democritus, Parmenides, Empedocles, and Heraclitus, “snatch from experience a variety of common instances, neither duly ascertained nor diligently examined and weighed, and leave all the rest to meditation and agitation of wit” (I.Ixii, Ixiii). The empirical schools, which include the alchemists and, perhaps, the philosophy of Gilbert, “having bestowed much diligent and careful labour on a few experiments, have then made bold to educe and construct systems; wrestling all other facts in a strange fashion to conform therewith” (I.Ixii, Ixiv). The superstitious schools of philosophy, which include Plato and the Pythagoreans, “out of faith and veneration, mix their philosophy with theology and tradition” (I.Ixii, Ixv). All of these schools, argues Bacon, are concerned with what he calls the “quiescent” rather than the “moving” or active principles of things (I.Ixvi). While Bacon does not include Stoic natural philosophy in his classification of the Idols of the Theatre, neither does he hold it up as an example of an ideal philosophy and in fact suggests that Zeno and later heads of

the school were among founders of “suspect schools.”⁸⁸ However, there are unmistakable similarities between the Bacon’s new philosophy and Stoic epistemology, which is primarily concerned with understanding how human beings come to know the world and to make sense of it. Given that the perfecting of an individual’s rationality was the human essential task, epistemological concerns were paramount for the Stoics. Critical to perfecting rationality and achieving virtue was understanding how the individual gains and evaluates knowledge. As Bacon’s discussion of the Idols of the mind suggests, he was also concerned with how knowledge is gained and secured.

The Stoics believed that the individual was born as a blank slate, a *tabula rasa*, or a blank sheet on which experience is written: “When a man is born, the Stoics say, he has the commanding-part of his soul like a sheet of paper ready for writing upon” (Aetius 4.11.1-4 [HP 39E]). Knowledge is gained in a number of ways. The initial apparatus by which knowledge begins is the “impression.” Stoics divided impressions into two main categories, sensory and non-sensory. A great deal of knowledge, especially knowledge of the material world, is gained primarily through sensory experience. The Stoics believed that the individual’s *pneuma* interacts with the *pneuma* of an external object, making an “impression” on the mind.⁸⁹ Non-sensory impressions “are ones obtained through thought such as those of the incorporeals and of the other things acquired by reason” (Diogenes Laertius 7.49-51 [HP 39A]). The mind is not merely a paper upon which multiple impressions are written. It also has associated with it and related to its rational nature, what the Stoics called “incorporeals”, which are concepts and functions the mind uses in the process of gaining understanding. Sextus Empiricus listed four “species” of

⁸⁸ Bacon suggests that subsequent Roman and Arabic philosophies are tainted because they are based upon the original Greek philosophies, and he includes Zeno, Chrysipus, and Carneades among the founders of the suspect schools. (I.lxxi).

⁸⁹ The Stoics describe sensory experience as an interaction between the immanent *pneuma* of the universe and the *pneuma* within every human being. See Long, *Hellenistic Philosophies*, 155-58.

incorporeals: sayables (*lekta*), void, time, and place (*Against the Professors* 10.218 [HP 27D]). The mind combines material impressions and incorporeals in the process of gaining and evaluating information. According to Aetius, once something is perceived, a memory remains, and a “plurality of impressions” leads to experience. He calls the results of experience “conceptions,” some of which occur through this process of perception, while others come through “our own instruction and attention.” These latter are only called conceptions, while the original impressions are also called “preconceptions.” He says that reason develops from these preconceptions by the time an individual is seven years old ([Aetius 4.11.1-4 [HP 39E]). Diogenes Laertius lists a number of ways individuals come to think about sense-objects in order to create conceptions from preconceptions, including similarity, analogy, transposition, combination, opposition, transition and privation (Diogenes Laertius 7.53). The Stoics also recognized several different species of impressions, including those which are convincing, unconvincing, true, and false.⁹⁰ Thus, the result of a single sensory experience could rarely be considered as genuine knowledge. The Stoics saw the process of gaining authoritative knowledge as a three-stage process: the individual first sees a thing in the world, after which an impression of the thing is made on the mind, and, finally, the mind understands or grasps the thing. These phases of the process of gaining knowledge were called “impression,” “assent,” and “cognition.” Human beings, as rational creatures, are able to differentiate between true and false impressions and only those impressions that are true may be fully grasped, or known. An impression is not sufficient, however, to count for knowledge. Once the impression is made, the individual may begin to believe it is true, but until it is grasped and understood, that knowledge is incomplete.

⁹⁰ The Stoics recognized a number of combinations of categories of impressions. For a more complete discussion, see Sextus Empiricus, *Against the Professors* 7.242-6.

Knowledge is always subject to some criterion of truth. The Stoics made a distinction between belief or opinion, which they called assent, and knowledge of understanding. According to Sextus Empiricus, there are three states of knowledge which are linked together:

scientific knowledge [*episteme*], opinion [*doxa*], and cognition [*katalepsis*] stationed between them. Scientific knowledge is cognition which is secure and firm and unchangeable by reason. Opinion is weak and false assent. Cognition in between these is assent belonging to a cognitive impression; and a cognitive impression, so they claim, is one which is true and of such a kind that it could not turn out false. Of these they say that scientific knowledge is found only in the wise, and opinion only in the inferior, but cognition is common to them both, and it is the criterion of truth. (*Against the Professors* 7.151-7 [HP 41C])

In some instances, true impressions come from experiencing “what is” exactly as it is. However, other impressions were shown to be true in other ways such as through logical demonstration.⁹¹

The Stoics used a variety of metaphors to describe the process by which the rational human gains knowledge and understanding. They compare impressions to the impression made in wax, with true impressions being made in a “craftsmanlike” way (Sextus Empiricus, *Against the Professors* 7.247-52 [HP 40E]); they also compare the process to a hand that curls its fingers to hold the impression and then grasps knowledge firmly in its fist:

Zeno used to clinch the wise man’s sole possession of scientific knowledge with a gesture. He would spread out the fingers of one hand and

⁹¹ See Long and Selby’s discussion of criteria of truth in *Hellenistic Philosophers* 249-53.

display its open palm, saying, “an impression is like this.” next he clenched his fingers a little and said, “Assent is like this.’ Then, pressing his fingers quite together, he made a fist, and said that this was cognition (and from this illustration he gave that mental state the name of *katalepsis*, which it had not had before.) Then he brought his left hand against his right fist and gripped it tightly and forcefully, and said that scientific knowledge was like this, and was possessed by none except the wise man. (Cicero, *Academia* 2.145)

Cicero neatly summarizes Stoic epistemology in this way:

The mind itself, which is the source of the senses and is even identical with the senses, has a natural force which it applies to the things by which it is activated. So it seizes some impressions in order to make immediate use of them, others, which are the source of memory, it stores away so to speak, while all the rest it arranges by their likenesses, and thereby conceptions of things are produced, which the Greeks call sometimes *ennoiai* and at other times *prolepsis*. With the addition of reason, logical proof and a multitude of innumerable facts, cognition of all those things manifests itself and reason, having been perfected by these stages, arrives at wisdom. (Cicero, *Academica* 2.30-1)

While Bacon does not fully delineate the process by which cognition occurs, it is clear from his description of the various Idols of the Mind that cognition is a process which requires significant attention. And while Bacon does not refer to Stoic cognitive theory in *Novum Organum*, he does use Stoic terminology. For example, he calls inferior forms of knowledge, such as that gained from the deficient philosophical schools, or that which is imagined, or that which comes from the weakness of human understanding, impressions. He also uses the term “assent” to describe a firm understanding, and the

ultimate term for “understanding truly” is *eucatalepsia* (I.cxxv). Bacon believed that it was possible to obtain a true and faithful knowledge of the world, and that such knowledge could lead to the betterment of the human condition:

Again, it will be thought, no doubt, that the goal and mark of knowledge which I myself set up . . . is not the true or best; for that the contemplation of truth is a thing worthier and loftier than all utility and magnitude of works; and that this long and anxious dwelling with experience and matter and the fluctuations of individual things drags down the mind to earth or rather sinks it to a very Tartarus of turmoil and confusion; removing and withdrawing it from the serene tranquility of abstract wisdom a condition far more heavenly. Now to this I readily assent; . . . For I am building in the human understanding a true model of the world, such as it is in fact, not such as man’s own reason would have it to be; a thing which cannot be done without a very diligent dissection of the world. But I say that those foolish and apish images of worlds which the fancies of man have created in philosophical systems, must be scattered to the winds. Be it known how vast a difference there is between the Idols of the human mind and the Ideas of the divine. The former are nothing more than arbitrary abstractions; the latter are the creator’s own stamp upon creation, impressed and defined in matter by true and exquisite lines.

(I.cxxiv)

The “true model of the world” that Bacon hoped to build in human understanding was predicated upon a new inductive method, which is the subject of Book II of the *Novum Organum*.

The New Organon

If Bacon's argument for the practice of natural philosophy cogently addresses the epistemological anxieties of the period, his new method has little to offer as a remedy. The "kind of logic," which he describes at length in the second book of the *Novum Organum*, was meant to replace the stultifying Aristotelian logic that was then in wide use and that had been developed to an extreme degree by the Scholastics. Organon, which means "instrument," referred to a series of Aristotle's texts (*Categories*, *On Interpretation*, *Prior* and *Posterior Analytics*, *Topics*, and *Sophistical Refutations*) that are related to logic and method. Perhaps the most significant difference between Aristotle's organon and Bacon's new philosophical method, was that Aristotle included a variety of logical strategies while Bacon advocated a single logical method (induction) for all types of inquiry. He argues that the method he proposes is new, based as it is upon inductive logic. While it is true that inductive logic is not the primary logic of ancient philosophies in general, nor of Stoic logic in particular, it certainly was not unknown. However, Bacon argues that his inductive logic is different from that of the ancients: "While it might be assumed that the ancients provided at the outset of their speculations a great store and abundance of examples and particulars, digested the same into notebooks under heads and titles, from them completed their systems and arts, and afterward, when they understood the matter, published them to the world" (I.cxxv), that is not the case, as is evident from their own descriptions of their work. Rather, they "flew at once to the most general conclusions, or first principles of science" having examined only "a few examples and particulars (with the addition of common notions perhaps of some of the received opinions which have been most popular)" (I.cxxv). Unlike the unfinished induction of his predecessors, Bacon's system advocated the gathering of instances and particulars as a foundation from which to infer general laws.

The exhaustiveness of assembling particulars was not the only difference between Bacon's inductive method and that of his predecessors. He was also concerned with examining active principles rather than "quiescent" elements of things, i.e., the elements of which they are composed. At the beginning of Book II, Bacon makes a distinction between the aims of human power and knowledge. The aim of human power is "to generate and superinduce a new nature or new natures" on a given body, while the aim of human knowledge is to "discover the form, or true specific difference, or nature-engendering nature, or source of emanation (for these are terms which come nearest a description of a thing)" (I.i). The secondary goal of human power is the transformation of concrete bodies and of knowledge, "the discovery in every case of generation and motion, of the *latent process*, carried on from the manifest efficient and the manifest material to the form which is engendered and in like manner the discovery of the *latent configuration* of bodies at rest and not in motion" (I.i). He privileges knowledge over power, and suggests that without knowledge, power is limited. Bacon's inductive method is the means by which knowledge is accumulated and secured.

Bacon's ideas regarding the composition of matter bear little resemblance to those of other philosophical schools. Although he grants the appropriateness of Aristotle's four causes, for example, he dismisses the system as ineffective in improving the understanding of the nature of things or leading to an active science (I.ii). He is concerned with discovering "Forms," but insists these do not correspond to the Platonic theory of forms as abstract Ideas, for "in nature nothing really exists besides individual bodies, performing pure individual acts according to a fixed law" (I.ii). Thus, he adopts terms from other philosophies without sufficiently redefining them. The method of tables he derives from these is equally confusing. It consists of a series of tabulations of what he calls "simple natures," qualities such as hard, soft, dense, light, porous, nonporous. The first table consists of instances in which the given nature is present, while the second table

consists of instances which resemble those of the first table, but from which the given nature is absent. The third table consists of instances in which the given nature increases or diminishes in response to alterations of physical conditions. The instances are combined with what Bacon calls “simple motions” and with a set of terms—such as “like,” “unlike,” “possible,” “impossible”—which he calls “transcendentals.”⁹² In Bacon’s system, the transcendentals are used for forming predicates and establishing the essential definitions that he seeks.

The success of Bacon’s endeavor was mixed. The natural history, i.e., the gathering of instances, he proposed was admired and adopted by many of the natural philosophers of his day, particularly in England. If any significant tabulations of instances ever occurred, it failed to produce the *philosophia primum* Bacon hoped for. Lisa Jardine argues that Bacon’s new logic received two quite different receptions in the early modern period. On the one hand, Bacon was seen by members of the British Royal Society, including Hooke, Herschel, Mill, and Wilkins, as the founder of the empirical school, particularly because of “the centrality to scientific endeavor of carefully tabulated and collated descriptions of external qualities of natural phenomena” (“*Experientia literata* or *Novum Organum*?” 47). Others, such as Gassendi and Mersenne, saw Bacon as a “system builder, intent on finding the indemonstrable first principles of things—the hidden essential natures of things—by means of a new logic” (48). However, they doubted the possibility “of getting from our particular experience of natural phenomena to the most profound generalities underlying these—the essential natures of which our senses detect only the external symptoms” (49) and suggest that there is no way to achieve anything more than a high degree of confidence, and not the “certainty of *scientia*” (60). The difficulty with the method, from either point of view, is that it begins with a “sceptical

⁹² Lisa Jardine notes that Bacon’s “transcendentals” are associated with Aristotle’s “transcendentals.” See “*Experientia literata* or *Novum organum*?” (47).

suspension of belief in ‘doxa’ or received opinion” (60) and defers the realization of general principles. Jardine argues that there are two ways of proceeding from this starting point. First is to “pare away all the superstructure of inference based on faulty sense-perception, received conventions of reasoning, and received beliefs and theories, inference that impedes the operation of an otherwise adequate intellectual faculty—and build *scientia* afresh *a priori* from there” (60). Certainly, this is what Bacon claims he is doing in the first book of the *Novum Organum*. The other alternative, according to Jardine, “is the radical sceptical one of giving up the quest for certainty in natural philosophy altogether, and being content instead with systematic attempts at providing limited possibilities for some kind of action in the form of tentative generalizations about the most readily accessible regularities in nature” (60). Jardine argues that Bacon attempts to have it both ways, “man of experimental science on the one hand; Aristotelian essentialist on the other” (60).

The discrepancy that Jardine identifies is mitigated by the belief, which Bacon shares with the Stoics, that it is possible to penetrate the mysteries of the physical world using the rational faculty. In the Preface to the *Instauratio Magno*, Bacon claims that through his method he has “established forever a true and lawful marriage between the empirical and rational faculty, the unkind and ill-starred divorce and separation of which has thrown into confusion all the affairs of the human family” (*PW* 246). Bacon echoes the claims of Seneca regarding the penetrability of nature’s secrets:

The very one who handles this universe, who established it, who laid the foundations of all that is and placed it around himself, and who is the greater and better part of his work, has escaped our sight; he has to be perceived in thought. Moreover many things related to the highest divinity or allotted a neighboring power are obscure. Or perhaps—which may surprise you more—they both fill and elude our vision. Either their

subtlety is greater than the human eye-sight is able to follow or such a great majesty conceals itself in too holy a conclusion. It rules its kingdom — that is itself — and grants no admission to any except the mind.

(*Naturales Quaestiones* VII, 30. 3-4)

Like Seneca, Bacon believed that achieving this knowledge was a slow and methodical process. Unlike the Stoics, however, who believed knowledge of nature would lead to individual virtue, Bacon followed his humanist values and saw nature's lessons as a means for improving the status of humankind.

The *Essays* as Method

For Bacon, who sought to establish a synthetic and comprehensive philosophical system, nothing would have been more desirable than to develop a universal logic that was transferrable across disciplines. As the passage from the *Novum Organum* at the beginning of this chapter indicates, Bacon believed that his method was such a universal logic. The *Essays*, for which he is perhaps best known in this century, represent just such an experiment. Although the style of the *Essays* seems contrived and awkward to today's audiences, they continue to be studied as a forerunner of a form which is now fully developed and widely used. Montaigne was the first to use the term *essay*, which is derived from the Latin *exagium*, the act of weighing, to describe a rather loose discursive form, generally personal in nature, in which the author speculated on subjects of interest both to individuals and society at large. Montaigne's essays, first published in 1580, are clearly personal and exploratory in nature and were intended to take the place of conversations with his closest friend, Etienne de La Boétie (Frame v). The *Essays* in Bacon's first edition, published in 1597, lack the personal voice that characterizes Montaigne's works, and seem clearly intended for a public audience. They are not meant to share his uncertainties, but to offer to his audience the benefit of his meditations on

commonly held views on various subjects. This first edition, published in 1597, was entitled *Essays. Religious Meditations. Places of perswasion and disswasion*, and included ten essays, *Meditationes Sacrae*, and *Of the Colours of Good and Evil, a Fragment. Mediationes Sacrae* are typical of Renaissance religious meditations, and *The Colours of Good and Evil*, is Bacon's "improvement" on a set of similar arguments in Aristotle's *Rhetoric*. Bacon continued to work on *The Essays* throughout his life and published two additional editions, one in 1612 and the third in 1625, a year before his death. The third and final edition contained a total of fifty-eight essays, including thirty-eight from previous editions which had been revised and expanded.⁹³ Although Bacon considered *The Essays* to be a tangential and relatively unimportant part of his total body of work, they are not unrelated to the rest of his philosophy.⁹⁴ Perhaps, most importantly, they demonstrate the degree to which Bacon's project is related to the Stoic form of Renaissance humanism.

In a letter dedicating the 1597 edition to his brother Anthony, Bacon explains that he is motivated to publish the essays because they were about to be published by others. He expresses uncertainty about the propriety of doing so, acknowledging that there "mought be as great a vanitie in retiring and withdrawing mens conceites . . . from the world as in obtruding them." Nevertheless, Bacon says that he has "played my selfe the Inquisitor, and find nothing to my understanding in them contrarie or infectious to the state of Religion, or manners, but rather (as I suppose) medicinable." The form of the *Essays* seems peculiar to modern readers. They do not consist of an argument with evidence. Rather, they consist of a series of statements, or *sententiae*, about a subject.

⁹³ For a brief but thorough discussion of the publication history, see "A Note on the Text and Annotation" in the Penguin edition of *The Essays* by John Pilcher. For a more comprehensive discussion, see R. W. Gibson's *Francis Bacon: A Bibliography of his works and Baconiana to the Year 1750*.

⁹⁴ See R.S. Crane, "The Relation of Bacon's *Essays* to His Program for the Advancement of Learning" for a discussion of how the *Essays* are related to the rest of Bacon's philosophical project.

Sometimes, Bacon juxtaposes contradictory aphorisms. Other times, he lists a number of commonplace assumptions about a subject, and then offers information which challenges them all. The experience of reading the *Essays* is confusing, perplexing. According to Stanley Fish, “the demands of the prose have left the reader in a state of ‘healthy perplexity,’ neither content with the notion he had been inclined to accept at the beginning of the experience, nor quite ready to put forward a more accurate notion of his own” (“Georgics of the Mind” 262). Fish likens the state of mind induced in the reader of Bacon’s *Essays* to that of the scientists, “observant, methodical, cautious, skeptical, and yet in long range terms, optimistic” (262). The relationship of the aphoristic style of the essays to the inductive logic of Bacon’s new philosophy, has been demonstrated amply by a number of scholars including Crane, Wallace, and Vickers. What has been explored less fully, however, is the relationship of the style of the essays to the inductive method.

The *Essays* operate in the realm of the contingent; they deal with subjects such as truth, dissimulation, envy, love, marriage and the single life, studies, and even gardens, about which there is much disagreement and for which there is little solid theoretical knowledge available to help us negotiate our differences. This is precisely the realm which Renaissance humanists saw as their arena. Moreover, Bacon uses many of the same tools that the humanists employed. Certainly, his *Essays* are not the polished and copious rhetoric of the humanists, but they deploy the same types of evidence: commonplaces, opinion, and, very frequently, appeals to the authority of the ancients and to Biblical authority.⁹⁵ What is perhaps most convincing in regards to the humanistic bent of the *Essays* is the way Bacon describes the action of various rhetorical strategies in *The Advancement of Learning*:

⁹⁵ Fish argues that that Bacon does not, in fact, value *sententiae* from the ancients or the Bible any more highly than any other evidence and that his use of such *sententiae* in the *Essays* serves to teach new readers to value all sources of evidence equally (269-271). Certainly, it is the case that Bacon sought to develop additional sources of authority, but he continued to value the wisdom of the ancients very highly.

And surely if the purpose be in good earnest not to write at leisure what men may read at leisure, but really to instruct and suborn *action and the active life*, these Georgics of the mind, concerning the husbandry and tillage thereof, are no less worthy than the heroical descriptions of Virtue, Duty, and Felicity. (*PW* 134)

It is clearly to the active life that Bacon addresses these ruminations.

In his summary of previous analyses of Bacon's essays, Fish notes that commentators have had difficulty reconciling the moralistic goal of the *Essays* with the analytical method. Fish suggests that the difficulty these commentators have is in the "assumed equation of 'scientific' and 'objective'" (253). Rather, he says, the "experience, rather than the materials of which it is composed, is what is scientific about the *Essays*" (253). Two things are problematic about this assertion. First, from the perspective of modern science, "experience" is not "scientific." The whole point of modern science is that the personal is discounted, that the subjectivity of the researcher is, to the greatest degree possible, removed from the experiment. Second, Fish's insistence upon dealing with the "experience" of the *Essays* suggests that their goal is not to establish some kind of objective truth, however that might be construed, but to produce a certain kind of person. That sort of development of moral character has largely been the province of humanists, not scientists. Thus, while Bacon's *Essays* may, indeed, be related to his new philosophy, they are not really "scientific."

The perplexing nature of Bacon's *Essays* is not a function of their being "scientific," but of their reflecting the Stoic strain of humanism rather than the more familiar Augustine/Ciceronian strain. A clue to interpreting the function, purpose, and tradition of the *Essays* lies in the subtitle *Religious Meditations. Places of perswasion and disswasion*. Meditation was a common activity during the Renaissance, and was generally not merely a mental discipline, but was practiced in writing. Generally,

meditation was a personal and spiritual practice, a means of examining and improving an individual's own soul. For Bacon, however, it seems clear that the practice of meditation could be applied much more broadly.

Bacon's *Essays* seem clearly related to the Stoic practice of *meditatio*, especially to that of Marcus Aurelius, whom Bacon greatly admired. However, to the degree that they are highly prescriptive acts related to judgment and persuasion and active rather than passive in nature, Bacon's essays are also humanistic and dialogic in nature. In his examination of *meditatio*, Robert Newman suggests that the process of meditation is not merely a logical exercise, particularly as it was practiced by Seneca. The *meditatio* cannot appeal only to the intellect; the whole person must change, and, therefore, the emotions, which are more difficult to overcome since they are not dependent on reason, must be the primary target of meditation. The constant and rigorous application of particular phrases and images helps to work on these emotions; they interiorize the *meditatio* by driving its considerations deep into the soul. As Seneca illustrated, simple syllogisms do not have the same force as repeated, hard-hitting phrases, since syllogisms entertain the mind, but do not effect one's emotional reaction. (1475).

Newman also argues that the use of rhetorical devices is a necessary component of *meditatio*, since its purpose is to persuade. "The powerful images and paradoxes which make up the *meditatio* are necessary to strip away the surface covering of opinion and to reveal a thing as it really is" (1478).

Bacon's New Philosophy as Humanistic Science

In describing Bacon's project, Gaukroger argues that his goal was to harness firmly to the yoke of the state a new attitude to knowledge, and in the course of attempting to do this, he was led to think through and transform this new attitude to knowledge. . . . The object of this reform

was both the practice and the practitioners of natural philosophy. He was concerned to reform a tradition of natural philosophy in which the central ingredients were areas such as natural history and alchemy: empirical, labour-intensive disciplines. (6)

Such a project is, of course, completely in keeping with the humanistic commitment to the *vita activa*, and Bacon's texts that deal with natural philosophy are all active in their focus. Both the *Advancement of Learning* and its expanded edition *De augmentis* describe contemporary objections to learning, enumerate the obstacles standing in the way of its advancement, and propose a reform of education, founded on the study of nature, including both theoretical and productive branches. The same can be said for the *Novum Organum*, a description and demonstration of his inductive method, which Bacon saw as a the means to laying the groundwork for an "active" science; and even those texts in which he deals directly with natural philosophy are primarily examples of his inductive method at work. But given Bacon's beliefs about the state of learning in his own time, how could it be otherwise? Theoretical knowledge was one goal of the new philosopher's activities in the caves and mines of nature.

Gaukroger describes Bacon's project as a "transformation of philosophy," a description with which Bacon would, no doubt, concur. However, Bacon's investigations of natural phenomena do not approach the quality of those of his contemporaries such as Galileo and Boyle, and quite often he had little respect for their ideas. It is, perhaps, not surprising that this is the case since Bacon's education was that of a humanist and his professional life was carried out in the law courts, the parliament, and the courts of Elizabeth I and James I. Moreover, as has previously been noted, philosophy was not generally part of the humanist project, which was more concerned with rhetoric and other

linguistic studies.⁹⁶ Thus, while Bacon describes a significant and comprehensive reform of learning, his writings resemble humanist practical wisdom more than philosophical texts. His recommendations for educational reform and his new method provided a new focus for study, a structure within which that study could take place, a heuristic for carrying it out, and a rationale for doing so. Rather than a transformation of philosophy, Bacon's contribution might more accurately be characterized as a rhetorical effort, a justification of natural philosophy and a plan for its nourishment and growth. Although Bacon ultimately contributed little to the practice of natural philosophy, he did provide a view of nature that accommodated both traditional theology and new claims based on the work of natural philosophers. Bacon drew on a variety of cultural commonplaces in making a case for orderly and rational nature. Bacon's inductive logic owes two principal debts to Stoicism. First, the Stoic view of nature as an orderly and creative process, helped Bacon make a case for nature as rule-ordered and comprehensible in an age when nature was largely regarded as mysterious and susceptible to the will of the Creator. The Stoic conflation of god with reason was useful for Bacon in this regard. Second, elements of Stoic epistemology served as a rationale for doing away with contemporary philosophy and as a foundation for Bacon's new inductive method. His borrowings from the Stoics provided Bacon with a means of expanding the humanist project and stabilizing the epistemological uncertainty of the Renaissance.

⁹⁶ See Kristeller's discussion of humanism's limited emphasis on moral philosophy in *Renaissance Thought and Its Sources*.

CHAPTER THREE

“TO SECOND REASON AND NOT TO OPPRESS IT”:

STOIC INFLUENCE ON BACON’S THEORIES OF RHETORIC AND DISCOURSE

Yet there hapn’d in my time one noble *Speaker* who was full of gravity in his speaking. His language, where hee could spare or passe by a jest, was nobly *ensorious*. No man ever spake more neatly, more presly, more weightily, or suffer’d lesse emptinesse, less idleness, in what hee uttered. No member of his speech but consisted of the owne graces. His hearers could not cough or looke aside from him without losse. Hee commanded where hee spoke, and had his Judges angry and pleased at his devotion. No man had their affections more in his power. The feare of every man that heard him was lest hee should make an end.

—Ben Jonson⁹⁷

Rhetoric is subservient to the imagination, as Logic is to the understanding,; and the duty and office of Rhetoric, if it be deeply looked into, is no other than to apply and recommend the dictates of reason to imagination, in order to excite the appetite and will.

—Francis Bacon⁹⁸

⁹³Timber 26.

⁹⁸De aug., PW 535.

Twentieth-century narratives of the scientific revolution have failed to acknowledged the importance of Bacon's role as an apologist for the new philosophy. In fact, Koyré's derisive sneer at Bacon's characterisation of himself as a "buccinator" of science suggests that Koyré believed the role of one who announced the arrival of the new philosophy was a largely insignificant one. But for those who understand the generative power of language, to announce something is, in a sense, to make it so. In fact, it is Bacon's recognition of the power of language to obscure humankind's perception of "the true nature of things" that impels much of his new philosophy. Not only have historians of science such as Koyré failed to recognize the significance of this role, so have many scholars of rhetoric and discourse, who have considered Bacon to have been the progenitor of an anti-rhetorical approach to discourse. Bacon's reputation as one who sought to put an end to humanism is based largely on his expressed aversion to Aristotelianism as a stultifying veneration of the past at the expense of the future, his claims for the novelty of his new system, and his concern that the humanist emphasis on rhetoric came at the expense of better knowledge of things. This understanding of Bacon's philosophy is entirely compatible with the common narrative of the scientific revolution as the triumph of abstract Platonism over stultified, medieval Aristotelianism and with assertions that the move toward modernity encompassed an attempt to find a plainer, more transparent discursive style. However, the notion that Bacon's ideas were completely novel and that he owed nothing to the ancients is not justified by a reading of his works, which mined the full gamut of ancient texts—mythologies, philosophies, histories and sacred texts—for commonplaces to support his arguments.⁹⁹ Moreover, while Bacon may have criticized the copious style of his contemporaries, he was well-trained by humanist tutors in the art of rhetoric and reputed to be one of its finest

⁹⁹ See Brian Vickers, "The Myth of Francis Bacon's 'Anti-humanism'," for a deconstruction of the various arguments that Bacon was anti-humanist.

practitioners in seventeenth-century England. As a humanist trained in rhetoric and as the self-proclaimed “buccinator” of the new philosophy, Bacon would certainly have recognized that producing and deploying arguments to advance the new philosophy was at least as important as developing a style of discourse particularly suited to the new epistemological endeavors.

Bacon’s anxiety about language has often been misrepresented as more radical than it actually was. While it is true that Bacon was deeply concerned about some of the discursive practices of his contemporaries, he was educated in a system that emphasized rhetoric and, if we are to believe the accounts of his contemporaries such as Ben Jonson, was one of its most adept practitioners. There is no question that among Bacon’s most significant contributions to modernity was the development of a “plain” style, but the antecedents of that style and its relationship to contemporary rhetoric, its relation to his epistemology, and its later influence continue to be subject to considerable debate. According to many modern histories of discourse, Bacon’s plain style de-emphasizes aesthetic considerations and attempts to achieve a kind of transparency in representing its subject clearly and accurately. While it is certainly the case that much of Bacon’s prose, when compared to the Ciceronian and Euphuistic styles of his contemporaries, is somewhat less ornate, it is a serious misstatement to suggest that he believed in the possibility of a “transparent” language in which there was no gap between signifier and signified. In fact, Bacon expressed serious doubts regarding the possibility of clear and accurate communication. Rather, his style is based on a belief that the gap between words (*verba*) and the things (*res*) they represent, when combined with certain limitations of human nature, society, and intellectual practices, make such communication difficult, if not impossible. More to the point, however, the suggestion that Bacon’s sole contribution to the development of science is the plain style, misrepresents his ideas about language and the degree to which discursive practices are imbedded in all human endeavor.

Furthermore, such a simplistic view of Bacon's work fails to examine the ways in which his theories about and use of language serve as a bridge between humanism and the new philosophy that is the forerunner to modern science. Bacon's ideas regarding language were formed within the humanist rhetorical tradition and are based upon a rhetorical sensitivity to language as human interaction, just as his reorganization of learning was founded on ideas from ancient humanist texts and the belief that learning should be organized according to human nature. An extensive and elaborate reform of both rhetoric and logic was central to Bacon's new instauration of learning, and while he claims that his reorganization of learning and his method are "new," it is clear that he follows the humanist tradition in that he incorporates aspects of a variety of schools of thought from previous centuries. His views on language are related to his division of the sciences and are similarly eclectic in their origins.

Bacon faced, as does anyone who thinks seriously about human language and the way it is used, a variety of contradictions that are rooted in the relationship between ephemeral words and the things they represent. For Bacon, these inherent inconsistencies were exacerbated by the linguistic complexity of his age, which included, on the one hand, reverence for recovered ancient Greek and Latin texts and, on the other hand, the abandonment of Latin as a common *lingua franca*, for vernacular languages. The resultant hermeneutical uncertainty was complicated by changes occurring on all levels of society, and by the wide variety of ideas and practices present in the intellectual milieu. In an age so filled with contradictions, it is difficult to situate Bacon within any particular linguistic or rhetorical faction. For example, while he objected to what he saw as too great an emphasis on rhetoric, he did not object to rhetoric *per se*. While he objected to Aristotelian logic, he called his own method a "kind of logic," ("The Plan of the Work," *PW* 249). There was an anti-Ciceronian element to his rhetoric, but he was capable of producing prose as balanced and figured as anything Cicero could have imagined. And

his essays employ an innovative structure that is unlike any other existing prose form. However, many of these contradictions may be somewhat diminished if Bacon is understood within the context of Stoic humanism, which emphasized, as Bouwsma says, the “divine, harmonious, and intelligible order of nature” (17). Bacon’s aim was not to destroy rhetoric, but to situate it within a more comprehensive intellectual edifice that was founded upon a clearer understanding between the nature of the mind and the nature of things. Stoicism, which was a comprehensive and synthetic philosophy, provides a model for just such a plan. Bacon adopts a number of elements of Stoic linguistic philosophy, some related to style, but others related to the relationship between words and things and between words and the mind. Finally, Stoic skepticism allowed Bacon to occupy a middle position between early Renaissance rhetoric, which accepted the possibility that language could be a force for positive change and the more radical skepticism of those who came after him.

Bacon’s Rhetorical Theories and Practice

Bacon’s theories about rhetoric¹⁰⁰ and its relationship to other arts and sciences continue to evoke much debate,¹⁰¹ as do questions about the antecedents for his linguistic

¹⁰⁰ See R. F. Jones, *Ancients and Moderns: A Study of the Rise of the Scientific Movement in Seventeenth Century England*, for an extended discussion of Bacon’s “plain style.” See also Brian Vickers, *Francis Bacon and Renaissance Prose* 232-261, for a review of Bacon’s influence on Renaissance rhetoric. See James Zappen, “Francis Bacon and the Historiography of Scientific Rhetoric” for a thorough but concise review of literature on Bacon and scientific discourse. See also Robert Adolph, *The Rise of Modern Prose Style* 26-77, for a discussion of Bacon’s contribution to modern scientific prose. See the first chapter of Robert Stillman’s *The New Philosophy and Universal Languages in Seventeenth-Century England: Bacon, Hobbes, and Wilkins* for a discussion of Bacon’s views on the gap between *res* and *verba*. For a contrasting view, see Timothy Reiss *The Discourse of Modernism*.

¹⁰¹ In *Francis Bacon and the Art of Discourse*, Lisa Jardine argues that Bacon “subordinates rhetoric to dialectic and characterizes rhetoric as something overlaid upon discourse composed according to dialectical rules” (14). By contrast, Brian Vickers argues in “Bacon and Rhetoric,” that “logic and rhetoric constituted a joint training in thinking, arguing, and expressing arguments in persuasive form” (209). The notion that Bacon’s influence was largely on the development of science is also questioned. In *Francis Bacon and Renaissance Prose*, Vickers argues that Bacon’s “dominance on seventeenth century thought” is not a result of his scientific program, but of “the terms in which it was formulated and the imaginative eloquence with which these were transmitted (232). The most comprehensive study of Bacon’s linguistic philosophy is

philosophy.¹⁰² Assessments of the influence of Bacon's rhetoric on subsequent discursive practices are almost as varied and discordant as those of his antecedents. Richard Foster Jones has described Bacon's contribution to the intellectual life of the seventeenth century as a rejection of ancient learning and the ornate language of the humanists, and a turn to nature as a source of truth. He characterizes Bacon's views on language as an attempt to develop a "clear, accurate, plain style" that resisted "interposing . . . any possible obstruction between observation and description" ("Science and English Prose Style" 77). Jones argues that Bacon's ideas influenced seventeenth century "scientists" to claim that ancient philosophy "was merely verbal, with no counterpart in reality," and "to consider a reformation in language and style as essential as one in science, to formulate their linguistic and stylistic ideals, and to try to make them operative" (*Ancients and Moderns* 49). Jones also argues that Bacon proposed a utilitarian science, perhaps because he had been "deeply impressed with the wretched condition of the human race, and cherished the hope that out of the marriage of mind and things there might spring 'a line and race of inventions that may in some degree subdue and overcome the necessities and miseries of humanity'" (60). While Jones's reductionist view of Bacon's rhetoric is consistent with the modernist narrative of the scientific revolution, his perception regarding Bacon's utilitarianism contradicts the notion that it amounted to a rejection of humanism, which valued highly the individual's contribution to society. More recent scholars have come to question the reductionist nature of this view of the origins of

found in Karl Wallace's *Francis Bacon on Communication and Rhetoric*.

¹⁰² In *Francis Bacon and Renaissance Prose*, Vickers suggests that Bacon is influenced by Plato. John Briggs, in *Francis Bacon and the Rhetoric of Nature*, has also suggested that Bacon's view of rhetoric was in the Platonic tradition, which subjected rhetoric not to dialectic but to ethics. A rather different view suggests that Bacon follows, more or less, in the Aristotelian tradition, viewing rhetoric as equal to dialectic, as a much fuller art which includes all the canons from invention to delivery. In "Attic Prose: Lipsius, Montaigne, Bacon," Morris Croll suggests that Bacon relied heavily upon Aristotle ("Attic Prose"). James Stephens, in "Bacon's New English Rhetoric and the Debt to Aristotle" argues that Bacon returns to Aristotle's view of rhetoric in order to "take a step forward by going back to the source," and suggests that Bacon attacks the Ciceronians and Senecans in much the same way that Aristotle faults the Sophists for "fostering a 'delicate and polished' kind of learning" (248).

modern science and have called into question such representations of the discursive practices of natural philosophers which do not consider the complexity of the cultural context within which the scientific revolution took place.

In *The Material Word*, Morris Kroll challenges the notion that seventeenth-century natural philosophers were able to achieve a degree of transparency in language. He disagrees with Jones's notion

that the scientific world view produced an ideology that treated language as transparent or referential—as an instrument, that is, to an unmediated cognitive and experimental grasp of objects in the world. When neoclassical authors talk about the ‘plain style,’ they do not advertise what Jones and later scholars in his tradition associate with ‘scientific’ neutrality or self-evidence. (4)

Kroll argues that Jones's thesis is a product of a modernist “narrative of progress” and that it provides him with “scientific” ground from which to survey the “marshy territory of rhetoric” (5). Ultimately, Kroll contends that, while such descriptions of the relationship between science and language have some merit, Jones's insistence on the transparency of scientific language “fails to recognize that the rhetoric of the materials that supplies its evidence constitutes a substantive claim in itself” (2). He argues that early modern philosophers, rather than rejecting the rhetorical practices of the humanists, advocated an “ideology of contingency” that constituted “a defense of the rhetorical or symbolic nature of human culture” (186). In other words, despite the professions of their authors to the contrary, the texts of the scientific revolution are themselves rhetorical in nature and are part of the rhetorical context of the Renaissance and early modern periods.

Kroll's argument and others like it risk being as reductionist as Jones's theory. Robert Stillman has argued that both these readings of early modern natural philosophy, which he calls the “anti-rhetorical” stance of Jones and the “ideological” stance of Kroll,

fail to address the issue of textual contradictions. These contradictions must be accounted for because they are symptomatic of an age “in which the opposition between the literal and figural underlies so many polarities of discourse (the divide between truth and falsehood, reason and imagination, philosophical discourse and rhetoric)” (“Assessing the Revolution” 105). It is necessary to take seriously early-modern concerns regarding language. There is no question that Bacon, like many of his peers, was greatly concerned about the degree to which human language could be trusted as a reliable means of representing truth and an acceptable means of communication.¹⁰³ But, as Stillman points out, even the most radical new philosophers of the early modern period continued to produce texts, and many of those texts deployed the rhetorical strategies that were taught in the humanist educational system in which they studied. The notion that Bacon was anti-rhetorical and anti-humanistic is an extreme representation of his views and one that does not take into consideration either his humanist values or the rhetorical strategies by which he justifies his turn to natural philosophy. This debate is not the kind of disputatiousness for its own sake that Bacon deplored among the scholastic philosophers of his day; uncertainty about his view of rhetoric and philosophy is justifiable. Bacon produced no handbooks, either of rhetoric or dialectic, though he discusses both logic and rhetoric in *The Advancement of Learning* and *De augmentis scientiarum*, and he calls the art of the “interpretation of Nature,” which he introduced in *Novum organum*, a “kind of logic” (*PW* 275). For Bacon, both logic and rhetoric, as practiced during the Middle Ages and Renaissance, were significant obstacles to learning. According to Bacon’s narrative regarding the emphasis on rhetoric during the Renaissance, the humanist fascination with ancient texts and rhetoric was a result of the Protestant reformation when

¹⁰³ Debates about the reliability of language continued for some time. During the early modern period the anti-language attitudes of natural philosophers became so extreme that Jonathan Swift satirized them in *Gulliver’s Travels*. He described a group of roving philosophers who so mistrusted language that they traveled from place to place leading heavily-burdened asses and “conversed” solely by displaying the “things” that they carried.

Martin Luther, “being no ways aided by the opinions of his own time was forced to awake all antiquity, and to call former times to his succors to make a party against the present time, so that the ancient authors, both in divinity and in humanity, which had long time slept in libraries, began generally to be read and revolved” (*Adv.*, *PW* 54).¹⁰⁴ From this grew “a delight in their manner of style and phrase, and an admiration of that kind of writing” which by Bacon’s time had led men to “study words and not matter” (*Adv.*, *PW* 54). Even more serious, in Bacon’s view, was the contentious learning of Scholastic deductive logic in which genuine inquiry had degenerated into unproductive disputatiousness, “like so many substances in nature which are solid do putrefy and corrupt into worms, so it is the property of good and sound knowledge to putrefy and dissolve into a number of subtile, idle, unwholesome, and (as I may term them) vermiculate questions” (*Adv.*, *PW* 55). Bacon’s complaint regarding dialectic is essentially the same as for rhetoric—that it does not focus on things but takes itself as its subject matter. The result of this inappropriate focus is that dialectic “brings forth indeed cobwebs of learning, admirable for the fineness of thread and work, but of no substance or profit” (*Adv.*, *PW* 55).

Stillman has described how the many uncertainties of the period—religious and political, as well as linguistic—opened up a gap between *res* and *verba* (between words and things) that traditional humanists, who had too much invested in “the persuasive power of the word,” were unable to address (*New Philosophy* 30). He argues that Bacon was uniquely effective in exploiting that breach in order to advance the claims of a new, culturally superior form of knowledge:

Into the breach between words and things opened by repeated challenges to the humanist rhetorical tradition, Bacon inserted the new logic of

¹⁰⁴ This narrative does not, of course, correspond with the nineteenth- and twentieth-century narrative of humanism in which Italian humanists, beginning with Petrarch, were responsible for reviving the interest in ancient texts.

natural philosophy—a logic aimed at illuminating things not words

Armed with a new organon, Bacon sought to transfer the status of cultural preeminence from oratory, poetry, and disputatious philosophy to natural philosophy. (30).

This “transfer of cultural preeminence,” more accurately describes Bacon’s contribution than Jones’s suggestion that he sought to destroy rhetoric and humanism or Kroll’s argument that the rejection of rhetoric was merely a pose. William Bouwsma’s notion of Stoic humanism as one of two foci of Renaissance humanism provides a framework within which to understand Bacon’s justification for this transfer of cultural preeminence. Because it offered a model for a synthetic intellectual framework, Stoicism provides the means by which Bacon was able, not to do away with rhetoric and logic, but to resituate them within a larger, integrated structure. Stoicism, as the hellenistic synthesis of hellenic philosophies is a more likely antecedent for Bacon’s reformulation of these arts, reflecting the eclectic character that has been previously noted. While both his rhetorical and linguistic theories also reflect elements of Stoic linguistic philosophy, it is his style that most clearly demonstrates the unmistakable influence of the Stoics.

Renaissance Rhetoric and Style

Modernist histories of rhetoric have suggested that by the end of the Renaissance, the art of rhetoric — which in Aristotle’s day comprised the five canons of invention, arrangement, memory, style, and delivery — had declined to the point that it comprised merely the canon of style. Peter Ramus, who authored widely used textbooks on both dialectic and rhetoric and who was among the most influential opponents of rhetoric, was largely responsible for removing from the art of rhetoric any significant epistemological function, essentially reducing it to an art of style.¹⁰⁵ Ramus was primarily concerned with

¹⁰⁵ The definitive work on Ramus is Walter Ong’s *Ramus: Method and the Decay of Dialogue*. Ong’s work

sorting out the intellectual tradition he had inherited, and his most significant contribution is his *Dialectic* or system of logic that is, in Ong's estimation, "of little interest to a serious logician" (7). It had the advantage, however, of reducing dialectic to a simple schematic device that could be used by virtually anyone, even the thousands of schoolboys to whom it was taught. It is clear that Ramus saw himself as a great educational reformer whose goal was to root out errors that he believed had persisted virtually since the time of Aristotle.¹⁰⁶ Despite these lofty claims, Ramus's contribution was more pedagogical than philosophical, and consisted in reducing and standardizing the various arts that were part of the curriculum so that there was little or no redundancy among them (Conley 128). In parceling out the intellectual functions of rhetoric and dialectic, Ramus, who believed that invention and arrangement were part of judgment, assigned those rhetorical canons to dialectic, leaving to rhetoric the ornamental aspects of style and delivery. He defined dialectic as "the art of speaking decisively on matters in doubt" (Conley 129) and felt it should apply only strict syllogistic reasoning. Dialectic yields, not probable, but certain conclusions:

For Ramus, the aim of dialectic is the truth, *ratio* . . . Ramus' commitment is to certain truth arrived at (as in Plato and Boethius) by dialectical invention and set out according to the "natural method," arranging ideas in descending order of generality. Rhetoric is simply the vehicle for the transmission of this truth to an audience unprepared to accept it. (Conley 130)

on Ramus may have exerted more influence on the history of Renaissance rhetoric than the works of Ramus exerted on the practice of Renaissance rhetoric. I have relied also on Conley's succinct analysis of Ramus's work and influence (Rhetoric in the European Tradition 127-133). The claims regarding Ramus's influence are based largely upon the great number of editions of his textbooks on rhetoric and dialectic.

¹⁰⁶ One of his earliest works was *Aristotelica animadversiones* (Remarks on Aristotle), often translated *Against Aristotle*, which was essentially a diatribe against Aristotle's philosophy and its influence in the Renaissance.

For Ramus, rhetoric was merely a necessary evil, designed to “serve no other purpose but to lead the vexatious and mulish auditor” (qtd. in Conley 130). Nevertheless, Ramus’s *Rhetorica* was very popular, most likely because of its schematic nature, which made it easy to understand and relatively simple to use. What is perhaps most important about Ramus’ realignment of rhetoric and dialectic was that it promised a kind of epistemological certainty that traditional rhetoric could not. At the same time, it diminished the possibility of negotiating differences in contingent situations since, according to Ramus’ schema, such situations did not exist. While Ramus, who seems to have been genuinely anti-humanistic, may have dismissed rhetoric as “mere” style, many of his contemporaries viewed it quite differently.

It is difficult to overestimate the importance of rhetoric in the public life of the Renaissance.¹⁰⁷ Not only was rhetorical training necessary for personal advancement at court, it was a critical component in the emerging forms of government as well. The successful courtier was expected to have a ready wit, to demonstrate *sprezzatura*, a mixture of cleverness and grace, in both written and oral discourse;¹⁰⁸ the successful public servant required a degree of oratorical competence to engage in public debates about civic matters. However, centuries-old arguments about the province and ethics of rhetoric continued much the same as they had in the past and were intensified by the replacement of the lingua franca Latin with vernacular languages and the emergence of new forms of government. For example, on the continent, outside of the new nation states

¹⁰⁷ There is a significant body of literature on Renaissance rhetoric. For an overview, see Thomas Conley, *Rhetoric in the European Tradition*. For an anthology of pertinent issues, see James Murphy, *Renaissance Eloquence*. Wayne Rebhorn has examined contrasting views of rhetoric during the Renaissance in *Renaissance Debates on Rhetoric*. For rhetorical practice in England, see W. S. Howell, *Logic and Rhetoric in England: 1500 to 1700*. See also, Peter Mack, *Elizabethan Rhetoric*. For the relationship between rhetoric and dialectic, see Peter Mack, *Renaissance Argument: Valla and Agricola in the Traditions of Rhetoric and Dialectic*.

¹⁰⁸ For a discussion of the role of rhetoric in the creation of the Renaissance courtier, see Stephen Greenblatt’s *Renaissance Self-Fashioning*. See also George Kennedy’s discussion of *sprezzatura* in *Classical Rhetoric and its Christian and Secular Tradition from Ancient to Modern Times*.

of Italy, absolute monarchies continued to rule, while in England, the Parliament persisted in its efforts to wrest power incrementally from the crown. Thus, while rhetoric was a primary focus of Renaissance humanism, there is no question that as the cultural anxieties of the period multiplied, it came under the same kinds of scrutiny as did most other aspects of the culture.

One way of viewing Renaissance rhetoric is as the evolution of style, particularly to the degree that it was associated with the humanist shift in emphasis from logic to textual analysis. The earliest focus for Renaissance rhetoric, a response to the recovery of ancient texts, was on an imitation of ancient eloquence in Latin, which remained the lingua franca throughout Europe well after the fall of the Roman empire.¹⁰⁹ The protohumanist Petrarch, who was perhaps better known in his own time for his annotations of classical authors than for the sonnets which form the basis of his modern reputation, lamented the deterioration of Latin style that had occurred during the Middle Ages and consciously imitated both Augustine and Seneca in both his prose and poetry. As the age progressed and more of Cicero's works were recovered and disseminated, his balanced periodic style, which was rich in tropes and figures, became the standard for eloquence. By the second half of the fifteenth century, some writers imitated Ciceronian style so slavishly that they refused to use any word form that could not be found in the works of Cicero.¹¹⁰ The resulting backlash against Ciceronian eloquence has subsequently been named the anti-Ciceronian movement, and Bacon has often been considered a part of that movement. The emphasis on eloquence was not, however,

¹⁰⁹ For a brief discussion of the eloquence in the Renaissance, see Elaine Fantham's entry on "Eloquence" and Jean Dietz Moss's entry on "Rhetoric in Renaissance Language and Literature" in *The Encyclopedia of Rhetoric*. See also the chapters on Renaissance rhetoric in Thomas Conley's *Rhetoric in the European Tradition*.

¹¹⁰ Erasmus, the great Dutch preacher, rhetorician, and author of handbooks on the arts of letter writing and preaching, composed a dialogue, *Ciceronianus*, critical of such slavish devotion to stylistic imitation. For a comprehensive discussion of the debates between the Ciceronians and anti-Ciceronians, see "Part I: History of the Controversies" in Izora Scott's English language edition of *Ciceronianus*.

confined to the use of Latin, but was extended to the vulgar languages as they began to be used for more sophisticated intellectual activities. In England, this concern with style in vernacular rhetoric is evident in the works of Henry Peacham (*The Garden of Eloquence*, 1577) and George Puttenham (*The Arte of English Poesie*, 1589). The ornamental English style reached its zenith in the works of John Lyly (*Euphues, Anatomy of a Wit*, 1578, and *Euphues and his England*, 1580). For many, the euphuistic style came to represent the worst stylistic excesses. The plain style of the early modern period has largely been seen as a rejection of euphuistic excess.¹¹¹ The perception that Renaissance rhetoric is primarily concerned with “mere” style, however, belies the complexity of the rhetorical landscape of the Renaissance in general, and, in particular, the breadth of meaning associated with the concept of style.

Eloquence, Prudence, and Practical Knowledge

Histories of rhetoric that have portrayed Renaissance style as mere ornamentation have helped to obscure the nature of the early humanists’ beliefs about the possibility of language to represent reality and to effect change in human affairs. For the humanists, style was not mere decoration, but was related to the belief in the possibility of language to represent shades of meaning, as well as to be a subtle marker of character. The textbook *De copia*, by Erasmus, the widely known Dutch preacher and rhetorical theory, demonstrates the ways in which a single phrase may be transmuted to convey more or less subtle shades of meaning. Eloquence, i.e., facility with style, was seen as a marker of character. In her discussion of Renaissance humanism, Hanna Gray explores the centrality of eloquence in both educational practice and in civic humanism. Gray seeks to account for the shift from the scholastics’ concern with logic and metaphysics to an

¹¹¹ Bouwsma would likely argue that the history of Renaissance rhetoric is not a move from Ciceronian rhetoric to plain style since the Senecan or Stoic influence existed throughout the Renaissance. See *The Two Faces of Renaissance Humanism*.

emphasis on the methods of rhetoric in terms of a shift in values and changing notions about the ends of knowledge and debate. For the Renaissance humanist, the goal of education was to equip the individual to lead a good life, and “the function of knowledge was not merely to demonstrate the truth of given precepts, but also to impel people toward their acceptance and application” (500). The common bond among humanists, according to Gray, is their interest in eloquence, which “endowed the precept with life, immediacy and persuasive effect, and which stimulated a man’s will as well as informing his reason” (500-1). Their understanding of eloquence was grounded in the traditions of classical rhetoric which provided “a body of precepts for the effective communication of ideas and, equally important, with a set of principles which asserted the central role of rhetorical skill and achievement in human affairs” (498). For the Renaissance humanists, true eloquence, as opposed to sophistry, arose from “a harmonious union between wisdom and style; its aim was to guide men toward virtue and worthwhile goals, not to mislead them for vicious or trivial purposes” (498). In contrasting rhetoric to logic, ethics to metaphysics, literature to natural philosophy, and education to epistemology, the humanists were “contrasting a general and practical culture to the professional and academic activities and attitudes” of scholasticism (501). These humanist activities were grounded in assumptions about the relative importance of the *vita activa* as opposed to the *vita contempliva*, “the conviction that knowledge should serve practical ends, that human learning ought to have utility for human life, that education should instruct both the will and the intellect, and that in persuasion and eloquent discussion lie the effective means of conveying truth” (505). In an age as fraught with uncertainty as the Renaissance, the art of rhetoric was perhaps more essential than that of logic and metaphysics since, from ancient times, the function of rhetoric was “to argue over matters which presented alternative possibilities, problems about which different points of view could be maintained, questions open to debate because they could be judged only in

terms of probable truth and were not susceptible to scientific demonstrations of irrefutable validity” (505).

Within the liberal arts tradition, eloquence was not merely facility with language, but an indicator of character as well. Janet Atwill summarizes the relationship between a liberal arts education and humanism in terms of the inculcation of values:

Historically, the aim of a liberal arts education, in the most general terms, has been to inculcate a set of cultural values through texts and traditions believed to exemplify those values. In other words, the purpose of such an education has been to pass on “culture” — to transmit the values, practices, and institutions a culture believes to be its fabric and framework. The product of such an education would be the individual, a kind of normative subject, whose values and expectations conformed to those of the exemplars and traditions protected by the liberal arts. (1)

Central to humanism is the study of rhetoric, particularly rhetoric in the Roman tradition of Cicero and Quintilian, in which the ideal practice is the ‘good man speaking well’ (*vir bonus dicendi peritus*).¹¹² This belief in eloquence as a marker of character was a crucial element of Renaissance humanism, as the centrality of rhetoric in the curriculum suggests.

Bacon and Stoic Style

Bacon was considered an extraordinary orator in an age in which virtually all members of the upper and middle classes had some rhetorical training.¹¹³ However, his

¹¹² The critical intersection between virtue and eloquence had been a commonplace since Cicero. See Atwill’s discussion in *Rhetoric Reclaimed*, 29-46. Recently, scholars have suggested that the “*vir bonus*,” which comes from Quintilian, is based on the Stoic concept of the wise man or sage. See Arthur Walzer, “Quintilian’s ‘Vir Bonus’ and the Stoic Wise Man.”

¹¹³ In his essay “*Grammatica Movet*,” Lawrence Green argues that even those who did not receive university training in rhetoric and its history were introduced to the elements of rhetorical style through their training in grammar. The Latin grammar books that were prominent throughout the era included

rhetorical practice was not of a piece with the ornate, euphuistic rhetoric of some of his contemporaries. As the excerpt from Ben Jonson's *Timber* at the beginning of this chapter suggests, Bacon's rhetoric was not valued merely for its aesthetic aspects, but for its "gravity," its neatness, and its lack of idleness and emptiness. Jonson, who himself greatly admired the style of the Stoics,¹¹⁴ emphasized, too, the conciseness of his speech, which apparently was so tightly argued that his auditors could not "cough or looke aside from him without loss" (26). It is clear that Bacon's concern with language and discourse was not limited to his public oratorical performances, but is central to his philosophical project as well. He recognized that internal communication of the new philosophy among its practitioners was as critical to its advancement as was the external communication of these findings to a larger audience. He also believed that communication among the initiates was qualitatively different from communication with external audiences. While it was not uncommon for rhetorical theorists to make distinctions among various audiences and purposes, Bacon broadened his discursive theory to include uses of language that were not, in his view, primarily persuasive.

There is no question that Bacon's most direct indebtedness to the Stoics is stylistic.¹¹⁵ During the early part of this century, Morris Croll produced several studies arguing that several seventeenth-century writers—particularly Montaigne, Lipsius, and

extensive examples of the rhetorical tropes and figures. See also Peter Mack's chapter on "Rhetoric in the Grammar School" in *Elizabethan Rhetoric*.

¹¹⁴ See Robert C. Evans, *Jonson, Lipsius and the Politics of Renaissance Stoicism*, for an analysis of Jonson's appreciation of Stoic style and philosophy; see also Robert Adolph, *The Rise of Modern Prose Style*, who notes that "Jonson's famous praise of Bacon was adapted from a passage in Seneca the Elder (165)."

¹¹⁵ The secondary literature on Baconian style is extensive and the debate is not without heat. See Croll, "'Attic Prose' in the Seventeenth Century," "Attic Prose: Lipsius, Montaigne, Bacon," and "The Baroque Style in Prose," as well as the anthology *Style, Rhythm, and Essays*. George Williamson seconded Croll's argument in *The Senecan Amble* and "Senecan Style in the Seventeenth Century." Brian Vickers rejects the argument in *Francis Bacon and Renaissance Prose*; as does Robert Adolf in *The Rise of Modern Prose Style*. The heat of the argument is not related to the question of Stoic influence on the style of Bacon and the others, but to the characterization of them as anti-Ciceronian. See also Stanley Fish, "Georgics of the Mind: The Experience of Bacon's Essays"; and A. C. Howell, "Res et Verba: Words and Things."

Bacon—imitate the style of the Stoics Tacitus, Seneca, and Marcus Aurelius. Croll places these writers within the anti-Ciceronian movement, and delineates the distinctions between the “oratorical” style, “invented” by the Sophist Gorgias and elaborated by Isocrates, and the plainer “essay” style of the Stoic writers. The oratorical style was “distinguished by the use of *schemata verborum*, or ‘schemes,’ as we might call them, which are chiefly similarities or repetitions of sound used as purely sensuous devices to give pleasure or aid the attention” (“Attic Prose’ in the Seventeenth Century” 54). The essay style lacks these figures, relying instead upon *figurae sententiae*, “the figures of wit or thought” (54). The Stoics, in particular, valued the figure antithesis. During the Renaissance and early modern periods, the Ciceronian movement reached its zenith in the euphuistic style of John Lyly. Ciceronian style was further characterized by long, balanced sentences, the phrases and sentences of which were fully connected to one another, in contrast to the shorter, disconnected sentences of the essay style.

The Stoics followed Aristotle in being concerned with the rhetorical qualities of clarity, brevity, and appropriateness. Croll argues that the Stoics devalued clarity, i.e., “the exposition of objective reality, as in the statement of the facts and laws of natural science” (85) because the kind of “truth” they wanted to expose was

moral and inward. . . a reality not visible to the eye, but veiled from common observation; hidden in a shrine toward which one might win his way, through a jostling, noisy mob of illusory appearances, by a series of partial initiations. This kind of reality can never be quite portrayed, of course, because ultimate knowledge of the mystery of truth is never attained. But it is at least possible to depict the effort of the athletic and disciplined mind in its progress toward the unattainable goal. And this effort of the mind was the characteristic theme of the Stoics, and the object of their rhetorical art. Though by the rigor of their theory they were bound

to a cold passionless objectivity, they really aimed at a highly imaginative portrayal of their relations with truth; and even those who professed to strive for clearness, and in fact did so, could not resist the temptation to convey the ardor of their souls in brevities, suppression, and contortions of style which are in fact inconsistent with a primary devotion to the virtue of perspicuity. (85-86)

Bacon expressed similar concerns about the virtue of clarity, or seeming clarity. The truth that Bacon wished to expose was not moral and inward, but the truth of “things” or nature, which he felt was obscured by language. When knowledge was delivered in the form of continuous discourse (what he called Methods) i.e., in the way “best to be believed,” he claimed that there resulted “a kind of contract of error between the deliverer and the receiver” because the deliverer does not reveal the way in which the knowledge was acquired, nor does the receiver find it necessary to inquire (*De aug.*, *PW* 530). He preferred the cryptic, aphoristic style of the Stoics because it forced the auditor to try to assemble or add to the “broken” or incomplete knowledge that existed in his time.

Brevity, according to Croll, is the virtue the Stoics most admired as a quality “almost necessarily involved in the attempt to portray exactly the immediate motions of the mind” (87). He suggests that throughout history,

those which have aimed at the expression of individual experience have tended to break up the long musical periods of public discourse into short, incisive members, connected with each other by only the slightest of ligatures, each one carrying a stronger emphasis, conveying a sharper meaning than it would have if it were more strictly subordinated to the general effect of the whole period. Such a style is a protest against easy knowledge and the complacent acceptance of appearances. (“Attic Prose” 87)

This affection for brevity is evidenced in the Stoic affection for *sententiae*, an affection which Bacon shared. He found a number of virtues associated with *sententiae*, or aphorisms:

[B]ut that other delivery by aphorisms has many excellent virtues whereto the methodical delivery does not attain. First it tries the writer, whether he be light and superficial in his knowledge, or solid. For aphorisms, not to be ridiculous, must be made out of the pith and heart of sciences. For illustrations and excursion are cut off; variety of examples is cut off; deduction and connexion are cut off; descriptions of practice are cut off; so there is nothing left to make the aphorisms of but some good quantity of observation. And therefore a man will not be equal to the writing in aphorisms, nor indeed will he think of doing so, unless he feel that he is amply and solidly furnished for the work. (*De aug.*, *PW* 531)

The virtue of appropriateness is, according to Croll, the most puzzling of the Stoic virtues of style. Appropriateness, for the Stoics, had two aspects, appropriateness as to thing and person. Appropriateness to thing was simply defined, although that definition perhaps opens up whole avenues of disagreement. Lipsius, writing about Stoic style in the late sixteenth century, suggests that appropriateness to thing meant that “everything is said for the sake of the argument” and that “the vesture of sentence and phrase exactly fits the body of the thing described” (qtd. in Croll, “Attic Prose” 88). Appropriateness to person was related to appropriateness to audience as well as to the speaker. Here Croll contrasts Stoic rhetoric to Aristotelian rhetoric that places primary emphasis upon the appropriateness of discourse to the audience. For the Stoics, however, primary importance was placed on the “exact interpretation in one’s expression of the mode of one’s thought” (89). This, again, is related to the goal of style as the presentation of the action of the mind of the speaker.

The secrets of nature are made known only to attentive and collected minds, prepared by a long preliminary training in habits of exclusion and rejection; and even to them but partially, and in moments of rare illumination. A style appropriate to the mind of the speaker, therefore, is one that portrays the process of acquiring the truth rather than the secure possession of it, and expresses ideas not only with clearness and brevity, but also with the ardor in which they were first conceived. (89)

Thus, Croll argues, Stoic rhetoric must be characterized not by the sensuous schemes of oratory, but the “figures of wit,” chief of which were antithesis, “as a means of expressing striking and unforeseen relations between the objects of thought” (90) and points (*argutiae*). These two figures are the primary means employed in condensation of argumentation in sententiae and aphorism (89-90).

Colish notes that Stoic literary style is based on the notion that language is a natural sign. For the Stoics, a work must be mimetic and must conform to nature and to truth, lest it “distort the natural function of language” (I:58). The same holds true for rhetoric, according to Colish:

In the realm of rhetoric the Stoics elaborate five basic canons of style: purity of language; clarity and distinctness; conciseness, even tending toward paratactic constructions; the avoidance of inaccuracy, colloquialism, barbarism, and solecism; and appropriateness of style. Appropriateness of style means its appropriateness to the subject matter, in the light of which the speaker should select his figures and should decide whether to employ high, middle, or low style. (I:59)

Colish argues that in Stoic literary theory, there is no need to consider the ethos of the audience in selecting style because the speaker addresses the audience’s logos which is the same for all. She recognizes the irony that the Roman Stoics, who were not

particularly interested in speculating about physical correlatives to logic and ethics created “the most eloquent literary expression to a theory of style in which the *logos* of physics and the *logos* of ethics are so integrally related with the *logos* of language” (I:60). Certainly, it seems to be the case that Bacon’s concept of language attempted a similarly comprehensive, integrated system, although the impetus for Bacon was to create a wholistic system that could complement the deficiencies of language itself.

Bacon’s preference for *sententiae* and aphorisms is related to the Stoic preference for brevity. Perhaps the greatest correspondence between Stoic linguistic philosophy and Bacon’s is the sense of the important connection between the cognitive process and its expression:

But knowledge that is to be delivered to others as a thread to be spun on ought to be insinuated (if it were possible) in the same method wherein it was originally invented. And this indeed is possible in knowledge gained by induction; but in this same anticipated and premature knowledge (which is in use) a man cannot easily say how he came to knowledge which he has obtained. Yet certainly it is possible for a man in a greater or less degree to revisit his own knowledge and trace over again both the footsteps of his cognition and consent; and by that means to transplant it into another mind just as it grew in his own. (*De aug. PW* 530).

Bacon’s description of language which reflects the process through which knowledge was obtained is remarkably similar to Seneca’s advice in response to Lucullus’s criticism of a philosopher’s style:

Suppose, now, that your statement is true—that he pours forth rather than places his words; let me however, tell you at the start that this trait of which you speak has a peculiar charm, and that it is a grace appropriate to a smoothly-gliding style. For I maintain, it matters a great deal whether it

tumbles forth or flows along. . . . Fabianus seems to me to have not so much an “efflux” as a “flow” of words; so copious is it, without confusion, and yet not without speed. This is indeed what his style declares and announces—that he has not spent a long time in working the matter over and twisting it into shape. . . . the man was building up character rather than words, and was writing those words for the mind rather than for the ear. . . . But certainly whenever I heard him lecture such did his work seem to me—not solid but full, the kind which would inspire young men of promise and rouse their ambition to become like him, without making them hopeless of surpassing him (*Epistles III*, C.8, 12)

For Seneca, the artfully crafted language of the Ciceronians diminished the direct impact of the speaker upon the audience. In this passage, Seneca is concerned that the speaker’s character is able to be imitated by his auditors, whereas Bacon is concerned that the speaker’s knowledge-making process be what is imitated.

The Stoic emphasis on language as process is based, to a degree on their own perceived understanding of the gap between *verba* and *res* and the belief that things matter more than words, particularly in philosophical matters:

One should not, however, bestow very much attention upon mere words.
Let this be the kernel of my idea; let us say what we feel, and feel what we say; let speech harmonize with life. . . . Are you concerned about *words*?
Rejoice this instant if you can cope with *things*. (Seneca *Epistles II*, LXXV.4,8)

Style as Method in Bacon’s Works

Despite the apparently great differences between Bacon’s plain style and the copious rhetoric of the Renaissance humanists, they share certain fundamental

assumptions about the importance of style. Both believed that style was more than mere ornamentation. The fact that Bacon advocates a plain style for natural philosophy does not mean that style is unimportant. As Jeanne Fahnestock points out in her examination of *Rhetorical Figures in Science*, a plain style is a style nonetheless. Bacon's taxonomy of styles suggests, in fact, that Bacon related style to different kinds of mental effort just as he based his division of the sciences upon the faculties. In addition to a belief in the importance of style, Bacon also seems to share with the Renaissance humanists the assumption that reading is a prudent or deliberative act.

Bacon's new method, which purports to be a kind of inductive logic, is itself based on the rhetorical trope antithesis. Fahnestock argues that the rhetorical tropes act as organizing principles for ways of thinking. She calls them "epitomes of durable lines of argument" (40). Antithesis is one of the most fruitful of these tropes because setting one thing against the other in effect forces the auditor to make choices between them. Bacon's method, which he describes as "a process of exclusion and rejection" relies heavily on antithesis. He applies his method by compiling tables in which a given characteristic, such as heat or cold, is either present or absent. Fahnestock argues that Bacon's method is derived from rhetorical practice:

[F] or all his gesturing about departing from the methods of the ancients, [it] is still topical and, given the relation between the figures and the topics, it is essentially figural as well. In particular, Bacon demonstrates how existing or acceptable pairs of contraries, fitted into a syntactic frame, can invite the invention of new arguments and direct the search for new sources of evidence. Thus, it is possible to say that Bacon's empirical method of inquiry is in a sense figure-driven, and that given his epistemological commitment to the aphorism, he was predisposed to package both his arguments and his observations in epitomes such as the

antithesis. Far from turning his back on the rhetorical tradition, he in fact tapped its conceptual resources epitomized in the figures. (65)

Bacon would perhaps argue that the fact that his empirical method is figure-driven merely demonstrates the universality of his method. It is more likely, that it demonstrates the degree to which he was immersed in the rhetorical and textual practices of the humanists. However, there is no question that Bacon did resituate rhetoric within a larger and more complex framework, and one that draws heavily on Stoic linguistic philosophy.

Linguistic Theory

Bacon addresses matters of language in Book VI of *De augmentis*, in which he discusses the “Art of Transmission . . . or of producing and expressing to others those things which have been invented, judged, and laid up in the memory” (*PW* 521). The general Art of Transmission includes “all the arts which relate to words or discourse,” but he argues that “reason [is] the soul of discourse, yet in the handling of them reason and discourse should be kept separate” (521). He includes three divisions of the Art of Transmission: first, the Organ of Discourse, or Grammar, which he subdivides according to speech and writing and which is of two sorts, literary and philosophical; second, the Method of Discourse, or the Wisdom of Transmission, is divided into the “different kinds of methods [with] their advantages and disadvantages”; and third, “the Illustration of Discourse, which is the Art of Rhetoric” (521). This division differs from the traditional humanist curriculum in a number of ways. First, the humanist liberal arts tradition included grammar, rhetoric, and poetics, the last of which Bacon elevates to a much higher level according to his distribution of learning according to the faculties. Second, Bacon allots judgment to logic, or to his philosophical method, rather than to rhetoric. Finally, Bacon resituates rhetoric as a subordinate part of philosophy rather than valuing

it as an art equivalent to and sometimes more useful than philosophy as did the humanists.

Grammar, or the Organ of Discourse

Bacon begins his discussion of the Arts of Transmission with grammar, which he divides into two parts relating to speech and writing following Aristotle's dictum that "words are the image of thought and letters are the image of words" (521). However, he digresses with a discussion of what he calls the "Organ of Transmission" that, he says, "has other children besides Words and Letters" (521). These other children are hieroglyphics and pictographs, as well as human sign language. Bacon calls these "*real characters*, not nominal; characters, I mean, which represent neither letters nor words, but things and notions" (521-22). He calls these characters "Notes of Things" and says they are of two types: "*ex congrua* where the note has some congruity with the notion, the other *ad placitum*, where it is adopted and agreed upon at pleasure" (522). Bacon's recognition of a difference between characters that are "real, not nominal" and letters, as well as his differentiation of characters as congruent and conventional seems to be related to the distinction he makes between literary and philosophical grammar. Literary grammar is for the purpose of learning everyday languages more quickly and speaking them more purely and correctly (523). Philosophical grammar, however, ought to inquire regarding "the analogy between words and things, or reason" (523).

This notion that some aspects or types of language are more congruent with things than others is also reflected in Bacon's notion of an uncontaminated, prelapsarian language in which words and things were perfectly congruent. This prelapsarian language was made possible by "knowledge of nature, by the light whereof man discerned of every living creature, and imposed names according to their propriety" (*Filum labyrinthi*, *PW*

209).¹¹⁶ Bacon's view of a pure prelapsarian language is, of course, consistent with Christian theology, but it also conforms with Stoic view that language is a natural sign: "Language is sound; it is material and corporeal; and it has a direct and natural correlation with the physical realities which it signifies" (Colish I:56). Consequently, the Stoics spurned neologisms as linguistically less authentic than older words.

Bacon also follows the Stoics in several technical aspects of linguistic philosophy, which made distinctions among words, speech, and internal language. Although the Stoics are said to have made significant contributions to the traditional grammar that was transmitted from the Hellenistic period to the Middle Ages and Renaissance, there are no extant grammatical texts from the period. Blank and Atherton argue that Stoic grammatical theory must be derived from the various parts of dialectic. Grammatical theory regarding parts of speech, for example, are related to the subsection of dialectic concerned with "voice" while syntax was concerned with a different part of dialectic (314). Diogenes Laertius says that the Stoics distinguish between utterance and speech and between saying and voicing:

Utterance and speech are different, because vocal sound is also an utterance but only articulated sound is speech. And speech is different from language, because language is always significant, but speech can lack significance, e.g. *blituri*, whereas language is not so at all. Furthermore, saying is different from voicing. For utterances are voiced but it is states of affairs which are said—they, after all, are actually sayables. (Diogenes Laertius 7.57)

According to Diogenes Laertius, "Impression leads the way; then thought, which is able to speak, expresses in discourse what it experiences as a result of the impression" (Long

¹¹⁶ See Stillman's discussion of Bacon's views of an Adamic language in *New Philosophy and Universal Language* 98ff.

HP Vol. 1 33D). Discourse is made possible by that class of incorporeals, the sayables (*lekta*). Stoic linguistic philosophy is the first to recognize and elaborate upon the difference between linguistic and grammatical meaning, a difference which is based in the Stoic dichotomy between form and force. The Stoics made a distinction between the material aspects of language—which included both the thing to which a word referred and the word itself, or utterance—and its meaning, i.e., the idea the word denoted. A word must be associated with what the Stoics called a “movement of thought,” which they called a *lekta*, or sayable. Seneca describes the difference between words and *lekta* in this way:

There are [the Stoic says] bodily substances: for instance, this is a man, and this is a horse. These are accompanied by movements of thought which can make enunciations about bodies. These movements have a property peculiar to themselves, which is separate from bodies. For example, I see Cato walking: sense-perception has revealed this, and my mind has believed it. What I see is a body, and it is to a body that I have directed my eyes and mind. Then I say, “Cato is walking.” What I now utter (he says) is not a body, but a certain enunciation about a body, which some call a proposition, others a thing enunciated, and others a thing said. (*Letters* 117.13)

According to Sextus Empiricus, Stoics place the issue of truth within the sphere of what he calls “the signification.”

The Stoics defended the . . . opinion . . . that three things are linked together, “the signification”, “the signifier”, and “the name-bearer”. The signifier is an utterance, for instance “Dion”; the signification is the actual state of affairs revealed by an utterance, and which we apprehend as it subsists in accordance with our thoughts . . . ; the name-bearer is the

external object, for instance Dion himself. Of these, two are bodies—the utterance and the name-bearer; but one is incorporeal—the state of affairs signified and sayable, which is true or false. (*Against the Professors* 8.11-12)

It is on this theory that Stoic linguistic philosophy, which can be subdivided into grammar, dialectic (logic), and rhetoric, is based. Bacon's description of grammar and his anxiety about the gap between word and thing suggest that he shared a similar understanding of language.

Methods of Discourse

Though the early Stoics were concerned with speaking well, their rhetorical theory, at least until the late imperial period, seems relatively undeveloped. Diogenes Laertius says that for the Stoics, rhetoric is “the science of speaking well in regard to continuous discourses” (7.41 [*HP* 31A]). Plutarch also suggests that Stoic rhetoric, at least according to Chrysippus, was concerned with “continuous discourse and its arrangement,” and says that the speaker should be concerned not with appropriate speech but with delivery as well. However, he points out that Chrysippus later eschewed the use of many rhetorical figures and tropes. (*HP* 31H [*On Stoic self-contradictions* 1047 A-B]).

The second part of Bacon's *Art of Transmission*, which he calls “Methods of Discourse,” offers a unique typology of genres. Aristotle, for example, sorted rhetoric according to its purpose—epideictic, forensic, or deliberative—and also according to levels of style—high, middle, and low—which should be fitted to the occasion. Bacon classifies his types of discourse according to their auditors. The first pair, “Magistral” and “Initiative” discourse, are both related to learning: magistral aims to teach crowds of learners; Initiative attempts to spur the adept to seek deeper knowledge.

The magistral method teaches; the initiative intimates. The magistral requires that which is told should be believed; the initiative that it should be examined. The one transmits knowledge to the crowd of learners; the other to sons, as it were, of science. The end of the one is the use of knowledges, as they now are; of the other the continuation and further progression of them. (*De aug.*, *PW* 530).

A second pair, which Bacon says are related to Magistral and Initiative but “in reality almost contrary” are exoteric and acroamatic. These are intended to “separate the vulgar among the auditors from the select” (531). While he does not describe exoteric discourse except to say that it is the more open of the two, the intention of acroamatic discourse is “by obscurity of delivery to exclude the vulgar . . . from the secrets of knowledge, and to admit those only who have received the interpretation of the enigmas through the hands of teachers, or have wits of such sharpness and discernment as can pierce the veil” (531). It is likely that Bacon is referring here to hermetical texts, as well as some ancient texts.

A third pair is “methods” and “aphorisms”. Aphorisms are the short, pithy constructions that are often associated with Bacon’s writing. Ideally, they are the distillation of intense and prolonged observation (induction). The value of aphorisms is that they “represent only portions and, as it were fragment of knowledge, [and] invite others to contribute and add something in their turn” (531). In contrast, methods are continuous discourse, that is, compositions that include assertions with proof to back them up. Methods “many times carry a shot of I know not what excellent art, which if they were taken to pieces, separated, and stripped, would shrink to little or nothing . . . they [are] fit to win consent or belief, but of little use to give directions for practice” (531). Bacon suggests that these discursive methods ought only be used to “remove strong preoccupation's and prejudgments” (531-2). To summarize, then, magistral discourse and methods are used to obtain adherence or belief; initiative discourse and

aphorisms are used among “experts” to provide a structure for continuing investigation of natural history. Bacon uses both these discursive modes in his Great Instauration as a means of realizing his goals of commencing “a total reconstruction of sciences, arts, and all human knowledge” (*PW* 241). It is primarily because of these latter forms of discourse, which contrast so sharply with the copious rhetoric of his age, that Bacon is considered to be the father of modern discursive practices.

Bacon’s distinction between aphorisms and continuous discourse is one he shares with Stoic rhetorical theory. According to Plutarch, Chrysippus was opposed to the elaborate style that was focused on figures of speech:

He defines rhetoric as an expertise concerned with the order of continuous speech and its arrangement. Furthermore, in book I he has even written the following: “I think one should cultivate not just a frank and unaffected order but also, apart from the speech, the appropriate kinds of delivery in relation to the fitting tones of voice, facial expressions and gestures.” Yet after being so ambitious about speech here, he says again in the same book, when discussing hiatus, that we should not only ignore hiatus and stick to what is better, but we should also ignore various kinds of unclarity, ellipses and — in heaven’s name — solecisms, of which numerous others would be ashamed. (*On Stoic self-contradictions* 1047A-B)

The Stoic who is, perhaps, best known for his use of the aphorisms, or *sententiae*, is Tacitus, the Roman historian whom Bacon greatly admired.¹¹⁷ Patrick Sinclair, in his examination of the use of *sententiae* in the works of Tacitus and other Roman Stoics, examines how Seneca demonstrates the value of aphorisms (or precepts or *sententiae*) in an educational project. Seneca sets up a relationship between a philosopher/praeceptor who “attempts to elucidate the the occurrences of daily life and history in conformity

¹¹⁷ In “Attic Prose: Lipsius, Montaigne, Bacon,” Croll identifies Bacon’s style as Tacitean.

with general Stoic doctrine” (91), and a philosophical novice who needs instruction in the obligations of Stoic sapientia:

Seneca’s preceptor-student relationship in fact sets up a model that can illuminate important aspects of [the preceptor’s] use of sententiae to communicate his policies on particular issues and events, to instruct Roman citizens about the broader vision behind those policies, and to define the relation of the individual and the social orders to his government and to political life in general. For [the] sententiae do in fact comprise a political ‘*De rerum natura*’ in [the] narrative. (91)

This relationship between preceptor and student precisely mirrors Bacon’s use of aphorisms as the ideal form for philosophical communication, since they are the distilled essence of wisdom.

Rhetoric

Although Bacon found the humanist emphasis on texts and rhetoric to be one of the most serious deficiencies of learning, he did not dismiss rhetoric out of hand as Ramus did. While he recognized the propensity for speech to mislead, he also saw the need for an art of persuasion. Bacon ranked eloquence inferior to wisdom, but called it a “science both excellent in itself, and excellently laboured” (*Adv.*, *PW* 534-35). Following his division of learning according to the “faculties of the rational soul,” he allied rhetoric with the imagination: “Rhetoric is subservient to the imagination, as Logic is to the understanding; and the duty and office of Rhetoric, if it be deeply looked into, is no other than to apply and recommend the dictates of reason to imagination, in order to excite the appetite and will” (535). Rhetoric acts with logic and moral philosophy to strengthen reason: “For the end of logic is to teach a form of argument to secure reason, and not to entrap it; the end likewise of moral philosophy is to procure the affections to fight on the

side of reason, not to invade it; the end of rhetoric is to till the imagination with observations and images, to second reason and not to oppress it” (535). Bacon’s division of the faculties is like that of other Renaissance Stoics. According to A. H. T. Levi, the scholastic model of faculty psychology was based on Augustine’s introduction of the concept of *voluntas* or will. “The scholastics made the *voluntas*, together with the *intellectus* and the *memoria*, into ‘faculties’ of the soul, really distinct from the soul and from one another. Acts were specified by their objects, and faculties were specified by their acts. The acts of the *intellectus* were specified by the true, and those of the *voluntas* by the good” (93). The problem for the scholastics was how to account for acts that were both cognitive and volitive, e.g., an act of faith, or rational choice. Cognitive acts, because they refer to a standard of truth, could not be free; acts of the will, however, may be made without reference to the “truth.” According to Levi, Lipsius’s generation imported into the scholastic model of faculty psychology the Stoic doctrine that “the passions were based on or constituted false judgements [sic], and that the ‘ratio’ of the Stoics, necessarily right, because divine, had become in the scholastics subject to error” (94). This version of faculty psychology is compatible with Bacon’s description of the way rhetoric works as an assistant to reason to strengthen the will:

Rhetoric is subservient to the imagination, as Logic is to the understanding; and the duty and office of Rhetoric, if it be deeply looked into, is no other than to apply and recommend the dictates of reason to the imagination, in order to excite the appetite and will. For we see that the government of reason is assailed and disordered in three ways; either by the illaqueation of sophisms, which pertains to Logic; or by juggleries of words, which pertain to Rhetoric; or by the violence of the Passions, which pertains to Ethics. For as in negotiations with others men are usually wrought either by cunning or by importunity, or by vehemency; so

likewise in this negotiation within ourselves, we are either undermined by fallacies of arguments, or solicited and importuned by assiduity of impressions and observations, or agitated and transported by violence of passions. And yet the nature of men is not so unfortunately built, as that those arts and faculties should have power to disturb reason, and now power to strengthen or establish it; on the contrary they are of much more use that way. For the end of logic is to secure a form of reason, and not to entrap it; the end likewise of moral philosophy is to procure the affections to fight on the side of reason, and not to invade it; the end of rhetoric is to fill the imagination with observations and images, to second reason and not to oppress it. (*De aug.*, *PW* 535)

There are no Stoic rhetorical treatises extant, but Diogenes Laertius describes the differences between rhetoric and dialectic:

[T]he logical part is divided into two sciences, rhetoric and dialectic. . . . rhetoric since it deals with the art of speaking well in regard to continuous discourses; and dialectic, since it is the science of correct discussion in regard to discourses conducted by question and answer, so they also define it as the art of what is true and false and neither. (7.41-4)

According to Sextus Empiricus, Zeno of Citium described the difference between rhetoric and dialectic in terms of brevity and copiousness:

When Zeno of Citium was asked how dialectic differs from rhetoric, he clenched his fist and spread it out again, and said, “like this” — characterizing compactness and brevity as the hallmark of dialectic by the clenching, and hinting at the breadth of rhetorical ability through the outspread and extension of his fingers. (*HP* 31F)

There are echoes of both these notions of rhetoric in Bacon's Arts of Transmission, particularly in the notion that brevity is related to epistemology, while continuous discourse is related to persuasion.

James Stephens argues that Bacon follows Aristotle in describing rhetoric as a moral art and classifying it according to audience. However, Bacon corrects Aristotle in several significant areas, including the role of imagination and the inconsistency of Aristotelian logic. Perhaps most significantly, Stephens argues, Bacon "seeks to correct Aristotle's error in reducing style, the only function which rhetoric serves exclusively, to a 'minor' and 'vulgar' accessory. The only way to reform rhetoric is to grant the importance of style and then re-work it as a philosophical ornament which transcends mere ornament" (*Francis Bacon and the Style of Science* 249). Stephens identifies three doctrines that distinguish Bacon's approach to rhetoric from that of Aristotle: the psychology of discovery, which considers the relationship between audience and the content of scientific communication; his theory regarding the relationship between style and scientific method, which examines how human emotions are exploited "in the interest of reason;" and the doctrine of "literate experience," which explores the special relationship between rhetoric and philosophy (*Francis Bacon and the Style of Science* 56). Stephens has not, however, examined the importance of Stoicism as an influence on Bacon's "corrections" of Aristotle, a topic which remains relatively unexplored. Williamson and Croll, who have certainly catalogued the stylistic similarities between Bacon's prose and that of Stoic authors Seneca and Tacitus, have not gone much farther to demonstrate a connection between philosophy and rhetoric, either in Stoic or Baconian thought. Vickers and Robert Adolph have, in fact, rejected Croll's and Williamson's thesis regarding Bacon's imitation of Senecan or Tacitean prose style. In *Francis Bacon and Renaissance Prose*, Vickers argues essentially that Bacon borrows from many different styles and deploys his borrowings according to his own purposes. Thus, it is

inappropriate to limit him merely to Stoic style. Adolph argues that what appears to be Stoic in Bacon's style is a rather a reflection of Bacon's own utilitarian philosophy (47-48).

There are valid reasons to reject arguments that Bacon was a neo-Stoic. Not the least of these is Bacon's overt criticism of certain elements of Stoic philosophy, criticism that may be related to his perpetual efforts to curry favor with James I.¹¹⁸ Moreover, although Bacon seems always willing to mine the works of classical authors for wise sayings and pithy aphorisms, he is seldom so eager to give them credit as his intellectual antecedents, preferring instead to cast his project as a wholly new creation. Nevertheless, Stoicism is arguably the source of several important aspects of Bacon's linguistic philosophy and rhetorical practice. And, while it would be inaccurate to suggest that Bacon's philosophy precisely mirrors Stoicism, it is clear that this ancient philosophy provides a model for the sort of synthetic, comprehensive philosophical system that he hoped to create. Rather than rejecting rhetoric as the Jonesian thesis suggests, Bacon's reform of education preserves both rhetoric and "a kind of logic" within an expanded educational scheme. That reorganization is based on values that are compatible with the Stoic strain of humanism, which attempted to negotiate a path between the creation story and the Hellenistic principle of the immanent rationality of the university. Ideas from Stoic philosophy regarding the relationship between nature and the human mind are certainly a basis for Bacon's theories regarding education, rhetoric, and philosophy and

¹¹⁸ See J. H. M. Salmon, "Stoicism and Roman Example: Seneca and Tacitus in Jacobean England." Salmon examines the ways in which a group of rebellious Elizabethan and early Stuart courtiers, including Sidney and Essex, attempted to use Stoic philosophy to justify shifting authority from the monarch to the aristocracy. It is possible that Bacon's objections to certain aspects of Stoicism reflect his desire to avoid any hint of anti-monarchialism. His complaints about the Stoics focused primarily on their moral philosophy, particularly on their preoccupation with death. However, Bacon continued to admire much about the Stoics, especially Tacitus. See Edwin Benjamin's discussion of this admiration in "Bacon and Tacitus."

provide a means for uniting these arts within a comprehensive epistemological framework.

Style as Process in the Instauratio Magno

Although Bacon ostensibly intended his *Instauratio magno* as a philosophical text, it is clearly a rhetorical text. He addresses multiple audiences and his goals are complex. Among the ends Bacon articulated for the *Instauratio magno*, three are of primary importance: first, to acquaint humankind with the obstacles that stand in the way of true knowledge of the world; second, to lay out a plan for achieving a more perfect understanding; and third, to develop an “active science” in which human power is supported upon human knowledge of nature. Thus, Bacon’s project was to move from an active life in which subjective concerns obscured true vision and understanding, through a contemplative phase in which better understanding is gained, to a new and more powerful active life supported upon true and objective knowledge of the world. As his introduction to that great work, the *Novum organum* purports to be anything but a piece of mere rhetoric, but not even the most well-disposed auditor would make such an intellectual leap except under the influence of powerful persuasion. However, Bacon is true to his representation of rhetoric as the “appl[ication] of reason to the imagination for a better moving of the will.” Bacon’s persuasive action in the *Instauratio magno* and *Novum organum* is a stylistic representation of the intellectual journey he hopes that his auditors will take. It moves from a more copious style resembling humanist rhetoric to his own plain style, from methods, or continuous discourse to aphorisms, and from magistral to initiative discourse, from action and subjectivity to contemplation and objectivity.

Bacon opens the Preface to the *Instauratio magno* in a rhetorical style similar to that of his humanist counterparts. He not only uses copious language, such as doubling, and figures of sound that are more often seen in the oratorical style, he also uses extended metaphors, similes, and analogy. He compares his work to the establishment of a new edifice for learning. This new edifice will replace the crumbling, decaying temple of learning whose foundation rests not on the natural world but on the flawed wisdom of the ancients. Charles Whitney has explored at length how this metaphor “suggest[s] the restoratio nor re-edification of King Solomon’s Temple of Jerusalem [to invoke] the Christian process of spiritual edification toward salvation” (23). But the word “instauration” has a double meaning, and signifies also a new beginning. Bacon never clearly articulates which meaning he intends and, according to Whitney, he does so advisedly:

As a lover of allegory and secret codes, Bacon never explained what he meant by instauration, or why he continued to use this word so exclusively. . . . the word’s doubleness of meaning (restoration/new beginning) embraces many of the paradoxes of change with which Bacon is deeply concerned. (23)

And surely this is the case. But it is also typical of Bacon’s rhetoric to leave issues of this sort unresolved so that the audience is forced to continue to ponder the paradox and, if Bacon is successful, to seek a resolution for the mystery. Even as Bacon sets forth this paradox, he offers a means of pursuing its resolution. If the reader adopts his method, i.e., if the reader moves from the copious rhetoric of the humanists to a simple inductive practice as it is demonstrated in this text, the answer may ultimately become clear. The Preface of the *Instauratio magno* begins with as copious a metaphor as any humanist rhetorician ever articulated, an emblem of learning as “Scylla, who had the head and face of a virgin, but her womb was hung round with barking mnosters, from which she could

not be delivered” (*PW* 243). This use of simile is in striking contrast to Bacon’s discursive style at the end of the Preface when he insists that “all this depends on keeping the eye steadily fixed on the facts of nature and so receiving her images simply as they are” (253).

The movement from familiar literary style to Baconian plain style is echoed in the movement from familiar methods of continuous discourse to cryptic aphoristic discourse that characterizes the publication as a whole. The Preface takes the form of an argument with assertions, and while Bacon may give this style of argumentation his own flavor, it certainly is one that would have been familiar to his audience. As he progresses to the body of the *Novum Organum*, he abandons this discursive form and begins to set forth his argument in aphorisms. In doing so, he hopes to move his audience from their old rhetorical habits to his new method. A similar rhetorical movement is discernible between the two books of the *Novum organum*. There is a clear difference between the language and arguments of these two books. They are both presented in aphorisms, but the first book is clearly directed at those who have yet to be persuaded to embrace the inductive study of nature. In fact, Bacon is quite clear that his purpose in this first book is to prepare the minds of his audience for his new method. Book One is arguably what Bacon called magistral discourse, i.e., discourse that “transmits knowledge to the crowd of learners,” that teaches,” and that “requires that which is told should be believed.” Book Two is initiative discourse that “intimates the new work that the convicted hearer should now begin.”¹¹⁹

In attempting to establish his new philosophy, Bacon is struggling against both scholastic dialectic and humanist rhetoric. It is the hide-bound forms of the scholastics that, in his view, constrict the current state of human knowledge, that keep it, like Scylla,

¹¹⁹ In fact, even Book Two retains some elements of continuous discourse. Only some of the more obscure texts are genuinely aphoristic.

from bearing fruit. But he is equally contemptuous of the subjectivity of the humanists whose rhetoric, he believes, obscure humanity's vision of nature, the deserving object of its attention. He subverts both these discourses to his own ends. Eloquence is consumed by plain style, syllogistic reasoning by aphoristic induction, and the gaze is turned from the subject of the self and language, to the object of nature.

Bacon's Rhetoric as a Balance Between Prudence and Skepticism

Ramus's realignment of rhetoric and dialectic was probably less influential than many twentieth-century histories of rhetoric have suggested, but there is little doubt that the art of rhetoric became increasingly less influential during the period. In *Rhetoric, Prudence, and Skepticism in the Renaissance*, Victoria Kahn traces a trajectory of decline, from the fourteenth to the seventeenth century, in the confidence regarding rhetoric's potential to move others to right action. Key to understanding the trajectory of Renaissance rhetoric, Kahn argues, is the contradiction inherent in the humanist attempt to reconcile the ideological and epistemological inconsistencies among Christianity, Ciceronian prudential rhetoric, and the practice of arguing both sides of a question (*in utramque partem*) that was a legacy of medieval Academic skepticism.¹²⁰ Quattrocento humanists

are united by their faith in the compatibility of Christianity, prudential rhetoric and Academic skepticism and they believe that the Academic skeptic's way of arguing *in utramque partem* can be used to support their ethic of decorum. Contradiction for these authors is not a logical scandal, but a sign of rhetorical possibility. Skepticism is conceived of not as a threatening relativism, but as an occasion for action. (27)

¹²⁰ Arguing in *utramque partem* was not limited to the skeptics, but is as old as the art of rhetoric itself and was the principal instructional strategy of the Sophists of ancient Greece.

These humanists saw the capability of arguing on either side of a question as liberating, as evidence for the possibility of change. The impossibility of theoretical knowledge of God provides for the possibility of free will and also determines that practical certainty was the only degree of certainty available to human beings. Practical certainty resulted from social and linguistic custom and convention, *consensus omnium*, so that the arts of politics, philology, and rhetoric were seen to be “analogous and inseparable” (27).

As the Renaissance progressed, humanists such as Erasmus, Montaigne, and Hobbes, became increasingly less certain about the efficacy of rhetoric. Kahn argues that “at the same time that their texts reveal an awareness of the ideal alliance of rhetoric and prudence, their rhetorical strategies prove to be symptomatic of an increasing anxiety of skepticism about the power of rhetoric to persuade to right action” (27). These later humanists become more concerned with examining the possibility of persuasion itself, than with attempting to persuade their readers to right action:

By emphasizing the problematic nature of interpretation, they force us to reflect on the relationship between interpretive and ethical practice, the practice of reading and practical reason. Thus, while they instruct us in the complexities of the humanist rhetorical and pragmatic conception of literature, they also allow us to perceive the shifting status of prudential rhetoric in the Renaissance and its eventual decline. (28)

According to Kahn’s narrative of the trajectory of rhetoric, by the middle of the seventeenth century when Hobbes was writing, rhetoric was a virtual “outcast from the commonwealth” (28). Unlike the Quattrocento humanists, whose religious beliefs and stable society allowed them to reconcile the inconsistencies between prudence and skepticism, Hobbes lived in an age in which epistemological certainty had been undermined on all fronts: religious, political, and social. Thus he attempted “to invent a new language of certainty, a sovereign logic that will effectively exclude all further

rhetoric *in utramque partem*” (154). He sought to distinguish between “a rhetoric of probability, opinion, and experience on the one hand, and a logic of universal truths on the other; between a prudential and a scientific method; or between a rhetoric *in utramque partem* and a logic of non contradiction” (155). For Hobbes, the end of rhetoric was victory, the end of logic, truth (155). Ultimately, he sought to substitute for the practical wisdom of his humanist predecessors “scientific” fact as a basis for certain truths upon which human beings may determine their actions.

The Academic skepticism that Kahn attributes to the earlier humanists is a function of Stoic humanism. According to A.H.T. Levi, in order to reconcile the conflict between will and desire in scholasticism, Renaissance Stoics adopted this rather mild form of skepticism that gradually evolved into the more extreme form that Kahn identifies. While skepticism and Stoicism were quite separate philosophies in the ancient world, Renaissance Stoicism and skepticism were not incompatible. Levi argues that both doctrines were transmitted within defective traditions and that the terms had been altered by scholasticism. According to Levi, “Freedom from passion, the Stoic ethical ideal of ‘apatheia’ meant either making the sage exempt from false judgment of passion, making the wise man omniscient, which was absurd, or positing in the sage recourse to the suspension of judgment . . . which was skeptical” (94). Bacon employs this milder form of skepticism as a middle ground between humanism and natural philosophy. Bacon has often been criticized because his new philosophy is, in a sense, a method without content. The same kind of skepticism by which Renaissance Stoics were able to account for the sage’s incomplete knowledge allowed Bacon to defer the realization of his intellectual project. At the same time, because the promise of his project had not yet yielded the kind of certain knowledge that the study of nature would eventually provide, rhetoric remained an essential art for the philosopher who continued, at times, to operate within the realm of

contingent knowledge. Bacon's less radical skepticism allowed him to create a middle path between his new philosophy and the rhetorical orientation of his fellow humanists.

CHAPTER FOUR

The Sage In the House of Solomon

The Stoics said that wisdom is scientific knowledge of the divine and the human, and that philosophy is the practice of expertise in utility. Virtue singly and at its highest is utility, and virtues, at their most generic, are triple — the physical one, the ethical one, and the logical one.

—Aetius¹²¹

Frances of Verulam reasoned thus with himself, and judged it to be for the interest of the present and future generations that they should be made acquainted with his thoughts.

—Francis Bacon¹²²

[A]mongst the excellent acts of that king, one above all hath the preeminence. It was the erection and institution of an Order or Society which we call “Salomon’s House”; the noblest foundation (as we think) that ever was upon the earth; and the lanthorn of this kingdom. It is dedicated to the study of the Works and Creatures of God. . . . [T]his Order or Society is sometimes called Salomon’s House and sometimes the College of the Six Days Works; whereby I am satisfied that our excellent king had learned from the Hebrews that God created the world and all that therein is within six days; and therefor he instituted that House for the finding out of the true nature of all things (whereby God might have the

¹²¹ Preface 2 (*HP* A26)

¹²² *The Great Instauration*, Proemium (*PW* 241)

more glory in the workmanship of them, and men the more fruit in the use of them) did give it that second name.

—Francis Bacon¹²³

Critical to both the practical wisdom of Renaissance humanism and the materialist philosophy of Stoicism is the concept of the sage, or wise individual. For the humanists, the sage was the *vir bonus dicendi peritus*, the good man speaking well, whose eloquence is a reflection of his virtue. The Stoic sage, on the other hand, is the individual who is completely dedicated to the study of nature and who has submitted completely to the rational will of the universe. For the humanist, the *vir bonus* is an essential concept because, after all, the entire impulse of the humanist project is the inculcation of values, and the *vir bonus* constitutes an exemplar to be imitated. For the Stoics, the concept of the sage is even more important because, unlike philosophies and religions that posit an ideal to which one must aspire, the individual exists in a universe that is the working out of reason. Virtue consists, not in realizing some abstract ideal, but in perceiving and conforming to the *logos* of Nature. Thus, much of the extant literature of Stoicism, such as Seneca's epistles, or meditations like those of Marcus Aurelius, comprises lessons on proper behavior examples of strategies by which the sage gains wisdom. When these two systems, humanism and Stoicism, are combined, there are subtle changes in both the character and goal of the sage, who is now required to gain both practical and theoretical knowledge and to put that knowledge to work for the benefit of society. Francis Bacon's *New Atlantis* demonstrates the role of the sage in a humanistic society. Bacon's sage is both wise and productive, learning from nature and distributing her bounty to his fellow citizens. He unites the contemplative life of the Stoic sage with the active life of the

¹²³ *The New Atlantis* (PW 721)

humanist vir bonus engaged in service to the commonwealth. In Bacon's society, art performs a normative function to perfect reason within the individual. I argue that this is related to the conflation of *techne* and *logos* in the Stoic concept of nature.

The *New Atlantis*

Bacon's fragmentary text, *The New Atlantis*,¹²⁴ clearly offers an alternative to Thomas More's humanist vision of *Utopia*. Though composed about one hundred years apart, the similarities between the two texts are striking. Both narratives take place on remote islands previously unknown to European explorers, and the stories are related by sailors who, having become lost at sea, discover the islands when blown off course by life-threatening storms. Both societies, though unknown to Christian Europe, have through some miraculous event become aware of and been converted to Christianity, and both have benefitted from social reforms made by a wise and enlightened king. However, the differences are equally striking. In More's *Utopia*, the problems that plague European society are ameliorated by a closely ordered communal society in which power and wealth are strictly controlled and evenly distributed. In Bacon's Bensalem, however, the well-ordered society is a result of prosperity that is itself the result of natural philosophy and technology; it is a society ruled by wise men whose study of natural philosophers

¹²⁴ As with most of Bacon's texts, the *New Atlantis* has been extensively examined and written about over the years. See Judah Bierman, "The *New Atlantis* Bacon's Utopia of Science" and "Science and Society in the *New Atlantis* and other Renaissance Utopias"; Jerry Weinberger, "Science and Rule in Bacon's Utopia: An Introduction to the Reading of the *New Atlantis*." "On the Miracles in Bacon's *New Atlantis*." "Francis Bacon and the Unity of Knowledge: Reason and Revelation"; See Elizabeth McCutcheon, "Bacon and the Cherubim: An Iconographic Reading of the *New Atlantis*," for a close reading of the imagery of the cherubim in the *New Atlantis* and of several of the emblems in the original texts. See the extended discussion of the *New Atlantis* in Timothy Reiss's *Discourse of Modernism*. See also Denise Albanese, "The *New Atlantis* and the Uses of Utopia," and *New Science, New World* for a discussion of the *New Atlantis* as colonialist literature. In this same vein, see also Claire Jowett, "'Books Will Speak Plain': Colonialism, Jewishness, and Politics in Bacon's *New Atlantis*." See also Kate Aughterson, "The 'Waking Vision' Reference in *The New Atlantis*" and "'Strange Things So Probably Told': Colonialism, Jewishness, and Politics in Bacon's *New Atlantis*." For a critique of such readings, see Catherine Gimelli Martin, "The Ahistoricism of the New Historicism: Knowledge as Power versus Power as Knowledge." Also see Bronwen Price's recent anthology, *Francis Bacon's New Atlantis: New Interdisciplinary Essays*.

allows them to reap the benefits of God's creation for themselves and their fellow citizens. More's text is a somewhat pessimistic view of humankind, which suggests that the baser elements of our nature may only be suppressed through the most vigorous control. Bacon's *New Atlantis* is a much more optimistic text that hints at the relative perfectability of human nature through art and science.

The New Atlantis was most likely written sometime in 1624 and was published posthumously in 1627 by Rawley along with the *Sylva sylvarum*.¹²⁵ According to Spedding, "the story of Solomon's house is nothing more than the vision of the practical results which [Bacon] anticipated from the study of natural history diligently and systematically carried on through successive generations" (Editor's Preface to *The New Atlantis*, *PW* 710). Rawley called it a fragment, and it clearly seems to be incomplete. However, Spedding suggests that its brevity is a reflection of the unfinished state of Bacon's project:

Of the state of Solomon's House he has told us all that he was as yet qualified to tell. His own attempts to "interpret nature" suggested the apparatus which was necessary for success; he had but to furnish Solomon's House with the instruments and preparations which he had himself felt the want of. The difficulties which had baffled his single efforts to provide that apparatus for himself suggested the constitution and regulations of a society formed to overcome them; he had but to furnish Solomon's house with the helps in head and hand which he had himself wished for. His own intellectual aspirations suggested the result; he had but to set down as known all that he himself most longed to know. But there

¹²⁵ *Sylva sylvarum* is one of Bacon's fragmentary philosophical texts. It consists of a large number of aphorisms, which Rawley called a "heap of Particulars." Rawley divided them into "centuries," but there is no other apparent organizational scheme as in the *Essays*. See Hutton 49-50.

he was obliged to stop. He could not describe the *process* of a perfect philosophical investigation; because it must of course have proceeded by the method of the *Novum Organum* which was not yet expounded. Nor could he give a particular example of the result of a such investigation, in the shape of a Form or an Axiom; for that presupposed the completion not only of the *Novum Organum* but (at least in some subject) of the Natural History also. . . . Here therefore he stopped. (*PW* 710)

Spedding's confidence in Bacon's intellectual integrity is impossible to confirm.¹²⁶ Many of Bacon's philosophical texts are unfinished, while the aphoristic style of others makes them seem incomplete. It was, after all, a tenet of Bacon's philosophy that "scientific" communication should be incomplete, a goad to spur the auditor to further investigation.¹²⁷ Whether it is complete or not, however, *The New Atlantis* offers an intriguing glimpse of a society led by wise men whose knowledge is secured by natural philosophy, "not an ideal world released from the natural to which ours is subject, but of our world as it might be made if we did our duty by it" (Spedding *PW* 710).

The Wise Men of Bensalem

For the Renaissance humanist, the issue of character was of utmost importance. The ideal humanist was the *vir bonus dicendi peritus*, the "good man speaking well," whose eloquence arose from "a harmonious union between wisdom and style" and whose "aim was to guide men toward virtue and worthwhile goals, not to mislead them for vicious or trivial purposes" (Gray 498). Central to the appeal of *The New Atlantis* is the character of the Bensalemites. They possess, in Spedding's words, "sober piety," "serious

¹²⁶ Spedding follows Rawley's explanation for the fragmentary nature of this text. For an alternative explanation, see J. C. Davis, *Utopia and the Ideal Society: A Study of English Utopian Writing, 1516-1700*, 105-37.

¹²⁷ See Bacon's discussion of "broken knowledge" in Book VI, Ch. 2 of *De augmentis*.

cheerfulness,” “tender and gracious courtesy,” “open-handed hospitality,” “fidelity in public and chastity in private life,” “grave and graceful manners,” “order, decency and earnest industry” (711). In addition, the inhabitants of Bensalem were, for the most part, Christians, having encountered a mysterious chest containing the books of the Bible. They were equally well acquainted with the histories and mythologies of other lands, including those of the far east and the Americas. This knowledge was gained both from their own travels to other lands and from travelers whom they had received throughout history.

The narrator of *The New Atlantis* meets a number of individuals whose actions demonstrate the character of the larger society of Bensalem. The first meeting between the ship’s company and a citizen of Bensalem takes place after they seek refuge in their harbor following a storm. The crew saw on the shore of the city “divers of the people, with bastons in their hands, as it were forbidding us to land; yet without any cries or fierceness but only as warning us by signs that they made” (456). When the Bensalemites deliver to the ship a scroll, which offers them sanctuary for sixteen days, as well as asking after their needs for food, water, medical treatment, or repairs to their ship, it is evident that theirs is a hierarchically-ordered, Christian society, acquainted with the world outside its borders, clearly cautious, but not apparently xenophobic. The ship’s company, who are put at ease by this encounter, inform the Bensalemites of the status of their ship and health and are later invited into a place called the “Stranger’s House” where they are “accommodated of things both for our whole and for our sick” (459). The sailors’ dealings with the island’s inhabitants are characterized by the utmost civility, and when they meet the governor of the Stranger’s House, they admire his “gracious and parent-like” treatment of them (716). Their treatment in the Stranger’s House so impresses them that they said that “we were come into a land of angels, which did appear

to us daily and present us with comforts, which we thought not of, much less expected” (716).

It is not merely the generosity of spirit that impresses the narrator; he also admires their physical well-being and the abundance and quality of their material culture. It is clear from the beginning that Bensalem’s society is a wealthy one with material goods of quality at least equal to that of Europe. The narrator describes the city as “well built,” and the parchment on which the greeting is written is superior to the European equivalent—“somewhat yellower than our parchment, and shining like the leaves of writing tables, but otherwise soft and flexible” (713). The officer who meets them is wearing a gown of “an excellent azure color, far more glossy than ours” and persons whom they subsequently meet are dressed even more finely (713). The streets through which the ship’s company pass are all “fair” and the Stranger’s House is well-constructed, commodious, and includes an infirmary for their sick. The food is healthful and of the highest quality:

Soon after our dinner was served in, which was right good viands; both for bread and meat; better than any collegiate diet than I have known in Europe. We also had drink of three sorts, all wholesome and good; wine of the grape; a drink of grain, such as is with us our ale, but more clear; and a kind of cider made of a fruit of that country; a wonderful pleasing and refreshing drink. Besides, there were brought into us a great store of those scarlet oranges for our sick; which (they said) were an assured remedy for sickness at sea. (461)

The narrator is also impressed by the knowledge of the healing arts the Bensalemites demonstrate. During their first encounter, the official who greets them explains that their hesitancy in granting them entrance to the city is on the advice of their Conservator of Health in case the illness of their sailors was contagious. The notary who boards the ship carries with him a fruit “like an orange . . . which cast a most excellent odor” which he

seemed to use “for a preservative against infection” (459). Once they arrive at the house, their sick are supplied with a box of pills to hasten their recovery (461).

Bensalem is clearly a wealthy society. The Governor of the Stranger’s House tells them that there are sufficient funds to care for the entire ship’s company for at least sixteen days and to compensate them in silver or gold for any of their own stores that are used. However, it soon becomes clear that the real currency of this society is knowledge. Every twelve years a group of Bensalemites would travel to other lands, to discover “knowledge of the affairs and state of those countries to which they were designed, and especially of the sciences, arts, manufactures, and inventions of all patterns in every kind. . . . But thus you see we maintain a trade, not for gold, silver, or jewels; nor for silks, nor for spices; nor any other commodity of matter; but only for God’s first creature, which was *Light*; to have *light* (I say) of the growth of all parts of the world” (722). The propagation of that knowledge was the task of the fellows of Salomon’s House.

The House of Salomon

According to the history of Bensalem, which is related by the governor of the House of Strangers, the wisest of the Bensalemites was a King Solamona, who had reigned about nineteen-hundred years previously, and whom the Bensalemites considered “a divine instrument, though a mortal man” (*PW* 720). Solamona “had a ‘large heart’, inscrutable for good, and was wholly bent to make his kingdom and people happy” (721). This king was the primary author of the laws of the land and, having realized the self-sufficiency of his kingdom, had instituted hospitality laws to protect Bensalem against opportunistic visitors. However, he “preserved all points of humanity” regarding the good treatment of strangers, allowing those who desired to do so to remain and learn from them.

The source of Salomona's wisdom was the lost works of King Solomon, "that Natural History which he wrote, of all plants, from the 'cedar of Libanus' to the 'moss that groweth out of the wall', and of all 'things that have life and motion'" (721). Salomona, feeling an affinity with Solomon, instituted an "Order or Society," which he called "Salomon's House" that is "dedicated to the study of the Works and Creatures of God" (721). Salomon's House is also called The College of the Six Days Work, which the governor intuitively is because "our excellent king had learned from the Hebrews that God had created the world and all that therein is in six days; and therefore he instituting that House for the finding out of the true nature of all things (whereby God might have the more glory in the workmanship of them, and men the more fruit in the use of them) did give it that second name" (721). It is clear that the Fathers of the order are held in the greatest esteem by the Bensalemites, as evidenced by the quality of his conveyance and garments better than those even of the governor of the city, and the respect accorded him. During his procession into the city, the narrator says that "the street was wonderfully kept; so that there was never any army had their men stand in better battle-array, than the people stood. The windows likewise were not crowded, but every one stood in them as if they had been placed" (726). The fellows of the House of Salomon are the equivalent of the Renaissance ideal of the *vir bonus dicendi peritus*, but it is not merely speaking well that sets them apart.

The New Atlantis as a Synthesis of Humanism and Stoicism

In the *New Atlantis*, Bacon depicts a society in which many of the conflicts that led to the anxieties of Renaissance Europe have been reconciled. In earlier works, he made linkages among a number of concepts that are at the heart of the conflicts among church, humanism, and natural philosophy, conflicts that seem to present no problem for the inhabitants of Bensalem. These concepts—God, nature, reason, knowledge, and

power—do not trouble the inhabitants of the New Atlantis as they did Renaissance Europeans. The inhabitants of Bensalem have internalized a set of beliefs that authorize the study of natural philosophy as the basis for a well-ordered society. However, the fellows of the House of Salomon are inculcated with more than a set of values that enable their study of nature and manipulation of the knowledge gained for the betterment of their society.’ they have also internalized arts and methods.

The centerpiece of Bacon’s new philosophy was a methodology by which human beings could reap the benefits of Nature. Bacon’s new method functions as an art, or *techne*, in the same way as rhetoric and dialectic. *Technai*, however, are culturally problematic because they do not encompass particular cultural, moral, or ethical value systems. Plato’s complaints against rhetoric in the Socratic dialogues are emblematic of the objections to a *techne*. In *Rhetoric Reclaimed*, Janet Atwill connects the conflicts in the humanist/liberal arts epistemological tradition to the older *techne* tradition. *Technai*, or arts, occupied the realm of productive knowledge as distinct from theoretical or practical knowledge. For example, Plato’s epistemological scheme distinguished only between true and sham arts, and classified philosophical method, or dialectic as a true art with rhetoric as a sham art. Aristotle replaced this two-fold classification with one that included three categories of knowledge: theoretical, practical, and productive. Theoretical knowledge included mathematics and moral and natural philosophy; practical knowledge included ethics and politics; productive knowledge included medicine, the art of warfare, and rhetoric. According to Aristotle’s epistemological typology, the productive arts, or *technai*, were not bound by values or knowledge in the same way that the theoretical and productive arts were.

Atwill identifies three characteristics of a *techne*:¹²⁸

- (1) A *techne* is never a static, normative body of knowledge. A *techne* is described as a *dynamis* (or power) and a set of transferrable strategies. A *techne* neither represents reality nor encompasses a set of deductive postulates.
- (2) A *techne* resists identification with a normative subject. . . . As such, there are no well-defined boundaries between the subject and knowledge. Consequently, it is difficult, if not impossible, to make *techne* conform to either Plato's equation of knowledge and virtue or Quintilian's *vir bonus*
- (3) *Techne* marks a domain of human intervention and invention. What is at stake in a *techne* is neither subjectivity nor virtue. . . . [T]echné is defined against the forces of necessity, spontaneity, experience, chance, compulsion, and force; it is often associated with the transgression of an existing boundary In contrast to philosophical knowledge, a *techne* is defined by its relation to situation and time. A *techne* is knowledge as production, not product, intervention and articulation, rather than representation. (7)

In subsequent centuries, most productive arts came to be identified as "crafts," while rhetoric as productive knowledge came to be identified with the handbook tradition, (Atwill 5-6).

In the Stoic period, the concept of *techne* was transformed as a result of its role in the Stoic conceptualization of nature. The Stoics defined nature as a combination of reason and matter. Zeno called nature "a craftsmanlike fire, proceeding methodically to

¹²⁸ Atwill's examination of the concept of *techne* is limited to the period between the seventh through fourth centuries BCE. Understanding of the concept varied over this time period, but Atwill contends that these characteristics remained relatively constant.

the work of generation” and Diogenes Laertius said that the Stoic view of nature was as an “artistically working fire going on its way to create.” Diogenes Laertius also calls nature “a force moving of itself, producing and preserving in being its offspring in accordance with seminal principles.”¹²⁹ In these definitions, the Stoics use the terms *techne* and *logos* in referring to the active principle in the universe, a principle that is equivalent to God. According to Gerard Watson, “The picture that emerges from this combination of *techne* and *logos* is of a natural power working in a unified fashion through the control of details . . . to produce in time one perfect co-ordinated structure” (1). Because humans, as rational beings, share in the *logos* of the universe, the concept of *techne* is key to Stoic epistemology and is the basis of their “realization of the importance of the particular, even in the midst of a system where universal unity seems at first to be the overriding consideration” (1).¹³⁰

Techne, for the Stoics, was no longer an inferior form of making knowledge. According to Watson, a *techne* is an activity, unified by a plan or structure, the knowledge of which is gradually acquired through experience. In time this knowledge becomes a part of the artist himself, and constitutes the constant norm which imposes itself on the contingent which is its field. In imposing itself it relies on the immediate apprehension of the individual concrete reality. The production of the particular depends on the artist’s skill and at each point he must choose what will best suit the realization of his concept. This implies an aesthetic

¹²⁹ The citation from Zeno comes from Cicero’s *De natura deorum* II 57. The quotations from Diogenes Laertius are from VII 156 and VII 148, respectively. All three are cited in Gerard Watson, *The Stoic Theory of Knowledge*, 1.

¹³⁰ Stillman has described the political implications of *technai* for Bacon: “Politics is a conservative business, inherently resistant to change, Bacon understands, since ‘a change even for the better is distrusted, because it unsettles what is established’ (4.89) By contrast, the arts are dynamic and progressive; they depend upon change and the ‘noise of new works and further advances’ (4.89-90). Natural philosophy is liable to be perceived as politically suspect by reason of the very dynamism intrinsic to its operation” (*New Philosophy and Universal Language* 81).

judgment based on intuition, involving selection and limitation. It involves a keen awareness of the particular and its conditions, and since it is production, it cannot ignore details. (3)

It is easy to see how the Stoic conflation of *techne* and *logos* transforms the concept of *techne*. First, while *techne* may not have been a static, normative body of knowledge, it acted, to the extent that it was internalized by the sage, as a “constant norm.” The second characteristic of *techne* in the previous centuries no longer applies; *techne* is now clearly identified with a normative subject. In the Stoic model, as in previous philosophical systems, *technai* operate in the field of the contingent, but what is contingent in Stoicism is not nature, but the individual’s knowledge of nature. Thus, according to Watson, the usefulness of *techne* is that it allows for assembling particulars and testing them against one another, which allows the individual to act “artistically” and function as a rational being (7).

Watson’s description of the work of the Stoic sage might well be a description of Bacon’s project. The inductive method is founded upon an extensive and careful assembly of as many particulars as possible. From these particulars, by means of exclusion and inclusion, according to the “Prerogative Instances” that he delineates in the *Novum organum*, the “sons of science” eventually will be able to draw general principles in order to assemble a true picture of the world:

It must be remembered that in this *Organum* of mine I am handling logic, not philosophy. But since my logic aims to teach and instruct the understanding, not that it may with slender tendrils of the mind snatch at and lay hold of abstract notions (as the common logic does), but that it may in very truth dissect nature, and discover the virtues and actions of bodies, with their laws as determined in matter, so that this sciences flows not merely from the nature of the mind, but also from the nature of things;

no wonder that it is everywhere sprinkled and illustrated with speculations and experiments in nature, as examples of the art I teach. (*NO* I.iii)

Bacon clearly draws a distinction here between art and philosophy, as do the Stoics. Similarly, the virtue of the art is clearly secured by the virtue of nature, and it is the conjunction of the nature of the mind with the nature of things that secures the legitimacy of the art. Bacon echoes the Stoic concept of art as “knowledge [that] becomes a part of the artist himself and constitutes the constant norm which imposes itself on the contingent which is its field” when he argues that the purpose of arts is to achieve the “furthest end of knowledge . . . to give a true account of their gift of reason ” (*Advancement*, *PW* 60).

For the Stoics, whose philosophical aim was to live in accordance with nature, *techne* was directed toward the perfection of the individual’s rationality. However, for Bacon the civic humanist, that the pursuit of knowledge is not merely an intellectual pursuit, but required an active component as well:

But this is that which will indeed dignify and exalt knowledge, if contemplation and action may be more nearly and straitly conjoined and united together than they have been; a conjunction like unto that of the two highest planets, Saturn the planet of rest and contemplation, and Jupiter the planet of civil society and action. Howbeit, I do not mean when I speak of use and action, that end before-mentioned of the applying of knowledge to lucre and profession. . . . Neither is my meaning, as was spoken of Socrates, to call philosophy down from heaven to converse upon the earth; that is, to leave natural philosophy aside and to apply knowledge only to manners and policy. But as both heaven and earth do conspire and contribute to the use and benefit of man, so the end ought to be, from both philosophies, to separate and reject vain speculations and

whatsoever is empty and void, and to preserve and augment whatsoever is solid and fruitful; that knowledge may not be as a courtesan, for pleasure and vanity only, or as a bond-woman, to acquire and gain to her master's use; but as a spouse for generation, fruit, and comfort. (60)

Productive knowledge was an inseparable part of Bacon's project. Following Democritus, who said that "the truth of nature lieth hid in certain deep mines and in caves," Bacon divides natural philosophy into "the mine and the furnace, and [makes] some to be pioneers and some smiths; some to dig, and some to refine and hammer" (*Advancement*, *PW* 92). He identified two branches of natural philosophy: the Inquisition of Causes (also called Speculative and Natural Science) and the Production of Effects (also called Operative or Natural Philosophy) (92). These two branches were inextricably linked via a "double scale or ladder, ascendent and descendent; ascending from experiments to the invention of causes, and descending from causes to the invention of new experiments" (92-93). Bacon divided the Inquisition of Causes into Physic and Metaphysic, both of which were based upon a comprehensive natural history. Bacon represents this theoretical branch of natural philosophy as a wholly integrated discipline: "For knowledges are as pyramids of which history is the basis: so of Natural Philosophy the basis is Natural History: the stage next the basis is Physics: and the stage next the vertical point is Metaphysics" (*Advancement*, *PW* 92). As for the vertical point of the pyramid, which he calls the Summary Law of Nature or *Philosophia Prima*, Bacon is unsure whether that degree of knowledge is attainable by human beings. Physic "should handle that which supposeth in nature only a being and a moving" while Metaphysic "should handle that which supposeth in nature further a reason, understanding, and platform" (94). In Aristotelian terms, Physic is concerned with material and efficient causes, while Metaphysic is concerned with formal and final causes (94). Natural history

was concerned with gathering particulars, Physic with comparing those instances using inductive logic, and Metaphysic with deriving universal principles from them.

For Bacon, *techne* was also intimately related to technology. Bacon was fascinated with improvements in all kinds of mechanical arts. His interest in the ideas of the French ceramicist and potter Bernard Palissy has already been noted. In the Preface to the Great Instauration, he contrasts the creativity and progressiveness of the mechanical arts with the stultification of the intellectual arts:

Observe also, that if sciences of this kind had any life in them, that could never have come to pass which has been the case now for many ages — that they stand almost at a stay without receiving any augmentation worthy of the human race . . . In the mechanical arts we do not find it so; they, on the contrary, as having in them some breath of life, are continually growing and becoming more perfect. As originally invented, they are commonly rude, clumsy, and shapeless; afterwards they acquire new powers and more commodious arrangements and constructions; in so far that man shall sooner leave the study and pursuit of them and turn to something else, than they arrive at the ultimate perfection of which they are capable. (*PW* 244)

In Book One of *Novum Organum*, Bacon addresses the connection between intellectual arts and mechanical arts and the subservience of both to Nature, saying that “Human knowledge and human power meet in one; for where the cause is not known, the effect cannot be produced. Nature to be commanded must be obeyed” (*NO* I.iii, *PW* 259). For Bacon, knowledge without corresponding technological production was problematic not only because it produced no fruit, but also because he saw technology as furthering the advancement of knowledge itself. He compared the status of knowledge in his day to the fable of the monstrous Scylla,

who had the head and face of a virgin, but her womb was hung round with barking monsters, from which she could not be delivered. For in like manner the sciences to which we are accustomed have certain propositions which are specious and flattering; but as soon as they we come to the particulars, which are the parts of generation, when they should produce fruit and works, then arise contentions and barking disputations, which are the end of the matter and all the issue they can yield. (*Inst. magno*, Author's Preface, *PW* 243)

This stultification of the intellectual arts is contrasted with technological innovation, which serves as the metaphor for progress. In contrast, the invention of the compass is instrumental in furthering discovery, "but as in former ages, when men sailed only by observation of the stars, they could indeed coast along the shores of the old continent or cross a few small and mediterranean seas; but before the ocean could be traversed and the new world discovered, the use of the mariner's needle, as a more faithful and certain guide, had to be found out" (246).

The concept of art or *techne* was also a critical aspect of Bacon's attempt to resolve conflicts between natural philosophy and religion. As has been discussed earlier, Bacon's view of nature is that it is the expression of God's power, as compared to divine revelation, which is the expression of God's will. He also suggests that to engage in the work of natural philosophy is a holy act:

But these three [natural history, physic, and metaphysic] be the three stages of knowledge; and are to them that are depraved no better than the giants' hills [Pelion, Ossa, and Olympus piled on one another], . . . but to those who refer all things to the glory of God, they are as the three acclamations, Sancte, sancte, sancte; holy in the description or dilatation of

his works, holy in the connection or concatenation of them, and holy in the union of them in a perpetual and uniform law. (*Advancement*, PW 95)

For Bacon, the practice of natural philosophy and, indeed, of all the intellectual arts, is intended to realize the individual's own potential, to derive benefits to enhance the status of humankind, and to glorify God.

The Sage

For the Stoics, the ultimate product of *techne* is the Sage, or wise man, who according to R. J. Hankinson, never errs in making choices: "Secure in their understanding of the providential structure of the world, which is identical with fate, which in turn is identical with the will of Zeus, Sages order their lives in accordance with it, assimilating their will to the will of Zeus, living in accordance with nature, and so achieving the smooth flow of life, the *eurhoia bioa* so devoutly to be wished" (59). The Stoic relationship between *techne* and character can be summarized in this way. *Techne* is the means of securing knowledge about nature to which the Sage conforms.

The Stoic Sage per se was not an ideal model for Bacon's new philosopher. Not only was Bacon careful not to ally himself too closely with the more fractious English neo-Stoics, but he rejected the more fatalistic elements of Stoic philosophy. While he approved, for example, the Stoic control of the passions, he rejected the extremes to which they might go to achieve that control. In a letter to the Earl of Rutland, he said, "The Stoics were of the opinion that there was no way to attain this even temper of the mind but to be senseless, and so they sold their goods to ransom themselves from their evils" (qtd. in Salmon 212). The Stoic's emphasis on preparation for death and their pessimism directly contradict Bacon's program for advancement of the human condition. Regardless of his objection to these aspects of Stoic ethical philosophy, the concept of the wise individual is integral to Bacon's project.

The concept of the good or wise man was familiar to Renaissance humanists as it had come down through the liberal arts tradition. It is clear, too, that the notion of the wise individual is important to Bacon. In Book One of *The Advancement of Learning*, he offers many historical examples of wise men who have contributed to the received store of knowledge of his age. For example, Adam, before the fall, represents the perfect knowledge of nature to which Bacon aspires. Abel, the contemplative shepherd is superior to Cain, the tiller of the soil. Moses, the lawgiver, had all the learning of the Egyptians. (*PW* 61-2). All the examples of wise men that Bacon assembles have in common a tendency toward contemplation and study. While he recognizes that God was in the beginning obliged to “employ persons altogether unlearned otherwise than by inspiration” in subsequent ages “he did send his divine truth into the world waited on with other learnings as with servants or handmaids” (63). Thus, just as humanist education was intended to create a particular kind of subject, Bacon’s project for the reform of learning relied on the intellectual arts to produce a certain kind of educated individual. In his essay “Of Studies,” he explores the ways that particular disciplines impart particular characteristics:

Histories make men wise; poets witty; the mathematics subtle; natural philosophy deep; moral grave; logic and rhetoric able to contend. *Abeunt studia in mores*. [The studies pass into the manners.] Nay there is no stond or impediment in the wit but may be wrought out by fit studies; like as the disease of the body have appropriate exercises. . . . So if a man’s wit be wandering, let him study the mathematics; for in demonstrations, if his wit be called away never so little, he must begin again. If his wit be not apt to distinguish or find differences, let him study the schoolmen; for they are *cymini sectores* [splitters of hairs]. If he be not apt to beat over matters,

and to call up one thing to prove another, let him study the lawyers' cases.

So every defect of the mind may have a special receipt. (*PW* 798).

For Bacon, however, education not only should improve the mind, but should lead to action as well. The "true" end of knowledge is "for the benefit and use of life," and it must be "perfected and governed in charity" to avoid the consequences experienced by angels who "lust[ed] for power" and men who "lust[ed] for knowledge"(Preface to the Great Instauration, *PW* 247). Bacon saw his new instauration "not as an opinion to be held, but as a work to be done" and as the "foundation, not of any sect of doctrine, but of human utility and power" (247).

From Techne to Technology

The Fellows of the House of Salomon in the *New Atlantis*, are examples of the kind of sage who embodies not only the appropriate values, but the necessary arts as well, so that they are capable of producing theoretical, practical, and productive knowledge. Their work is both philosophical and mechanical, theoretical and experimental. They produce both knowledge and goods for their society. In a meeting with the narrator, the Father of the House of Salomon offers to impart "the greatest jewel I have . . . the true state of Salomon's house," including "the end of our foundation. Secondly the preparations and instruments we have for our work. Thirdly the several employments and functions whereto our fellows are assigned. And fourthly, the ordinances and rites which we observe" (727). According to the Father, "The End of our Foundation is the knowledge of Causes, and secret motions of things; and the enlarging of the bounds of Human Empire, to the effecting of all things possible" (727).¹³¹ The Father of the House of Salomon describes the many and varied activities of the institution, as well as their

¹³¹ See Richard Serjeantson, "Natural Knowledge in the *New Atlantis*," for a discussion of the quality of Bacon's natural knowledge.

various facilities, which include mines, both artificial and natural; towers; lakes, pools, streams, and cataracts, as well as artificial wells and fountains; great and spacious houses for the study of meteorological phenomena; Chambers of Health; orchards and gardens, parks and enclosures; brew houses, bake-houses, and kitchens; dispensaries, or shops of medicines; furnaces; perspective-houses, sound-houses; engine-houses; a mathematical house; and houses of deceit of the senses. Within these various laboratories, the Fathers and Sons of the House of Solomon are engaged in all manner of arts and sciences, including mining, ceramics, climatology, engineering, botany and the propagation of species of flora and fauna, medicine, the culinary arts, and optics (727-731). It is clear that the activities of the House of Salomon represent technai or arts. For example, the Father of the House describes the propagation of fruits:

And we make (by art) in the same orchards and gardens, trees and flower to come earlier or later than their seasons; and to come up and bear more speedily than by their natural course they do. We make them also by art greater much than their nature; and their fruit greater and sweeter and of differing taste, smell, colour and figure, from their nature. And many of them we so order, as they become of medicinal use. (728)

And again, regarding experimentation in animal husbandry, he says, "Neither do we do this by chance, but we know beforehand what manner and commixture what kind of those creatures will arise" (728). The Father also demonstrates the relationship between art and technology:

We have also divers mechanical arts, which you have not; and stuffs made by them; as papers, linen, silks, tissues; dainty works of feathers of wonderful lustre; excellent dyes, and many others; and shops likewise, as well for such as are not brought into vulgar use amongst us as for those that are. For you must know that of the things before recited, many of them

are grown into use throughout the kingdom; but yet if they did flow from our invention, we have them also for patterns and principals. (729)

The interrelationship between art and character in Bacon's philosophy is emblemized in the description of the occupations of the fellows of the House of Salomon. They have a variety of tasks, but what is important to recognize is that their titles are related to the arts they perform and the benefits they produce. Twelve of them, called "Merchants of Light," travel to foreign lands and bring back "books, and abstracts, and patterns of experiments" (731). "Depradators" collect experiments from books; "Mystery-men" collect experiments of mechanical arts and liberal sciences; "Pioners or Miners" try new experiments of their own design; "Compilers" assemble and transmit the data from the work of the others; "Benefactors or Dowry-men" examine the experiments of the others to draw out "things of use and practice for man's life and knowledge as well for works as for plain demonstrations of causes, means of natural divinations, and the easy and clear discovery of the virtues and parts of bodies" (732); "Lamps" direct new experiments "of a higher light, more penetrating into nature than the former" after meetings and consultations of the whole membership; "Inoculators" execute the experiments directed by the Lamps; and the Interpreters of Nature: "raise the former discoveries by experiments into greater observations, axioms, and aphorisms" (731-32).

The ordinances and rites include the veneration both of products of their art and of their greatest minds. In long galleries, they display "patterns and samples of all manner of the more rare and excellent inventions" (732). They also erect statuary to their own greatest minds and to those from other lands, such as the inventor of ships, the inventors of music, letters, and printing; and Christopher Columbus for discovering the West Indies. (732). They have "certain hymns and services which we say daily, of laud and thanks to God for his marvellous works; and forms of prayers, imploring his aid and blessing for the illumination of our labours, and the turning of them into good and holy

uses” (732). And finally, they travel to foreign lands to make known both the fundamental natural philosophy and “new profitable inventions” (732).

The degree to which the values and methods of the House of Salomon are inculcated into its Fellows is illustrated by a story regarding the Bensalemites’ conversion to Christianity. The inhabitants of Bensalem, although their civilization had no contact with European civilization, were Christians as the result of a separate divine revelation involving the discovery of an ark containing both canonical and non-canonical books of the Bible. The Governor of the Stranger’s House explains how, about twenty years after the ascension of Christ, the arrival of this ark was marked by a “a great pillar of light” rising from the sea, topped by “a large cross of light more bright and resplendent than the body of the pillar” (464). Among those who went out to examine this phenomenon was “one of the wise men of the society of Salomon’s House” who “attentively and devoutly viewed and contemplated” the pillar and cross, and then made the following prayer:

Lord God of heaven and earth, thou has vouchsafed of thy graces to those of our order, to know the works of creation, and the secrets of them; and to discern (as far as appertaineth to the generations of men) between divine miracles, works of nature, works of art, and impostures and illusions of all sorts. I do here acknowledge and testify before this people, that the thing which we now see before our eyes is thy Finger and a true Miracle; and forasmuch as we learn in our books that thou never workest miracles but to a divine and excellent end (for the laws of nature are thine own laws, and thou exceedest them not but upon great cause), we most humbly beseech thee to prosper this great sign, and to give us the interpretation and use of it in mercy; which thou dost in some part secretly promise by sending it to us. (464)

This prayer, which echoes Bacon's *Confession of Faith*, asserts that nature is God's creation and that he does not interfere with its laws. The response of this "wise man of the House of Salomon," after "attentive" and "devout" viewing and "contemplation" of the phenomenon, is to offer an eloquent prayer for wisdom to interpret and use this revelation. In relating this story, the governor calls the House of Salomon the "eye" of the society, but it is, in fact, much more. The fellows do not merely observe, although observation is their initial response to phenomena, either natural or unnatural. Their observation is followed by interpretation and then by use. Observation and interpretation are governed by reason and method; use is governed by art. The Fellow of the House of Salomon, because his character has been honed by the observation of nature and the application of method, is able to discern the truth of the divine revelation. *Techne* is an essential concept in Stoicism as it is for humanism, and it is through *techne* that Bacon is able to resolve the conflict between humanism, natural philosophy, and Christian theology.

The Rhetorical Value of the House of Salomon

Given their belief in the possibility of language to achieve practical certainty and to move individuals to right action, the production and consumption of literary texts were acts of great importance for early Renaissance humanists. Quattrocento humanist rhetoric was situated within the context of civic humanism and allied to the virtue of prudence, or practical wisdom. Because the marker of the individual's achievement of humanist values was eloquence, the art of rhetoric was critical to the humanist project. As it was practiced during the quattrocento, however, rhetoric was a "truncated version of classical rhetoric" because it did not extend to legislative and legal settings (Kahn 38). Rather, it was primarily epideictic rhetoric — the rhetoric of praise or blame. Unlike other scholars who stress the limitations on rhetoric and view quattrocento rhetoric as a precursor to a purely

aesthetic form of the art, Kahn suggests that the conflation of rhetoric and poetics “enlarges the sphere of literature, since the written text now takes on the functions of deliberative and judicial rhetoric” (38). Thus, the production of the work of literature, or any work of art, was a deliberative or prudential act, as was consumption of that work through the act of reading:

[P]rudence or practical reason that is deliberation about action in a social or political context is also at work in the artist’s production of a work of art. Prudence is, in this sense, the precondition of artistic decorum, just as it is of ethical decorum. As a result, the work of art is seen less as an object than as reflecting a certain process or activity or judgment. (39)

Consequently, “knowledge of the literary text can only be practical, since the interpretive practice of reading requires the same acts of discrimination, the same judgments of decorum, as does the author’s practice of writing” (39). For the humanists, then, literary texts — and these included primarily poetry and drama, dialogues, and texts such as Philip Sydney’s “Defense of Poesy” — were considered appropriate rhetorical activities that could lead individuals to right action in the realm of human affairs.¹³² Bacon’s *New Atlantis* follows in this tradition and is intended to lead both the king and fellow citizens to the right action of embracing natural philosophy.

Civic humanism during the Renaissance was nowhere more fully developed than in England of the fifteenth and sixteenth centuries, and texts such as Thomas Elyot’s *Boke Named the Gouvernour* and Thomas More’s *Utopia*, were critical elements in the transmission of humanist values. Although they are generically very different—*The Boke Named the Gouvernour* is an advice book to rulers while *Utopia* is a detailed description of the life and habits of the citizens of a fictional island—both texts are concerned with

¹³² This understanding of reading as a deliberative and/or prudential act helps to elucidate the power of the “book of nature” metaphor that was prominent in the discourse of early modern natural philosophers.

the proper way to organize and govern society. Such texts, as Kahn has suggested, perform an essentially rhetorical function, in that the act of reading was seen as a deliberative and prudential act.¹³³ More's *Utopia*, for example, acted as a critique of various social ills, and offered as a solution a highly-structured communal society whose laws and customs were founded upon Christian and humanist values. Like his fellow humanists, Bacon was interested in improving society, and his *New Atlantis*, which is clearly a response to More's *Utopia*, offers the very different view of how to accomplish that goal. Both More's *Utopia* and Bensalem of Bacon's *New Atlantis* are island societies, discovered by sailors lost at sea. More imagines a communal society in which power is diffused because its leaders are drawn from the general population and serve for limited terms. In Bacon's ideal society, the leaders are philosophers who are dedicated to the "proficiency and advancement" of knowledge as a means of improving their society.¹³⁴ The social institutions in *Utopia* are based on humanist ethical principles; in *The New Atlantis*, ethical principles are derived from natural philosophy, and the preeminent social institution is a philosophical society. In Bensalem, nature is not only the source of material benefits, but serves a normative function as the source of knowledge from which serves as a basis for an ethical system. Bacon's blending of Stoic concepts with humanistic values.

The century between the publication of these two texts comprised a critical time in the declining trajectory of rhetoric as an architectonic epistemological art. As Kahn

¹³³ While More's *Utopia* was not the first text to present the image of an ideal society, it has come to represent all such literature. See Paul Salzman, "Narrative Contexts for *New Atlantis*" for a discussion of the series of narratives touched off by Bacon's response to More. See also Elizabeth Dickinson Blodgett, "'The New Atlantis' and Campanella's 'Civitas Solis'" and Timothy J. Reiss, "Structure and Mind in Two Seventeenth-Century Utopias: Campanella and Bacon" for examinations of Bacon's work to another contemporary piece of Utopian literature. See also Denise Albanese, "The *New Atlantis* and the Uses of Utopia."

¹³⁴ The leaders of Bacon's Bensalem are more reminiscent of the philosopher-kings of Plato's *Republic*. An essential difference between More's *Utopia* and *The New Atlantis* is that More assumes that society's resources are limited and guards against discord by leveling class and monetary distinctions; Bacon suggests that the new philosophy will reduce discord because it creates an abundance of material goods.

and Stillman have suggested, by the early part of the seventeenth century there is considerably less confidence in the power of language to produce the right action that is required to make a good society than More would have felt. Because the integrity of humanist rhetoric was secured by the concept of the *vir bonus*, one might assume that with the decline of rhetoric the importance of the *vir bonus* within society might also have declined. However, the part played by such individuals within these two narratives suggests that such is not the case. If anything, the wise individual is even more important in Bacon's *New Atlantis* than in More's *Utopia*. Moreover, Bacon's act of producing the text of the *New Atlantis* suggests that he did not consider the persuasive power of texts to have been completely lost.¹³⁵ What is clear, however, in Bacon's new society is that eloquence persists, but rhetoric has lost its epistemological primacy to a variety of other arts.

Solomon as Rhetorical Trope

Of all the wise men in history, Bacon most admired Solomon of whom he said:

[I]n the person of Salomon the king, we see the gift or endowment of wisdom and learning, both in Salomon's petition and in God's assent thereto, preferred before any other terrene or temporal felicity. By virtue of which grant or donative of God, Salomon became enabled not only to write those excellent parables or aphorisms concerning divine and moral philosophy, but also to compile a natural history of all verdure, from the cedar upon the mountain to the moss upon the wall, (which is but a rudiment between putrefaction and an herb), and also of all things that

¹³⁵ See Sarah Hutton, "Persuasion to Science: Baconian Rhetoric and the *New Atlantis*." Hutton argues that Bacon follows Sydney in believing that poetic, or imaginative texts, have greater persuasive power than histories. She also discusses Bacon's ideas regarding the impact of figurative language and metaphor.

breathe and move. Nay, the same Salomon the king, although he excelled in the glory of treasure and magnificent buildings, of shipping and navigation, of service and attendance, of fame and renown and the like, yet he maketh no claim to any of these glories, but only to the glory of the inquisition of truth. (*Advancement*, *PW* 246-7).

It is not difficult to identify what Bacon admired about Solomon. The use of aphoristic reasoning, the emphasis on natural history, and the comprehensive nature of Solomon's interests—divine, moral, and natural philosophy—are all things that Bacon himself attempted. However, Bacon also exploited the Solomonic ideal of the wise king in his attempt to persuade James I to help establish the kind of institution he proposed in the various texts of the *Instauratio Magna*.

In the opening pages of *The Advancement of Learning*, Bacon praises James's eloquence and wisdom.¹³⁶ He compares James to Solomon, praising him for his God-given ability "to compass and comprehend the greatest matters, and nevertheless to touch and apprehend the least" (*PW* 42). Bacon's purpose for the *Advancement of Learning* was to provide for James a description of the excellency of learning and knowledge, a description of the current status of knowledge, and his prescription for its advancement. He hoped that his work would "excite [James's] . . . to visit the excellent treasures of [his] mind, and thence to extract particulars for this purpose agreeable to [his] magnanimity and wisdom" (*PW* 43). Bacon repeats this comparison in the Epistle Dedicatory to the Great Instauration. "you who resemble Solomon in so many things—in the gravity of your judgment, in the peacefulness of your reign, in the largeness of your heart, to the noble variety of books you have composed" (*PW* 242).

¹³⁶ See Sharon Achinstein, "How to Be a Progressive Without Looking Like One: History and Knowledge in Bacon's *New Atlantis*." Achinstein argues that Bacon's project is, in fact, intended to enhance the power of the monarch. See also David Colclough's "Ethics and Politics in the *New Atlantis*," and Simon Wortham, "Censorship and the Institution of Knowledge in Bacon's *New Atlantis*."

This flattery of James is not mere sycophancy, however, but is intended to urge James to support Bacon's educational reforms and Great Instauration in substantial material ways. In the Epistle Dedicatory, Bacon asks that James follow Solomon's example in

taking order for the collecting and perfecting of a Natural and Experimental History true and severe (unencumbered with literature and book-learning), such as philosophy may be built upon — such, in fact, as I shall in its proper place describe; that so at length, after the lapse of so many ages, philosophy and the sciences may no longer float in air, but rest on the solid foundation of experience of every kind, and the same well examined and weighed. I have provided the machine, but the rest must be gathered from nature. (*PW* 242).

Bacon was not asking merely for James's encouragement; in fact, he hoped that James would provide resources to endow institutions in which the research for this natural and experimental history would occur. In the *Advancement of Learning*, Bacon identifies three "objects" involved in learning: places, books, and persons (*PW* 75). Regarding books, he was concerned with the institution of libraries for assembling the works of ancient authors and with commissioning the production of new and more accurate translations of these authors (75).

There are four items to be considered regarding the places of learning: "foundations and buildings, endowments with revenues, endowments with franchises and privileges, institutions and ordinances for government; all tending to quietness and privateness of life, and discharge of cares and troubles" (*PW* 76). Bacon was concerned that the colleges and universities of Europe were primarily places for professional education and argued that institutions dedicated to the arts and sciences were needed. He argued for institutions that were devoted to philosophical pursuits as a way of building up

knowledge to form a better foundation for philosophical education. He also sought to reform faculty compensation, arguing that the most competent teachers must be adequately compensated. Bacon also sought to encourage “men to sell their books and build furnaces” (*PW* 77). He wanted to build on the growing trend of experimental philosophy and sought means of providing the instruments for that work. Finally, he was concerned with the governance of educational institutions, particularly regarding curriculum and communication between and among institutions (*PW* 77-79). Bacon demonstrates the kind of institution he hopes James will establish in *The New Atlantis*.

In establishing Solomon as the model for King Salomona and Solomon’s learning as model for the intellectual activity undertaken there, Bacon manages to reconcile Christian tradition with the new practice of natural philosophy. Moreover, although the kind of natural philosophy he describes bears significant similarities with Stoic philosophy, he places it neatly within a Christian context. In addition, in describing a natural philosophy that is both theoretical and practical, he reconciles the conflict between the *vita contemplativa* and *vita activa*. The Fathers of the House of Salomon represent the kind of practice and institutions that will bring Bacon’s Great Instauration to fruition.

The apothegm that appears at the beginning of Bacon’s Great Instauration is an almost perfect emblem of the role the wise individual ought to play in society. The wise individual reasons, i.e., applies method to observation in order to form generalized judgments. However, judgment, or making knowledge, is not sufficient in Bacon’s conceptualization. The wise individual is also required to communicate that knowledge for the “interest of present and future generations.” This combination of reason, judgment, and utility is the essence of Bacon’s attempt to reconcile the contemplative life of medieval scholasticism with the active life of Renaissance humanism. However, the basic conflict between the active and contemplative life was rooted in epistemological

inconsistencies, the conflict between scholastic dialectic and humanist rhetoric, between received theology and the contradictory discoveries of natural philosophers. Stoic philosophy provided a means to mediate these conflict.

By the the time Francis Bacon was writing during the late Renaissance, a variety of epistemological activities were jostling against one another. Christian theology was secured by the revealed word of God, while scholasticism privileged the art of dialectic, which relied on the philosophical universals of syllogistic reasoning. Humanists, on the other hand, valued ancient texts and privileged the art of rhetoric for its utility in the contingent realm of human government. Renaissance humanism was concerned with the production of a normative subject, the *vir bonus peritus dicendi* (the good man speaking well). However, the values to which the Renaissance humanist conformed were not logically derived from nature, but from various texts and cultural institutions. In large part, recovered ancient texts led to the focus natural philosophy, which in turn challenged long-held ideas about the place of human beings in the natural world. Resulting technological advances not only changed the physical culture, but enlarged the known world. Stoic philosophy provided a way to reconcile many of these conflicts. Stoic naturalism provided a way to reconcile the conflicts between traditional Christianity and natural philosophy. The concept of the Sage, the wise individual, was also useful. While Renaissance humanism was concerned with the production of a normative subject, the *vir bonus dicendi peritus* (the good man speaking well), the values to which the Renaissance humanist conformed were not logically derived from nature. Stoic philosophically provided a foundation for objectively applying inductive logic to the study of God's natural creation in order to garner benefits for humankind. However, Bacon lived in a humanist age, in which virtue was allied with character. Thus, throughout the Great Instauration, Bacon illustrates the humanist values with human exemplars. and situates his new philosophy within humanist educational and religious institutions. In sum,

Bacon's new philosophy embeds significant aspects of Stoicism — its belief in Nature as normative and certain epistemological beliefs — within a Christian and humanist matrix.

CONCLUSION

For man is but the servant and interpreter of nature; what he does and what he knows is only what he has observed of nature's order in fact or in thought; beyond this he knows nothing and can do nothing. For the chain of causes cannot by any force be loosed or broken, nor can nature be commanded except by being obeyed. And so these twin objects, human Knowledge and human Power, do really meet in one.

—Francis Bacon¹³⁷

Bacon at last, a mighty Man arose,
Whom a wise King and Nature chose,
Lord Chancellor of both their Laws,
And boldly undertook the injured pupil's caus. . . .
Like some old Giants more Gigantic Ghost,
To terrify the Learned Rout,
With the plain Magique of true Reasons Light,
He chac'd out of our flight,
Nor suffer'd Living Men to be misled,
By the vain shadows of the Dead;
To graves from which it rose the conquer'd Phantome fled;
He broke that Monstrous God which stood. . . .

¹³⁷*Inst. magno*, Plan of the Work, *PW* 253.

The Orchard's open now, and free,
 Bacon has broke that Scare-crow Dietie;
 Come, enter all that will,
 Behold the ripen'd fruit come gather now your Fill;
 Yet still, methinks, we fain would be
 Catching at the Forbidden Tree,
 We would be like the Deitie
 When Truth and Falshood, Good and Evil, we
 Without the Sences aid within ourselves would see;
 For 'tis God only who can find,
 All Nature in his Mind. . . .
 From Words, which are but the Pictures of the Thought,
 (Though we our Thoughts from them perversely drew)
 To Things, the Minds right Object, he it brought,
 Like foolish Birds, to painted Grapes we flew;
 He sought and gather'd for our use the True;
 And when on heaps the chosen Bunches lay,
 He prest them wisely the Mechanic way,
 Till all their juyce did in one Vessel joyn,
 Ferment into a nourishment Divine,
 The thirsty Souls refreshing Wine. . . .
 Bacon, like Moses, let us forth at last,
 The barren Wilderness he past,
 Did on the very Border stand,

Of the blest promis'd Land,
And from the Mountain Top of his Exalted Wit,
Saw it himself, and shew'd us it.

—Abraham Cowley¹³⁸

The Renaissance was an age during which almost all foundations of cultural certainty were undercut. The Protestant Reformation questioned the authority of Catholic Church. New forms of government, new types of economic activity, and a resultant social mobility upended the stable, hierarchical social order. Discoveries of new lands, new technological inventions, and new ways of seeing the natural world led to new ways of understanding the relationship between human beings and the world. The humanist's recovery of a variety of ancient texts injected a host of new ideas that challenged both the stultified logic of the scholastics and the contingent art of humanist rhetoric. The abandonment of Latin, the *lingua franca*, for the common vernacular languages constituted an almost Babel-like confounding of the epistemological status quo. It was a time of intense cultural anxiety, but also a time of tremendous opportunity for new intellectual projects. It is, perhaps, no surprise that modern science would have its beginning during this period. Given the tremendous variety of ideas jostling against one another, it is appropriate to examine the ways in which the "new" natural philosophy achieved the kind of epistemological supremacy it now holds. Francis Bacon has long been recognized as one of the fathers of the scientific revolution, although it is clear that

¹³⁸ *Ode to the Royal Society*, ll. 37-40, 43-50, 58-78, 93-98 Publ. in Spratt *History of the Royal Society*.

his contribution is not consistent with that of many others such as Galileo's experiments view of the heliocentric universe or Robert Boyle's experiments with air pressure. Historians of science such as Alexandre Koyré have suggested that the idea that Bacon was a scientist is a joke. Others have suggested that his contribution was merely as the father of a plain style of discourse more suitable to scientific communication than the ornate style of Renaissance rhetoric.

To assign Francis Bacon to the scrap heap of the scientific revolution or to limit his contribution to the invention of the plain style is to ignore the real impact of his philosophical works during the years subsequent to his death. While Bacon's rather peculiar philosophical method was never successfully implemented, even, so far as we know, by Bacon himself, his emphasis on the compilation of an exhaustive natural history as a foundation for practical, experimental science was taken seriously by a number of his near-contemporaries. Nevertheless, Bacon's contribution to the development of modern science was important. His role was that of an apologist for natural philosophy who used his considerable rhetorical skills to make a case for the acceptance of ideas and practices that were radically at odds with those of his contemporaries. Bacon's contributions to the changes that have been called the scientific revolution are both epistemological and institutional. First, he made the case for a view of nature as a rational and orderly creation the workings of which could be understood and manipulated by human beings. Second, he argued that natural philosophy was the appropriate foundation for all intellectual endeavors. Finally, he made the case for the establishment of institutions to support the work of natural philosophers. As an apologist for the new philosophy, Bacon drew from ancient philosophies, particularly Stoicism, using both the rhetorical skills and the cultural values of his humanist context.

The Stoic Humanism of Bacon's New Philosophy

The philosophy of the Stoics, a synthesis of a variety of ancient philosophies, was a comprehensive system based upon the notion that the whole of the universe is the embodiment of reason. As such, it is ultimately perceptible by human beings who share in its rationality. For the Stoics, the ultimate good was to study nature and to conform to its rationality. They believed that physics, the study of nature, was the most important branch of philosophy and should form the basis for their logic and moral philosophies. It was a philosophy that valued the inward life of contemplation and meditation. Renaissance humanism privileged rhetoric as an architectonic art in a world of shifting values and valued the active life of service to one's community. Bacon's new "active science" combined both Stoicism's emphasis on natural philosophy with the humanist desire to better the human condition.

The passage from the Plan of the Work from Bacon's *Instauratio magno* is emblematic of his blending of Stoicism and humanism. His representation of humankind as the "servant and interpreter of nature" is derived from the Stoic notion of submission to the rationality of nature, but is also compatible with the Christian notion of submission to the will of God. Human knowledge is limited to what can be observed in nature using the rational faculty that defines human nature. The "chain of causes" to which Bacon refers is more consonant with the Stoic notion of cause and effect than with the Aristotelian concept of the four causes. Bacon is not willing, however, to accept the fatalism that is part of Stoic philosophy. His humanistic sense of service to society is too strong. He intends not merely to study nature, but to reap its benefits for his fellow beings, recognizing, however, that nature cannot "be commanded except by being obeyed." Thus, in Bacon's philosophy, "human Knowledge and human Power, do really

meet in one.” The humanistic impulse toward bettering society transforms Stoic knowledge of nature into power over the natural world.

Natural History

The most successful element of Bacon’s program for human learning is the notion that a thorough gathering of particulars was necessary before deriving general principles. Bacon draws from Stoic epistemology. In the division of the disciplines in Bacon’s *Advancement of Learning*, Bacon organizes the “parts of human learning” according to the psychological faculties of memory, reason, and imagination. He allots history to the memory, philosophy to reason, and poesy to the imagination (*PW* 79). Each major division of studies, i.e., natural, civil, ecclesiastical, or literary, is subdivided into according to these parts. In all cases, history is the foundation upon which the other parts are founded. The notion that a comprehensive natural history is a necessary beginning for natural philosophy is Bacon’s most tangible contribution to the practice of early modern natural philosophy. Among the early examples of texts which followed Bacon’s description of a natural history was Joshua Childrey’s *Britannica Baconia: Or, the Naturall Rarities of England, Scotland, and Wales* in 1661. In 1662, John Graunt and William Petty published *Natural and Political Observations . . . Made Upon the Bills of Mortality*, and in 1665 *London’s Dreadful Visitation*, a collection of the Bills of Mortality for the year 1664. Among the most articulate and effective adherents to Bacon’s belief in the need for a comprehensive natural history were John Wilkins, founder of the Royal Society, and Robert Hooke.

In addition to being the leading light in the founding of the Royal Society, John Wilkins is best known for his attempts to establish a universal language, which he

describes in his *Essay towards a Real Character, and a Philosophical Language*, published in 1668. Wilkins follows Bacon's pattern of gathering the largest possible particular instances from which to infer generalities. Wilkins makes a distinction between being and knowing as they are related to the development of a metaphysics: "The *particulars* are first in the order of *Being*, yet *Generals* are first in the order of *Knowing*. Now the proper end and design of *Metaphysic* should be to enumerate and explain those more general terms, which by reason of their Universality and Comprehensiveness, are above all those heads of things styled Predicaments, or else *common* to *several* of them" (24). Wilkins' attempt to develop a universal language are not merely an attempt to develop a simplified language, but are part of the kind of a comprehensive program that had implications not merely for institutionalized science, but for society as a whole.

Robert Hooke was first employed by the fellows of the Royal Society in 1662 as Curator of Experiments, but was not elected a fellow until 1665. In 1677, he became one of the Secretaries of the Society. He was a professor of Geometry at Gresham College, Oxford, and is perhaps best known as author of *Micrographia*, in which he documented the results of his examination of bodies, great and small, terrestrial and astronomical, using a magnifying lens. He was also author of a text on natural philosophy: *A General Scheme, or Idea of the Present State of Natural Philosophy*. The extended subtitle of this text indicates that the remediation of its defects should include experimentation as well as "collecting observations" in order to compile "a natural history as the solid basis for the superstructure of true philosophy" (*Posthumous Works*). Hooke's *Natural Philosophy* closely follows Bacon's plan in its early stages. While Bacon calls his method as the *Novum Organum*, Hooke sets out to develop a "True Method of Building a Solid Philosophy or of a Philosophical Algebra" (7). He divides the project into three parts:

1st, An Examination of the Constitution and Powers of the Soul, or an Attempt of Disclosing the Soul to it self, being an Endeavour of Discovering the Perfections and Imperfections of Humane Nature, and finding out ways and means for the attaining of the one, and the helping of the other;

2ndly, A Method of making use of, or employing these Means and Assistances of Humane Nature for collecting the Phenomena of Nature, and for compiling of a Philosophical History, consisting of an exact description of all forms of Natural and Artificial Operations, or a Method of making Experiments and Observations for the Prosecution and Examination of any Philosophical Inquiry.

3rdly, A Method of describing, registering, and ranging these Particulars so collected, as that they may become the most adapted Materials for the raising of Axioms and the Perfecting of Natural Philosophy. (7-8)

Hooke's natural philosophy both adheres to and extends Bacon's work in significant ways. His defects of the soul are effectively a recounting of Bacon's Idols of the Mind, but he is much more specific regarding the "perfections." His experimental methods go far beyond Bacon's tables for induction. Clearly, however, he is a true disciple of Francis Bacon and adopts his belief in a normative natural philosophy.

The Father of the Royal Society

What is perhaps Bacon's most important contribution to the development of modern science is the notion that the state should establish and support an institution to

support the advancement of natural philosophy. The House of Salomon in the *New Atlantis* is an example of a collegial philosophical institution that he describes in the *Advancement of Learning*, which served as a model for the institution of the British Royal Society. Bacon died in 1626 and the Royal Society was not established until 1662, so that he was not directly involved in the establishment of the institution. However, the notion that an experimental society ought to be an officially recognized and supported part of national culture is clearly consistent with Bacon's plan. The establishment of the Royal Society and its early history led to a number of conflicts, but the question of whether a society to explore natural philosophy ought even to exist was no longer an issue.¹³⁹

At the beginning of the second book of *The Advancement of Learning*, Bacon suggests that James I should be concerned, not only with leaving behind heirs to the throne, but to "be conversant not only in the transitory parts of good government, but in those acts which also are in their nature permanent and perpetual" (PW 75). The most appropriate of these acts, in Bacon's view, is to "[endow] the world with sound and fruitful knowledge" (76). The works related to learning had three foci: "the places of learning, the books of learning, and the persons of the learned" (75). Like water, which is wasted unless it is "collected into some receptacle where it may by union and comfort and sustain itself" (75) the

excellent liquor of knowledge, whether it descend from divine inspiration
or spring from human sense, would soon perish and vanish to oblivion if it

¹³⁹ See Michael Hunter, *Establishing the New Science: The Experience of the Early Royal Society* for an extensive examination of the founding of the Royal Society and its relationship to the wider polity of seventeenth-century England. See also Shaeffer and Shapin, *Leviathan and the Air Pump* for an extensive examination of one of the controversies that formed the context of these cultural negotiations.

were not preserved in books, traditions, conferences, and places appointed, as universities, colleges, and schools, for the receipt and comforting of the same. (75-76).

The House of Salomon in the *New Atlantis* represents the kind of intellectual institution Bacon describes in *Advancement of Learning*. Its fellows, who are among the society's most revered and wealthy members, engaged in both theoretical and applied studies, and gathered knowledge, theories, and inventions from all parts of the intellectual globe. It is also, according to Joseph Glanvill, the model for the British Royal Society: "Salomon's House in the NEW ATLANTIS was a Prophetick Scheam of the ROYAL SOCIETY" (65).

The notion of an intellectual fraternity engaged in the study of natural philosophy was, like many of his ideas, not original to Bacon.¹⁴⁰ The earliest of these societies was the Italian Academie Lincei (the Academy of the Lynx), founded in 1603 by the nobleman Francesco Cesi, whose most famous member was Galileo Galilei. The Accademie Français, founded by Cardinal Richelieu, also predated the Royal Society, but pursued a theoretical rather than experimental approach. According to its first historian Thomas Sprat, the small group of individuals who formed the core of the Royal Society first began meeting "some space after the end of the Civil Wars" (53) in John Wilkins lodgings at Wadham College, Oxford, where they continued intermittently until about 1658. The group reconstituted itself in 1660 and was incorporated by Charles II as the Royal Society in 1662.

¹⁴⁰ See Martha Ornstein, *The Role of Scientific Societies in the Seventeenth Century*, for a history of these academies and societies.

The significance of Francis Bacon to the Royal Society is apparent in the frontispiece of Thomas Sprat's *History of the Royal Society*, in which Bacon is pictured along with Charles II and Lord Brouncker, who was president of the Royal Society. Bacon's influence is also celebrated in Abraham's Cowley's ode "To the Royal Society," which is reproduced at the beginning of Thomas Sprat's history. Cowley not only adopts Bacon's metaphor of knowledge as a sweet liquid which must be gathered and preserved, but also argues that previous generations had limited philosophy to the study of discourse when its true province should be the study of nature. Bacon, "like Moses" had led humankind from the captivity of ancient philosophy, but never entered the promised land. Exploration of that land was left to the Fellows of the Royal Society. Bacon's influence is also apparent in Sprat's history of philosophy in the goals of the Royal Society as they are articulated by Sprat in his history.

Their purpose is, in short, to make faithful Records of all the Works of Nature, or Art, which can come within their reach; that so the present Age, and posterity, may be able to put a mark on the Errors which have been strengthened by long prescriptions, to restore the Truths, that have lain neglected; to push on those, which are already known, to more various uses: and to make the way more passable, to what remains unreveal'd. This is the compass of their Design. And to accomplish this, they have indeavor'd, to separate the knowledge of Nature, from the colours of Rhetorick, the devices of Fancy, or the delightful deceit of Fables. (61-63)

They recommended similar reforms to the curriculum and advocated the remedy the error that "Seats of Knowledge have been for the most part heretofore, not Laboratories as they ought to be, but onely Scholes, where some have taught, and all the rest subscrib'd" (68).

They also invited scholars from various professions and from different parts of Europe. Finally, what distinguished the Royal Society most particularly was its emphasis on experimental philosophy and the method by which they carried it out. According to Sprat, two things governed their experiments. First, they prescribed no particular “art of Experimenting” but kept themselves free to adapt their methods to “different circumstances, that occur to them in their operations; and the several alterations of the Bodies on which they work” (89). Further, they determined to “regard the least, and the plainest of things, and those that may appear at first the most inconsiderable” (90), reasoning that their predecessors had erred in collecting only extraordinary examples of the qualities of matter. Like Bacon, they believed a true and accurate natural history was an essential foundation upon which to build further knowledge.

* * *

In *Leviathan and the Air Pump*, Shaffer and Shapin examine a controversy between the political philosopher Thomas Hobbes and Robert Boyle, one of the early members of the Royal Society and author of a series of experiments utilizing his invention, the air pump, to investigate a variety of questions about that most ubiquitous material, the answers to which we now take for granted. A consequence of the controversy that that is of greatest interest to Shaffer and Shapin is that Hobbes, who was a member of the Royal Society and was known in his day as an accomplished natural philosopher, is now remembered almost exclusively for his political writings. Hobbes had been, in fact, “virtually written out of the history of science” by the end of the eighteenth century (8). Shaffer and Shapin conclude that Hobbes’s disappearance from the history of

science is not necessarily a result of his ideas being inherently wrong, but reflects a fundamental difference in what counts as scientific knowledge: “which propositions were to be counted as meaningful and which absurd, which problems were soluble and which not, how various grades of certainty were to be distributed among intellectual items, where the boundaries of authentic knowledge were to be drawn” (332). They argue that the Hobbes-Boyle controversy represents a conflict; it is not merely a scientific debate, but a serious disagreement about how and where science ought to be performed. It illustrates their contention that “there is a conditional relationship between between the nature of the polity occupied by scientific intellectuals and the nature of the wider polity” (332). The disappearance of Hobbes from the history of science suggests that the experimental form of philosophy championed by Bacon had clearly triumphed.

At the beginning of the seventeenth century, there is no question that the polity occupied by scientific intellectuals was a precarious space, indeed. Early modern natural philosophers, in many cases, practiced at their own risk within a larger polity which was, itself, plagued by uncertainties. The so-called scientific revolution was only possible because a place was opened within that wider polity for it to occur. By skillfully blending the Stoic attitude of normative nature with the Christian concept of nature as a second divine text within the context of civic humanism, Francis Bacon helped to authorize the pursuit of experimental natural philosophy. Though his scientific method *per se* was never practiced, his contributions as an apologist for the development of early modern science are beyond question. ”

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