THE RELEVANCE OF BENJAMIN FRANKLIN'S AND THOMAS JEFFERSON'S TECHNICAL WRITING FOR MODERN COMMUNICATORS

by

KRISTIN MEECE FECKO
B.S. Syracuse University, 2003
M.S. Pennsylvania State University, 2005

A thesis submitted in partial fulfillment of the requirements
for the degree of Master of Arts
in the Department of English
in the College of Arts & Humanities
at the University of Central Florida
Orlando, Florida

Summer Term
2014

ABSTRACT

Today's technical communicators enjoy an increasingly broader role and influence in the workplace, and are often given latitude to use engaging rhetoric and personal touches in many kinds of communications. Historical documents, particularly those that are substantially removed from our own era, can offer fresh approaches and insight into the enduring elements of successful communication. This study explores the technical writings of Benjamin Franklin and Thomas Jefferson and considers their usefulness to professionals today.

Although the political writing of Franklin and Jefferson is more familiar, both men frequently wrote about scientific and technical subjects and were well-known in their day for these documents. Franklin created a captivating persona and arguments which carried emotional and logical appeal. Jefferson was a student of ancient rhetoric and applied classical principles of arrangement to guide readers. His fondness for statistical records led to a skill in presenting numerical data and other types of information in creative, efficient ways. By using tone, language, and description, both Franklin and Jefferson created technical narratives that are equally informative and aesthetically pleasing.

The contemporary era of technical communication has been shaped by positivism, the plain language movement, and humanism, among other significant trends. Franklin's and Jefferson's approaches to technical communication both support and challenge the guiding philosophies of these movements. Their styles are reviewed in this study against the context of modern approaches. Opportunities for further historical study are also offered, including additional writings of our Founding Fathers and technical writing from the turn of the twentieth century.

ACKNOWLEDGMENTS

I wish to express my gratitude to the University for offering this program online, and to the faculty and staff of the Departments of English and Writing and Rhetoric for being so helpful and accommodating. I would like to thank my committee members, Drs. Madelyn Flammia and Thomas Cavanagh, for their support and advice, not only as thesis reviewers but also as instructors. Most importantly, thank you to my advisor, Dr. Daniel Jones, for helping me to define the shape of this study and continuously offering encouragement, even when a draft warranted criticism instead. Thank you for your dedication and guidance throughout this process.

They say that no man is an island; surely no woman is either. I have been blessed with supportive family, friends, and coworkers who urged me on as I worked towards this degree. My husband, Benjamin Fecko, deserves a great deal of credit for helping me stay the course. Thank you for believing in me, challenging me, and being the greatest support not only in spirit, but in the practical day-to-day. I couldn't have done this without you. Thank you also to my son, Charles Benjamin Fecko, who fills every minute of every day with joy. I love you both with all my heart.

Thank you to my family by marriage, Joseph and Nancy Fecko, and Daniel and Ashlee Fecko, for their love and support. Most especially, thank you to my parents, Carl and Susan Meece, for their tremendous love, enthusiastic encouragement, and constant prayers. I love you more than words can say.

Lastly, thank you to my sister, Lauren Meece, who also returned to school to earn her graduate degree. I learned more during this journey because I shared it with you. Thank you for making me laugh, and for always seeing the best in me. I adore you.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER ONE: INTRODUCTION

Introduction: Applying Historical Works to Modern Practice

Among today's fast-moving, predominantly electronic communications, we may think of the past as dusty or quaint, but certainly detached from contemporary practice. The role of technical communicators today is expanding into new areas where professionals may, for example, serve in a project manager role, bringing together different viewpoints into a cohesive, engaging rhetoric (Kim and Tolley 378; Cook 5-6). Revisiting technical communications in history can help practitioners navigate these expanded opportunities, as successful works of the past "establish some boundaries for technical communication in practical discourse, [and]…ask questions about contexts and influences on the evolution and contributions of the field" (Rude 190). One such example is Isaac Newton's *Opticks,* a highly influential and unconventional discussion of color, light, and related phenomena published at the turn of the eighteenth century. *Opticks* was one of the first technical works that presented experimental results in a persuasive manner, and it was intentionally written to be approachable and engaging to an audience that knew nothing about science (Cohen 42-3). Newton gave considerable thought to the selection and arrangement of the material he presented, chose to write in common English instead of elitist Latin, and avoided the use of mathematical equations entirely (D. Locke 8; Cohen 42-3). *Opticks* is considered one of the most important contributions to modern science for its technical content, while at the same time, it is a masterful use of the rhetorical skills and audience awareness that professional communicators are urged to use today (D. Locke 121).

Statement of Problem and Purpose of Study

In the course of the past two centuries, as scientific and technical research and innovations have grown more sophisticated, communication regarding these matters has followed suit, becoming increasingly structured and distant-sounding. Technical prose has been burdened with substantives, jargon, and excessive adjectives, and authors have tried to remove themselves from view using the third person and passive verbs (D. Locke 90; Malone 336). Corporate conventions, professional journal formats, and industry traditions have constrained communicators further, valuing "calculated ambiguity" over audience appeal (Schiess, "What Plain English" 57; E. Smith 212, 215; Rutter 31; Tebeaux, "What Makes Bad" 12). Slowly, though, it has become apparent that the human touch is more important in creating engaging, and ultimately effective, communication — even at the expense of invulnerability and efficiency (Whitburn et al. 352; Whiteman 116). Although the "problem of narrowness and excessive commitment to pragmatism" has been widely recognized, some debate still remains as to the nature of the most useful skills for technical communicators today (Rutter 31). Broader concepts of technical communication attempt to reconcile the previous extremes that focused on rhetorical theory or technological skills, but there is still much opportunity to define a new, hybridized approach (Lanier 51).

Technical writing from the Age of Enlightenment, which roughly spanned the seventeenth and eighteenth centuries, is particularly appropriate for study today. The era contains many of the same hallmarks of our age: a belief in standardized methods of empirical study, a desire to share technical information and discoveries with a variety of audiences, and an interest in communicating ideas, arguments, and instructions in the most efficient and effective way possible. This study looks at the technical writings of two important figures from the

Enlightenment, Benjamin Franklin and Thomas Jefferson. I consider the strengths of their communication styles and their likeness to, and departure from, common approaches today, for the use of modern practitioners. Specifically, I focus on these research questions:

1. What fresh perspectives do writers from the Age of Enlightenment offer to technical communicators today?
2. In what ways do Franklin and Jefferson demonstrate an understanding of rhetorical principles and a commitment to practicality in their technical writing?
3. What elements of Franklin's and Jefferson's writing differ from the traditional style of scientific writing we are familiar with today?

Although Franklin and Jefferson are best known for their political roles in the founding of our country, many are also familiar with Franklin's electrical discoveries and Jefferson's agricultural interests. In fact, both men became widely known in their day on the strength of their technical writing skills. In 1751, Franklin gained widespread fame throughout the American colonies and Europe when *Experiments and Observations on Electricity, Made at Philadelphia in America*, a compilation of personal papers and letters describing his electrical experiments, was published (Chaplin 132). Franklin's *Experiments* successfully proposed the concept of polarity in electric charges, describing electrical current in terms we still use today (Campbell 15, 57). Likewise, in 1785, Jefferson became well-known, both here and abroad, after publishing his book *Notes on the State of Virginia,* a highly detailed survey and passionate defense of the features and resources of Virginia (E. Martin 162; Thomson 13). Jefferson's *Notes* detailed some of America's great resources, using a voluminous collection of statistics and observations to proudly refute European claims of American inferiority (Thomson 3, 12; Martin 191). Both Franklin and Jefferson wrote persuasive works that caught the interest of scholars and the general

public, despite the large amounts of technical information provided in each. In the chapters that follow, I review excerpts from these and other works to determine the ways in which Franklin and Jefferson created technical prose that still proves to be engaging and persuasive.

Relevance

The study of historical writing, in itself, recognizes that more is required to create successful technical communications than simply learning standard skill sets or maintaining a familiarity with cutting-edge technologies. Scholars have noted that, by learning from successful communications in the past, historical study can offer a better understanding of the nature and impact of technical discourse, which, in turn, can lead to improvements in practice (Pringle and Williams 362; Rivers 46). In many instances, recent developments bear a resemblance to historical developments, and the successful communications from earlier eras may inspire insights into our own.

Developments in the Field of Technical Communication

Technical communication is reasoned to be nearly as old as mankind itself, based on the basic human impulse to communicate information to one another (Connors 4; Brockmann, "Bibliography" 155). Written technical discourse is thought to have emerged sometime between the tenth and the seventeenth centuries, as oral communication became less supportable among larger populations (Tebeaux, "Pillaging" 193). However, this type of communication was not recognized as a distinct genre or shaped by concerted design efforts until the years immediately following World War II, when it became an organized profession (Connors 12).

By nature, technical communication is closely aligned with science, engineering, and other technical subjects, and often reflects the characteristics of these fields. Dwight Atkinson observed that scientific study and writing is characterized by "a standard three-part formula: human → acting on → nature," and the evolutions of science and scientific writing over time are a reflection of "[w]hich particular elements of this formula may be chosen for emphasis" (360). The influences of the plain language movement, positivism, and humanism in technical communication also reflect Atkinson's observation, and place varying levels of importance on the author ("human"), his or her writing style ("acting on"), and the subject matter presented ("nature"). The plain language movement emphasizes the style used to communicate technical information, and is concerned with finding ways to make communication as clear as possible to the intended audience (Rosner 38; Schiess, "Ethical" 545). Positivism puts the emphasis on the subject matter, or "nature" component of the relationship. In the positivist view, science is self-evident fact that needs only to be presented clearly for its value to be obvious to the audience (Gross 182; Jones, *Technical* 65; C. Miller 612). Humanism, as may be expected, emphasizes the influence of the author and takes pains to recognize how his or her subjective nature shapes the technical content presented (Dombrowski, "Language" 5; C. Miller 615). Elements of each of these trends continue to be influential in technical communication and are also addressed by the writing styles of Franklin and Jefferson.

The Relevance of the Age of Enlightenment Today

The Age of Enlightenment was a time of "Romantic science" (Holmes xv). The common view today of "pure," systematic science was present in this era, but an emotional undercurrent, fueled by the excitement of new ideas and discoveries, bubbled underneath. The Enlightenment

was marked by a rejection of antiquated medieval beliefs and superstition, which felt "authoritarian and disengaged with the world" (Chaplin 18). Science as we think of it today was coming into being, and advancements in printing made the early beginnings of scientific research more accessible to the general public. The public was enamored with this access to information and even read statistics and technical works with interest (Headrick 60; Holmes xix, 131; Chaplin 6). The public interest in technical writing meant that communicators were prone to write engagingly and persuasively with a broad, human audience in mind.

Scientific and technical studies were also a social endeavor, and many advancements were made as early natural philosophers exchanged observations and theories in their personal correspondence, which was sometimes collated and published (Atkinson 341; Lyons 89). From a practical standpoint, it was important to express ideas as clearly as possible, because there was little opportunity to clarify meaning "in the absence of efficient communication networks, [when] foggy, and non-uniform reporting could lead to delays or…misunderstandings that might take months or even years to recognize and…to correct" (Rutter 27). The principles of rhetoric and composition were central to education at this time, and the highly specialized fields of technical study we are familiar with today did not exist (Connors 5; Headrick 18). As a result, the Age of Enlightenment can also be thought of as the age of the amateur (Lyons 28, 33). Without the strict separation between subjects of study that we are accustomed to today, the interests of and influences on science enthusiasts were much broader: "science and technology, and the rhetoric adopted by science and technology, were likewise associated with philosophy and with politics and ethics" (Zappen 31-2; Gaudio 10-11). This more collective approach and its influence on technical communication are interesting to consider in our era, both for their departure from our current educational system and for their similarity to the emerging influence

of crowdsourcing in scientific research. Access to information via the internet and the infiltration of social media into academia and the workplace are enabling a wider sector of the population to have access to and influence on cutting-edge developments and theory in a way that has not been seen since the early days of empirical study (Torr-Brown 569; Atkinson 365-6).

Methodology

To address the research questions that guide this study, I review several papers by Franklin and Jefferson, as well as related scholarly assessments of their work. In particular, I look at Franklin's "Description of a New Stove for Burning of Pitcoal, and Consuming all its Smoke," "Tendency of Rivers to the Sea," letters on "Sound" and "Maritime Observations," and Jefferson's *Notes on the State of Virginia*, "Instructions to Meriwether Lewis," *1783 Catalog of Books*, and letters on taxonomy and ballooning experiments, among other works. Based on a review of this material, I identify areas in which Franklin and Jefferson particularly excelled or used approaches to technical communication that are less common today. My discussion of their writing is organized according to these features of their style and technique.

These textual analyses are accompanied by a review of the scholarly literature on selected trends in the development of the technical communication profession. Specifically, I review the principles and influence of the plain language movement, positivism, and humanism, as well as the changes to the communicator's workplace moving into the twenty-first century that are impacting the role of rhetoric in modern practice. Elements of Franklin's and Jefferson's writings both support and challenge principles of these movements and the nature of communications today. The scope of this literature review is based on the premise that, in order to determine how

Franklin and Jefferson can enrich current practice, it is important to understand the nature of current practice and its large-scale influences.

The overall goal of this project is to compare and contrast our conceptions of technical communications with Franklin's and Jefferson's approaches. Edward Malone commented that historical studies "enable[e] one to see objectively and clearly…providing a frame of reference for better understanding…[and] may suggest approaches, solutions, techniques, and even genres that technical communicators can adapt and use in current projects" (343). Elements in Franklin's and Jefferson's writings that stand the test of time and continue to appeal to us as modern readers may offer new solutions for today's practice, and broaden our idea of the forms that successful technical discourse can take.

Delimitations

The nature of this study necessitates some limits be applied to the scope. I offer a review of Franklin's and Jefferson's technical writing skills based on a selection of their works, as opposed to an exhaustive account. Further, due to the subject matter, I will use the terms "scientific" and "technical" interchangeably for the purposes of this study. This decision is not intended to deny the important distinctions between these terms, but to reflect their "intertwined" nature and equal applicability to writings of the Enlightenment era (Sullivan and Porter 402-4, 407; Harris 292, 294). Historian Richard Holmes tells us that the term "scientist" "was not coined until 1833," after both Franklin and Jefferson had died (xx). In their era, the subjects we collectively refer to today as the sciences were known as "natural philosophy," "experimental philosophy," and later, "chemical philosophy." The term "science" was broader, referring to "a set of general rules…exhibit[ing] a concern with 'theoretic truth'" (Cohen 307). Joyce Chaplin

suggests that, at the time, science was simply considered synonymous with wisdom (6). Further, practical applications that we would consider today to be “technical” subjects, such as engineering, were known in the Age of Enlightenment as “practical arts” or “useful Arts” (Cohen 308).

As for Franklin and Jefferson specifically, their interests spanned the boundaries of natural philosophy and the practical arts, and their writing likewise speaks to elements of both subject areas (Lyons 145; Thomson 2-4; Goodman 2). Franklin was a true scientist and near-engineer who conducted scientific experiments trusting that they would offer practical benefit in time. In addition to his experiments with electricity and the invention of the lightning rod, Franklin experimented with heating systems, musical instruments, and even created the first bifocal glasses (Campbell 48, 68, 73). Jefferson was more interested in theory and philosophy than Franklin, but equally enthusiastic in seeking practical improvements and solutions for daily life. Jefferson conducted detailed studies in agriculture, educational curricula, animal anatomy, and climate, and produced practical inventions in several areas of interest (Thomson 2; E. Martin ix, 3). In short, it is difficult to categorize Franklin’s and Jefferson’s work and their writings as strictly scientific or technical.

Finally, the terms “writing” and “communication” are used interchangeably for the purposes of this study. Although methods of communication go beyond written text, the surviving works of

Franklin and Jefferson are all written artifacts, and both terms can be used to accurately describe those reviewed herein.

Organization of Thesis

A literature review immediately follows this introductory chapter, and I discuss Franklin's and Jefferson's writings in detail in Chapters Three and Four, respectively. Additional discussion and recommendations for further study are provided in Chapter Five. The organization of this study is outlined in greater detail below.

Chapter Two: Literature Review

A thorough review of the scholarly literature in technical communication pertinent to this project is presented in Chapter Two. The focus of this chapter is on peer-reviewed papers which examine the rhetorical foundations of technical communication and the need for historical studies within the profession. I review the efforts to refine this discourse to improve its efficacy and impact; specifically, I explore the natures and influences of the plain language, positivism, and humanism movements. Over the past 30 years, elements of each movement have merged to shape a more moderate view of technical communication, and I seek to identify the leading characteristics of this modern view, in order to better compare with writings from the Enlightenment era. This chapter will demonstrate the rationale for this thesis project and its relevance to communicators today.

Chapter Three: Benjamin Franklin as Technical Communicator

This chapter surveys existing scholarly research on the strengths of Franklin's writing, and looks for the ways in which Franklin employed rhetorical techniques. Franklin's mastery of stasis, tone and persona, document organization, and sentence structure are discussed, and

pertinent examples are provided. I also briefly review Franklin's background as printer and his scientific interests to provide some context to his writings.

Chapter Four: Thomas Jefferson as Technical Communicator

This chapter is constructed in similar fashion to Chapter Three, but focuses on Jefferson's technical writings. I explore Jefferson's talent for data presentation and layout, content organization, metaphor and imagery in these works. I also discuss the influence of Jefferson's belief in the importance of reason and practical application to research, as well as his dedication to collecting detailed technical information of all kinds, on his writing compositions.

Chapter Five: Conclusion

The findings of the rhetorical analyses presented in Chapters Three and Four are summarized in the final chapter of this thesis, and the project's original research questions are revisited in light of these results. I consider the potential benefits of historical study to contemporary technical communicators, and suggest further opportunities for additional research.

CHAPTER TWO: LITERATURE REVIEW

Introduction

As technical communication has matured as a profession and its research and theory has expanded, scholars continue to explore the field from many different angles. Additionally, "scholars have searched for ways to connect the research, teaching, and practice of technical communication to broader democratic and human concerns" (Ornatowski and Bekins 252). The profession's preparatory curricula have been shaped for nearly a century by changing philosophies on the correct balance of rhetorical theory and practical skill training (Wright et al. 448; Spigelman and Grobman 52). In the early periods of professional development, academic preparation focused on "systematic" rules of successful communication (Connors 9; Cook 5). Grammatical rules, mnemonic devices (such as the "C's of Communication"), and other prescriptive axioms supplanted the influence of rhetorical theory in professional communications; effecting, as John Hagge described it, "the reduction of writing from a highly complex sociolinguistic act…to a self-generated internal process of mentally representing meaning" ("Early Engineering" 441-2; Williams and Colomb 10-12). Technical communication instruction had evolved to emphasize objectivity in the desire for clear and efficient communications, and encouraged communicators to remove themselves from view as authors in an effort to focus on the content discussion. Then, in the 1960s, the profession began questioning its own identity, considering additional factors, such as ethical implications, beyond the instrumental basics of technical discourse (E. Smith 217; Dombrowski, *Ethics* ix; Katz 207-8). Scholars noted that subjective writers (in other words, all humans) are incapable of producing objective communication, and to attempt to deny this inherent subjectivity not only hinders the

impact of communication, but also conceals potential bias (C. Miller 613-4). In an effort to sound objective, writers often resorted to the third person point of view and action-less descriptions, creating wordy, convoluted sentences. Documents designed to present content at arm's length failed to be as successful as more humanistic approaches, because they alienated the reader (Malone 336; C. Miller 617; Tebeaux, "What Makes Bad" 74-5).

Today's view of technical communication is a more hybrid conception, acknowledging the generally utilitarian purpose and "instrumental" nature of technical discourse, but nonetheless appreciating its rhetorical, subjective aspects as well (E. Smith 194; Jones, *Technical* 6; Bitzer 4; Moore 223-4; Hagge, "Ethics" 468). As we have progressed into the twenty-first century, research and theory in the field has expanded to recognize both the social and the technological influences on today's practice, and much of today's scholarly literature is concerned with determining how to incorporate these sometimes opposing elements in successful practice and preparatory curricula. Scholars have pointed to applicability of Franklin's and Jefferson's writing in seeking a more balanced approach to technical communication. Though Franklin has been recognized "America's first great philosopher," Jeff Todd also notes that "[w]e should not underestimate his talents as a writer…[and m]any of [his] works fall under the head of technical writing" (73; Hume as qtd. in Levinson 270). Jefferson has also been recognized as a "good writer" with a passionate interest in science, who felt that "breadth of learning was always to supplement technical competence" (Nichols 149; Cohen 63; E. Martin 27).

The purpose of this chapter is to provide an overview of the scholarly literature in technical communication that is pertinent to this study, to provide suitable context for understanding the ways in which historical study can benefit today's communicators. I first review influential movements of the twentieth century — plain language, positivism, and

humanism— that particularly relate to Franklin's and Jefferson's writing styles, and then explore how the current view of technical communication combines elements of these philosophies into a more hybrid approach. The coincident changes to the role and influence of the technical communicator in the workplace support this combined approach, but complicate the process of finding a balance between the theoretical and practical knowledge needed for successful practice. I briefly discuss these changes, along with the benefits of historical study in determining this newfound equilibrium. Finally, I discuss the relevance of studying the historical works of Franklin and Jefferson in particular.

Contemporary Evolutions in Technical Communication

Many philosophical trends are responsible for shaping modern technical communications, among them the plain language movement, positivism, and humanism. A familiarity with these trends and their influence on contemporary practice provides a helpful context in understanding the evolving role of the technical communicator today and the value of historical study to this evolving practice.

The Principles and Influence of Plain Language

In the 1990s, the United States government put forth initiatives to simplify the language of government documentation according to the principles of the plain language movement (Mazur 205). The goal was to make legal records, technical papers, regulations, and other government documents easier for the average citizen to understand, in line with the belief expressed by David Dobrin that "technical writing's greatest success comes when it is swallowed

easily and digested quickly" (121). The desire for simpler language in technical documentation is centuries old; many speculate that the plain style may first have been adopted by scientific writers in an effort conform to the guidelines prescribed by the Royal Society of London, which fostered and shaped early scientific study in the 1600s (Tillery 278; Atkinson 364-5). Elizabeth Tebeaux traces the roots of the plain style even farther back to the year 900, claiming that widespread illiteracy, rather than refinements to the scientific method, led to the development of a plainer, easier-to-understand style ("Pillaging" 166, 192). Regardless of the exact origins, support for a plainer, more conversational style of writing found a foothold in the scientific awakening of the 1600s, as it became clear that "[t]he ornate style…too often led to obscurity and verbal games rather than clarity and the pursuit of truth" (Whitburn et al. 349).

The goal of plain language is to distill content and add structure in order to make documents easier to understand and navigate, and therefore more likely to be used (Tillery 281; Schiess, "What Plain English" 54, 73). Although it is sometimes criticized as a "dumbing down" of communications, plain language is not a prescriptive style and does not mandate the use of elementary-level words or syntax. Rather, it encourages communicators to write in a "style that reflects an accuracy and simplicity appropriate to its subject" (Rosner 38). In the plain style, communicators use section headings, clear typeface, visual aids, and active verbs, in addition to shortening or simplifying their prose as much as possible, to guide their reader and make their intended meaning less ambiguous. This, Irving Younger notes, can create a more persuasive document by giving communication "clarity of focus" (32).

The Principles and Influence of Positivism

Francis Bacon's advocacy of standard methods to practice science gradually gave way to a more standardized and less personal way of communicating about science. Bacon's followers believed that empirically derived knowledge could be relied on as fact, and they attempted to create an entirely "clear" language that would convey this information from observer to reader as transparently as possible, "represent[ing] the world of nature as directly as mathematical signs represent the universe of mathematics" (Rutter 26). They were unable to achieve this ideal, and the progressive efforts to focus on content caused scientific and technical communications to sound increasingly detached until they reached an "extreme 'non-narrativity' in the modern period" (Atkinson 354). This trend was reinforced with the increased participation of non-aristocrats and emergence of specialized subjects in scientific research in the nineteenth century. Aspiring scientists of this time rejected the old, exclusionary "gentleman's science," established by the Royal Society of London, that favored presenting information in letter form to emphasize the reputation of the researcher. Instead the up and coming scientists shifted the focus to "methodology…[as the] ultimate source of power and authority," and related their findings in an objective manner that deemphasized their own ethos (Atkinson 365-6). This approach to science and scientific communication came to be known as positivism. As David Locke observes, in this approach to communication, "[a]ny trace of the author is considered accidental; any influence on readers, other than influence on their knowledge, is thought irrelevant" (13). Positivism continued to dominate scientific and technical communication into the twentieth century and came to be commonly known and defended as the "rhetoric of science" (Walzer and Gross 430; Gross 5, 202-3, 206). Communicators were trained to present content as objectively as possible "by using passive voice, nominalization, and personification," and any interpretations of data

were considered obvious conclusions that naturally bubbled up into view (Malone 336; Dobrin 111).

At its best, the positivistic approach to scientific and technical communication gives rise to an accepted form of discourse that enables a broader sector of the population to participate, "overcom[ing] physical and temporal distance, disparities of experience and background, and the absence of a shared national language" among professionals around the world (Charney 577). Even if complete objectivity is unattainable, supporters point out that the use of standard forms of testing and presentation facilitates discussion and analysis, which allows for critical review of research and findings (Charney 573, 591; Hagge, "Ethics" 467-8, 473). There are negative consequences of the positivist approach to communication though, however unintended. The privileging of empirically-derived information can allow science to become a "god-term" and obscure the ways that human thought and perception shape the information presented (Harris 282). Taken to the extreme, Steven Katz warns, the positivistic dedication to objectivity and detachment from personal emotion can foster actions as hideous as those of the Nazis during the Holocaust (197). In more moderate circumstances, technical communicators' attempts to decrease their visibility lead to wordy text and cumbersome sentence structure, and severely hamper the readability of their documents (Brogan 4; C. Miller 617; S. Locke 102). Ironically, the positivists' intention to create clear, informative communication actually results in dense and awkward text that cannot be "easily heard, easily read, and easily spoken" (Atkinson 361; Tebeaux, "Pillaging" 193).

The Principles and Influence of Humanism

The most crippling blow to the positivist style of scientific and technical communication was perhaps the publication of Carolyn Miller's paper, "A Humanistic Rationale," in 1979 (E. Smith 205-6, 209). Miller challenged what had become the deeply entrenched belief that good technical communication should be written objectively, with as little human influence as possible. She rejected this approach in the belief that our ideas cannot be separated from our words, and that scientific and technical "facts" are necessarily influenced by the human lens with which we observe them (611). In this perspective, "[g]ood technical writing becomes, rather than the revelation of absolute reality, a persuasive version of experience" (C. Miller 615-6). In other words, if humans have inextricably subjective natures and are unable to avoid influencing the communications they construct, then scientific and technical communications, like all other forms of communication, are in essence subjective and rhetorical (C. Miller 615). Quite simply, Miller's argument put forth the theory that "[t]echnology cannot exist outside of a humanistic framework" (Knievel 80).

The impact of this assertion on modern technical communication, which came to be known as the humanist view, cannot be overstated. Over thirty years later, "A Humanistic Rationale" remains popular and is perhaps the most frequently cited source in technical communication literature; her thoughts are so prevalent now that they are sometimes repeated as commonly held beliefs and no longer cited (E. Smith 194, 196-7). The humanist belief in the communicator's ability to shape and influence even the plainest technical document gives rise to an entirely new set of implications for professionals to consider. If choices (deliberate or otherwise) are made by the writer in how content is presented and described, the ethical ramifications of those choices must be scrutinized (Spigelman and Grobman 54-55). The role of

the audience becomes a factor as well, as their interpretation also shapes the meaning of discourse. Dorothy Winsor observed that even technical reports, construction plans, and mechanical specifications, for example, are representations of reality that require some level of interpretation by the reader (352-3). Because humans, and not inanimate objects or theories, drive meaning in the humanist view, "language does not just communicate information, but it also creates a social reality and reproduces a system of shared values and meanings" (Winsor 355; Lipson 7). This, then, creates a fundamental shift in technical communication, "displac[ing] the focus from the clarity and correctness found in earlier studies to a wider focus on complex, critical theories of language, ethics, and culture" (Dombrowski, "Evolving Face" 307).

Critics of the humanism movement contend that Miller's argument exaggerates reality in many instances and that, rather than being practically useful, the claim to rhetoric in technical communication is more of a power play to gain academic prestige (Hagge, "Ethics" 464; Moore 213; Charney 569). Patrick Moore, for example, argued that "[o]veremphasizing the rhetorical, literary, and creative aspects of technical communication ignores what is socially useful and humane about the instrumental aims of technical communication" (as qtd. in E. Smith 194). Detractors also assert that, though the possibility of hidden bias exists in the use of the third person voice and passive verbs, this should not automatically be inferred and, moreover, such stylistic choices do not automatically make effective communication impossible (Charney 578, 580). Although it is almost universally acknowledged today that technical communication carries some level of subjectivity, critics of the humanistic view feel that its emphasis on ethics is inflated and its assumption that objective language conceals negative intent is prejudicial (E. Smith 203-4; Hagge, "Ethics" 470; Moore 219, 223, 231).

Reconciling Extremes in Contemporary Technical Communication

In the twenty-first century, Michael Knievel claims, professionals within the field "have reached the goal" of recognizing the humanistic qualities of technical communication, but the question of how to "rehabilitate 'instrumental discourse'…[and still] accommodate technology" remains a subject of debate (65, 80-81). The proper balance of rhetorical grounding and technological skills in proportion to one another for successful practice and effective curricula has been vigorously discussed by scholars such as Patricia Sullivan and James Porter, Candace Spigelman and Laurie Grobman, Linn Bekins and Sean Williams, Patrick Moore, and others. On one end of the spectrum, some scholars favor a greater focus on creativity, problem solving, and ethical awareness, so that communicators can approach a wide variety of workplace contexts with agility, and are encouraged to think "expansively" of their role as communicators (E. Smith 206, 208; Moeller and McAllister 188; Kim and Tolley 382). Others defend the fundamental utilitarianism of technical communication and emphasize the need to focus on grammatical and software skills that have a more direct application to industry assignments (Moore 232; Pringle and Williams 363). At the turn of this century, Loel Kim and Christie Tolley declared that "[t]hese days students need to master some level of technology as an expected standard literacy" (382).

Increasingly, though, these two points of view are coming to be seen as "equally important" and less in opposition to one another (Lanier 51; Spigelman and Grobman 52-3). This may partially be in response to the evolving role of the technical communicator in the workplace and changing concept of what it means for professionals to be "business-ready" (Kim and Tolley 376; Malone and Wright 42; Conklin 210). Although there was concern in the recent past that technical communicators were being reduced to "tool jockeys," it seems instead that

professionals are becoming more involved in the creation process and in "bringing together disparate groups [within a project team] to negotiate and achieve consensus" (Davis 139; Conklin 211, 227). Carol Lipson notes, then, the importance of the communicator's ability to optimize language for a given context: "Technical communicators…step in as advisors to solve and prevent common problems…An understanding of the place of language in a specialist's culture should inform a technical communicator's strategies and actions in such situations" (18). In this scenario, it is as equally important for communicators to understand the culture and outlook of the scientific and technical fields they work within, as it is for them to guide the development of communications in these fields towards greater effectiveness.

The Applicability of Historic Study

The "quickly evolving state" of the technical communicator's role, combined with ever-advancing globalization and changes in technology, increase the challenge of identifying the critical competencies for communicators today (Kim and Tolley 376; Schnakenberg 65; Davis 139). Many scholars in the field, including Malone, Todd, John Brockmann, Elizabeth Tebeaux, Paul Dombrowski, Carolyn Rude, and David Wright, consider the study of historical communications helpful and relevant for the insights they offer to students and practitioners alike. Reviewing communications of the past can provide an analytical perspective on current style trends, and provide practical examples in the use of imagery, metaphor, arrangement, ethos, and audience adaptation (Todd 65; Malone 343-4). Historical works can also suggest considerations that are not commonly discussed in current practice, such as energy and rhythm, but may prove useful in creating engaging prose "without departing from scientific validity" (W. Miller 76). Amid the present developments in industry and culture, Linn Bekins and Sean

Williams claim that the successful communicators of tomorrow will be "those who can create compelling narratives or possess the ability to see patterns and opportunities," pointing to the perennial importance of language, even in a society fascinated by technology (287-88).

The Relevance of Franklin and Jefferson

Franklin and Jefferson are recognized as ideal communicators in history whose works are worth studying today (Arnold 16; Gresham 12-13; Padover x; Cohen 109). Eleanor Berman and E.C. McClintock, Jr. praise Jefferson as "a modern in all times," (8) and Arnold Mulder definitively states that "[s]tudents in composition need no other teacher in writing than Franklin" (480). Though they used very different styles, each effectively applied rhetorical principles to their technical writing, and demonstrated a command of format, language, and persuasive techniques (Hodgson 643; Tebeaux, "Franklin's *Autobiography*" 342; Gresham 10; J. Martin 80; Davy 582).

Although their writing echoes the principles of plain language, positivism, and humanism which shape modern communications, Franklin's and Jefferson's place in history ensures that they bring a considerably different perspective to modern practice. Both men valued empirical testing and believed in the ability of scientific study to uncover truths, but they did not construe this respect for scientific research to mean that they, as scientific writers, should refrain from shaping content (Atkinson 356-7; Lyons 4; Tebeaux, "Franklin's *Autobiography*" 343; J. Martin 81). Perhaps because Enlightenment-era technical communicators were more obviously visible to their readers, shaping a document for persuasive purposes was not considered suspicious, but expected. Wilbur Howell writes that "Jefferson saw no contradiction between logic, taste, and

brevity, on the one hand, and perfection in the art of persuasion, on the other" (484). Franklin, too, styled his communications such that they "retained a persuasive edge" (Gresham 6).

Additionally, Franklin and Jefferson infused their technical writing with personal humor and emotion, respectively, despite their focus on utility (Gresham 10, 12-13; E. Martin 13-14). They focused on writing in terms that their reader could appreciate, and they wrote in an era when technical writing was still allowed to be "interesting" and have "beauty" (Lupton 180; Rosner 39-40). The survival and continued success of their works offer a helpful precedent for modern communicators who wish to infuse their work with the "style" and "eloquence" that Franklin and Jefferson employed (Tebeaux, "Franklin's *Autobiography*" 348; Cillerai 60).

Conclusion

The scholarly literature in technical communication over the past fifty years has reflected a continuous progression in the concepts of successful technical communication, and of the role and influence of the communicator. As emphasis has shifted away from focusing on content above all else to focusing on the needs of a human audience, it is arguably even more critical to consult successful works in history that were designed to engage a human audience. Dombrowski observed that "as travel to other countries allows us to better appreciate and understand our own society, so can the study of past thinkers help us to develop our own thinking" (Ethics 12-13). The values and viewpoints of technical writers in the Age of Enlightenment are well-positioned to speak to the current concerns and questions of the profession.

CHAPTER THREE: BENJAMIN FRANKLIN

Introduction

Circa 1768, Benjamin Franklin proposed an updated version of the Lord's Prayer in which he left the original meaning intact but modernized its language. Though not a technical document, Franklin's philosophy towards writing in general is apparent in this piece. Franklin chose more modern words and simplified each sentence, streamlining the prose while still preserving its melodic rhythm. He also made minute changes to reduce ambiguity, guiding readers to his own interpretation of the text. For example, Franklin revised the phrase "And lead us not into Temptation" to "Keep us out of Temptation" (*Writings* 641). This small change in verbs reflects Franklin's belief that God does not challenge humans with temptation, but rather delivers them from it (Franklin, *Writings* 640-41). These edits clearly demonstrate Franklin's attention to detail and his awareness of the impact that seemingly minor choices in composition can have on an overarching message. His revision of the Lord's Prayer offers a snapshot view of his appreciation for practical, yet elegant, language and his dedication to delivering the clearest message possible.

This chapter explores Franklin's strengths as a writer, particularly focusing on his approach to scientific and technical communication. Franklin believed that scientific study was beneficial to society (this was not a forgone conclusion in his era), and he intentionally styled his scientific writing to appeal to his audience and win their interest. In the discussion that follows, I briefly explore Franklin's philosophy toward writing and the aspects of his life which shaped his writing style, and I examine several of the elements that contribute to its effectiveness. In particular, I focus on Franklin's success in engaging his reader through the use of stasis, tone and

persona, document organization, sentence structure, and word choice. Finally, I consider how Franklin's approach to technical communication compares to modern practice and philosophy.

Background

By trade, Franklin was a newspaper publisher, first owning the *New-England Courant* newspaper, and later, the *Pennsylvania Gazette* (Lemay, *Writings* 1471, 1474). He received very little formal education, but conducted extensive studies on his own; for example, he taught himself to write by studying articles in *The Spectator*, a popular journal of the day (Mulder 482; Arnold 16; Lyons 25). His interests truly knew no bounds — he was fascinated by all manner of subjects that offered practical improvements for daily life, explored natural phenomena, or advanced intellectual knowledge. His interest in natural philosophy was evident from an early age, as he kept himself occupied while aboard the *Berkshire* as a young man by recording meteorological observations and studying the various sea life and birds he encountered (Lyons 22-3). He taught himself several foreign languages in order to follow the discussions of natural philosophers in Europe, and translated their theories and advancements for American audiences in his *Gazette* and *Poor Richard's Almanack* (Lemay, *Writings* 1474-5; Lyons 95). In fact, Franklin placed as much importance on the communication of scientific ideas, as in the ideas themselves (Gresham 5; Lupton 179). He believed in the power of technical communication to help advance scientific research: "[E]ven short hints and imperfect experiments in any new branch of science, being communicated, have oftentimes a good effect…By throwing our occasional thoughts on paper, we more readily discover the defects of our opinions, or we digest them better, and find new arguments to support them" (Franklin as qtd. in Gresham 12).

At his core, Franklin was a pragmatist. Whether proposing improvements to the postal system, touting the benefits of fresh air, or mapping the extents of the Gulf Stream, Franklin was driven to find improvements to daily life and was guided by the philosophy that knowledge always has practical benefit (Lyons 5; Levinson 271; Campbell 254-55). In his own words, Franklin declared that "all philosophical Experiments that let Light into the Nature of Things, tend to increase the Power of Man over Matter, and multiply the Conveniences or Pleasures of Life" (*Writings* 296). His approach was influential too (Lyons 17). Before Franklin, experimenting with electricity was not a serious subject of study (Campbell 52; Cohen 60). With his invention of the lightning rod, Franklin justly became known as the "founder of electrical science," and won "the first major and large-scale vindication of the Baconian thesis that advances in true knowledge would lead to practical innovations" ("Benjamin Franklin" 3; Cohen 290).

Strengths of Franklin's Technical Communications

Franklin's technical writing was also practical and influential (Campbell 4). He employed many rhetorical techniques to create documents that were effective in reaching their audience, and therefore had practical value. He also applied the lessons he learned as a newspaper publisher, particularly that successful communications are equally informative and entertaining (Leonard 455; Lyons 51). Franklin created approachable and effective technical communications by establishing a persona that appealed to his readers and by carefully constructing the components of his arguments for persuasive success. He was conscious of the impacts that tone and language, stasis, order, and syntax have on persona and persuasion. These features of Franklin's technical writing are explored in detail below.

Use of Tone and Voice to Develop Persona

Aristotle claimed ethos to be the most powerful tool to persuade an audience, and the success of Franklin's scientific and technical writing is undoubtedly due in part to his mastery of tone and persona (Beason 326). Franklin had a gift for creating consensus, and in his writing, he accomplished this in part with his choice of tone and style (Lane 42). His characteristically folksy tone has been seen by some as "shrewd" and "smug," particularly to those who have studied his *Autobiography* (Tebeaux, "Franklin's *Autobiography*" 341; Rivers 35). He took artistic license in writing his life's story, exaggerating some details and omitting others, which has made some scholars uncomfortable with the intentions behind his seemingly unassuming tone (Fichtelberg 209; Griffith 79). Others have concluded that Franklin's desire to improve access to information was genuine, and he used rhetorical techniques in an effort to create the most engaging, effective communications possible (Rivers 35; Griffith 79). Franklin did indicate that he consciously endeavored to present his ideas in a non-confrontational manner, finding this approach to be the most persuasive: "I made it a Rule to forbear all direct Contradiction to the Sentiments of others, and all positive Assertion of my own…[and] I soon found the Advantage of this Change in my Manners…The modest way in which I propos'd my Opinions, procur'd them a readier Reception and less Contradiction" (sic) (*Writings* 1393). Franklin used this approach in his letter on "Sound" to Oliver Neave: "…you speak of the air as 'the *best* medium for conveying sound.' Perhaps this is speaking rather too positively, if there be, as I think there are, some other mediums that will convey it farther and more readily" (sic) (*Writings* 792). Franklin continued by giving a substantial amount of information to the contrary for Neave to consider, styled in the form of rhetorical questions, and then concluded once more in a humble

tone: “I have not made up my own mind on these points, and only mention them for your consideration, knowing that every subject is the better for your handling it” (*Writings* 794).

Franklin wrote most often in the first person, regardless of whether he was writing a letter, newspaper article, or pamphlet, to create a personal connection with his audience and establish trust. But he used the third person strategically to make bolder statements or to enable simpler and more action-filled sentences. His use of the third person in his commentary on the library system he created, for example, allowed him to craft a more direct sentence and to also express his opinion as if it was established truth: “These libraries have improv’d the general Conversation of the Americans, made the common Tradesmen and Farmers as intelligent as most Gentlemen from other Countries, and perhaps have contributed in some degree to the Stand so generally made throughout the Colonies in Defence of their Privileges” (sic) (as qtd. in Tebeaux, “Franklin’s *Autobiography*” 345). Franklin claimed the revolutionary importance of the library system as a forgone conclusion, not as his personal theory. This skill at making his own thoughts seem to be universally held view, combined with an ever-amiable tone, resulted in highly persuasive communications (Fichtelberg 213-4).

To complement his approachable tone, Franklin used common, simple words in his writing and limits the use of adjectives and adverbs. These choices contributed to an “earthy” style of writing, in which Franklin was as likely to use a technical term like “evaporation” as he is to more colorfully observe that the river “has run up into the air” (Tebeaux, “Franklin’s *Autobiography*” 343; *Writings* 778). Franklin’s own description of his approach to word choice is as follows: “To be good, [writing] ought to have a tendency to benefit the reader…The words used should be the most expressive that the language affords, provid’d that they are the most generally understood. Nothing should be expressed in two words that can be as well express’d in

one…" (as qtd. in Arnold 18). He added expression to technical documents with the use of active verbs and personification. In a letter excerpt on the "Tendency of Rivers to the Sea," Franklin wrote that the river itself "*runs* into the sea," "*communicate*[*s*] with the Chesapeake Bay," and "*loses* itself by *running* under ground" (sic) (*Select Works* 304-5). By using "specific and concrete" verbs and arranging his sentences to "use concrete agents as subjects," Franklin kept his writing from being dull (Tebeaux, "Franklin's *Autobiography*" 344-5; Tebeaux, "What Makes Bad" 74). In another example, Franklin used personification to not only deliver his message more efficiently, but to create a short, crisp sentence that grabs the reader's attention: "Sugar employs near one thousand ships, tobacco almost as many" ("Maritime Observations" 17).

Interestingly, Franklin did depart from conventional beliefs about jargon, frequently including technical terms in his writing and even introducing entirely new words that allowed him to more accurately describe the results of his research (Schiess, "What Plain English" 53). Today, we still use many of the electrical terms Franklin coined, including 'charged,' 'condense,' 'electrified,' and 'positive' and 'negative' poles (Gresham 8; Devons 1149). He avoided overwhelming the reader with the use of new or less familiar terms by taking the time to define his intended meaning, for example: "In our small experiments, we call this light and sound the electric spark and snap; but, in the great operations of nature, the light is what we call *lightning*, and the sound (produced at the same time, though generally arriving later at our ears than the light does to our eyes) is, with its echoes, called *thunder*" (*Complete Works, 1767-1772* 41). He also used this same approach for more common terms that may be open to interpretation: "What is it, then, which makes a *smoky chimney*, — that is, a chimney which, instead of conveying up all the smoke, discharges a part of it into the room, offending the eyes and

damaging the furniture?" (Franklin, *Select Works* 322-23). By making an effort to define these terms, Franklin ensured they were not misunderstood or lost as senseless jargon, and allowed the reader to better understand his research in turn.

Use of Order and Syntax to Create Structure

Though Franklin broke with tradition in his tone and language choices, he complied with established rules and forms in his approach to order and syntax (Mulder 482; Gresham 6). He observed that good writing is based on "a regular plan and design," and he applied this principle to his writing on both large and small scales (Franklin as qtd. in Arnold 18). Franklin's paper, "Description of a New Stove for Burning of Pitcoal, and Consuming all its Smoke," published in the American Philosophical Society's *Transactions*, is one example of Franklin's skill in creating order and structure in his writing. The paper describes the design and use of a coal-burning stove that Franklin devised by improving upon older French and German designs, and the paper begins not only by describing these predecessors, but also providing a translated excerpt of a German stove design description, as the book is "scarce" (58). This background information is intended, as is the rest of the paper, to give the audience the most complete information with which to consider the use and benefit of Franklin's stove design. To this end, there is a great deal of detail in this paper, and it is all organized into a logical order of sections: the aforementioned historical background, a description of Franklin's new and improved model, detailed descriptions of its parts, instructions for use, and instructions for repair (61-5). Each section is preceded by a centered heading, and the descriptions and dimensions of the stove components, the instructions for use and repair, and the advantages of use are all provided in list form (62-3, 67-8). Franklin also included 20 diagrams, each extensively labeled, illustrating various aspects of the stove, its

components, and tools (61). Throughout the piece, Franklin made it easy to locate the information of interest, and managed the extensive amount of detail with thoughtful attention to structure and order.

In many of his papers, Franklin separated his points into numbered lists. The entirety of his paper on the Aurora Borealis, presented to the Royal Academy of Sciences in Paris, is organized as a numbered list. Franklin began by considering the basic properties of air when it is heated, and proceeded through each numbered point, considering the resulting effects on clouds, particularly in the winter, and building logically with each step until the idea of a "great quantity of electricity brought into the polar regions by the clouds," which produce the northern lights effect, can be easily imagined (*Complete Works of Benjamin Franklin, 1776-1779* 263-68).

On a smaller scale, Franklin's attention to order is evident in his syntax. Tebeaux has stated that "[t]he structure of the English sentence is critical, and...[follows] the basic subject-verb-object pattern. Text that veers away from this form becomes difficult to understand" ("Pillaging" 181). Franklin strictly observed the rules of subject-verb-object order in English syntax, which allowed him to write in a lengthy narrative style and avoid excessively short sentences that seem elementary or mechanical. For example, in his letter on "Maritime Observations," Franklin wrote: "Those mathematicians who have endeavoured to improve the swiftness of vessels, by calculating to find the form of least resistance, seem to have considered a ship as a body moving through one fluid only, the water; and to have given little attention to the circumstance of her moving through another fluid, the air" (sic) (2). This is a long, fifty-three-word sentence and not a simple one, with a semicolon and multiple phrases separated by commas. Nevertheless, it is readily understandable. The subject ("mathematicians"), verb ("have endeavoured"), and object ("the swiftness of vessels") are kept close together in the first portion

of the sentence, and a parallel set of phrases separated by commas (“,the water” and “,the air”) are used to create rhythm. This structure makes it easier for the reader to both understand and remember Franklin’s communication, making it more effective.

Building a Successful Argument with Stasis

In classical rhetoric, a rhetor looks for a point of commonality between two opposing points of view in order to construct a compelling starting point for his or her argument. This point is known as “stasis” (Crowley and Hawhee 71). Franklin used this ancient technique often in his writing to disarm the audience and encourage them to be more receptive to the information presented. “On Smoky Chimneys” begins in this way: “Those who would be acquainted with this subject should begin by considering on what principle smoke ascends in any chimney” (Franklin, *Select Works* 322-3). Chimneys and chimney smoke were a part of everyday life in Franklin’s era, and his readers would likely have had their own theories on the causes behind a malfunctioning chimney— and were likely to dismiss any information that Franklin presented to the contrary. In anticipation of this, Franklin immediately diverted his reader’s attention to a point from which he could safely build his argument. He acknowledged opposing viewpoints as common and understandable (“At first many are apt to think…”), and appealed to the reader as a rational person (323). When he deviated from commonly held opinions, he offered the results of “[a] simple experiment or two [that] may serve to give more correct ideas” (323).

Franklin used this aspect of his writing to make science feel accessible to his readers. Franklin’s presentation of the lightning rod to European audiences, in the paper “Of Lightning and the Methods (Now Used in America) of Securing Buildings and Persons from its Mischievous Effects,” begins by welcoming his readers to understand the mystery of electricity

as naturalists do: “Experiments made in electricity first gave philosophers a suspicion, that the matter of lightning was the same with the electric matter. Experiments afterward…have since proved this suspicion to be perfectly well founded; and that whatever properties we find in electricity, are also the properties of lightning” (40). This is clear and understandable to a person with no scientific knowledge and soundly conquers superstition by offering a stasis that the reader cannot argue with.

Franklin built upon the premises established by stasis with transitions that guided the audience to each logical point of reason, thereby encouraging them to agree with the conclusions he proposed. In a letter to fellow scientist Ebenezer Kinnersley known as “Fire in Bodies — Experiment,” Franklin separated each point of his discussion into its own separate paragraph, and used the first sentence of each paragraph to smoothly transition from the previous paragraph to the new one. The opening paragraph grabs the reader’s interest: “How many ways there are of kindling fire, or producing heat in bodies!...And yet the fire, when produced, though in different bodies it may differ in circumstances, as in color, vehemence, &c., yet in the same bodies it is generally the same” (sic) (*Select Works* 286). Once he established this intriguing starting point, Franklin proceeded through small, manageable points that his reader would accept, slowly transitioning to his argument: “If this should be the case, kindling fire in a body would nothing more than developing this inflammable principle…” (*Select Works* 286-87). As the reader is guided toward the argument’s conclusion, Franklin used the first person voice to establish camaraderie with the reader and suggest that he, too, was led to the same conclusion as they: “And thus <u>we</u> seem <u>led</u> to this supposition…” (emphasis mine) (*Select Works* 287).

Comparing Franklin's Writing to Modern Technical Communication

In Franklin's era, scientific demonstrations were a novelty. The fear and superstition which clouded the Middle Ages were beginning to lose hold as it became more apparent that natural phenomena could be explained (Lyons 4). But the practical benefits of science were not readily accepted, and Franklin encountered some opposition when experiment results challenged long-held notions. Therefore, in much of what he wrote, Franklin sought to demonstrate a kinship with his readers in order to effectively persuade them of his argument. With this objective in mind, he parted ways with many characteristics that frequently appear in modern technical communication. He did not often write short sentences and did not view personal asides as extraneous to the dialogue with his reader, both of which challenge the doctrine of plain language (Schiess, "What Plain English" 71). For Franklin, it was more important to provide sufficient background information and to show that he understood the reader's point-of-view. Plain language advocates advise modern writers to "[f]orget the windup; just make the pitch," but the "windup" was essential to the success of Franklin's argument (Goldfarb and Raymond as qtd. in Schiess, "What Plain English" 74).

Like the positivists, Franklin believed in the preeminence of scientific data and experimental results. However, the value of this knowledge is irrelevant, in Franklin's view, if the reader cannot be persuaded of it. The technical writer must write persuasively, then, in order to create an effective message. The choices Franklin made in his writing— active rather than passive verbs, the first person voice instead of the third person, the use of established rhetorical techniques— were designed to persuade the reader of his point-of-view. As a result, Franklin's technical communication substantially differs from the positivist style that dominated the

practice in recent history, and conforms more to the progressively humanistic approach in the modern era.

Conclusion

Although Franklin's writing espouses many of the principles favored in technical communication today, his is a unique style; its folksy tone is recognizably different from that of other writers of his era and also from modern writing. He interjected even the purest technical discussion with personal impressions and witticisms, and rather than detracting from his message, they enhance it. The continued influence of Franklin's writing makes a strong case for his emphasis on personal touch. His own era has been referred to as the "Age of Franklin" by historians for the wide-ranging impact he had on daily life then, and his work ethic, civic interests, and belief in the value of knowledge continue to shape the American culture more than 200 years later (Lyons 17; Levinson 270). Franklin's contribution to scientific study is significant; *Experiments and Observations on Electricity* "ranks among the most notable books on science of that age and of any other age" (Cohen 139). Franklin's writing serves as a challenge to modern communicators to humanize technical works, and to make their authorial persona more prominent. By first engaging and identifying with their reader, technical communicators can improve their reader's reception of the content they wish to discuss.

CHAPTER FOUR: THOMAS JEFFERSON

Introduction

It is difficult to create a readable description of boundary survey measurements. Yet Thomas Jefferson's book *Notes on the State of Virginia* ("*Notes*") begins by relating the geographical limits of his native state and the work does not suffer for it. Jefferson improved upon the basic information by adding descriptive detail, putting the measurements in context, and numbering the sources he references for added structure. The objects of interest are made the subjects of his sentences and described in almost storyteller fashion: "*Virginia* is bounded on the east by the Atlantic…" (sic) (*Complete Jefferson* 568). Jefferson added context to his recounting of numerical measurements, by explaining that "[t]hese boundaries include an area somewhat triangular of one hundred and twenty-one thousand five hundred and twenty-five square miles…This State is therefore one-third larger than the islands of Great Britain and Ireland, which are reckoned at eighty-eight thousand three hundred and fifty-seven square miles" (*Complete Jefferson* 568). The written numbers lend a formal feel that perhaps Jefferson felt was appropriate for a book-length piece. Yet despite this cumbersome detail, readers are able to easily navigate and understand the information, because it is presented in terms they can visualize. This brief beginning section to *Notes* illustrates on a small scale Jefferson's commitment to presenting technical communication in a way that upholds the principles of rhetoric and is accessible to readers.

The following discussion explores some of Jefferson's strengths as a technical writer. Throughout his life, Jefferson was engrossed in recording statistical data and drawing comparisons and conclusions from this information. He regularly documented many detailed

observations, including animal sightings, meteorological conditions, and crop records, and this habit clearly informed his skill in organizing and presenting information (E. Martin 18-22). It also made it possible for him to write the encyclopedic *Notes*, which has been praised as "probably the most important scientific and political book written by an American before 1785" (Peden as qtd. in Cohen 73). In this chapter, I first review pertinent aspects of Jefferson's background and interests that informed his technical communication, and then present the strengths of these works, before comparing his writing style to approaches that are more characteristic of communications in our era.

Background

Jefferson's approach to communication was heavily influenced by his background. He was born into a wealthy farming family and received a formal university education, studying law, rhetoric, and the classics (Thomson 4, 17; Berman and McClintock, Jr. 1; Cohen 71). Jefferson idolized Newton, Bacon, and the philosopher John Locke, owing to his penchant for studying scientific research and philosophy (Cohen 57). Jefferson imbued many of his writings with a sense of the "sublime," adding ethereal imagery that is unusual to technical communication, but proves highly effective in its ability to appeal to the reader's senses and ideals and compels agreement in much the same manner as Franklin's use of stasis (Holowchak 159). Though his appreciation of philosophy is evident in the tone of his writing, Jefferson always sought practical application for knowledge, and he believed in the ability of scientific research to improve daily life (E. Martin 36-7; Cohen 62). He was a constant "tinkerer" who devised clever gadgets, such as the mouldboard plow attachment and a polygraph copier, to ease the chore of everyday tasks (Cohen 61; C. Smith 8; E. Martin 106). As a result, Jefferson's

technical writing, like Franklin's, was poised "at the intersection of engineering and science" (Lyons 145).

Strengths of Jefferson's Technical Communications

Jefferson's style is much more reserved than Franklin's, and his tone can even seem lofty compared to Franklin's conversational style, yet Jefferson was no less effective as a communicator. Though "[s]ome have called the quality of ambiguity in Jefferson crafty and worse — the deliberate aim of being all things to all men," Max Lerner insists that Jefferson simply "wrote carefully …weighing his words for their impact on friend and foe alike" (45). Jefferson made observations from a bird's-eye viewpoint, but his writing is warmed by personal observations and experiences, and frequent emotion (J. Martin 81-2; Holowchak 159). In advice to a younger scholar on how to communicate effectively, Jefferson instructed: "Suit your arguments to the audience before whom it is supposed to be spoken. This is your last & most imp't exercise. No trouble should therefore be spared" (sic) (as qtd. in Berman and McClintock, Jr. 5-6). Jefferson used his talents for organization and observation, and his knowledge of rhetorical devices, to engage his audience and create effective communications in his own style.

Presentation of Data and Statistics

In his daily life, Jefferson gathered and analyzed various types of statistical data for his own enjoyment. As Keith Thomson remarked, "Jefferson went beyond simple observation. He understood the special value in a consistent series of temperature recordings for probing into the underlying patterns of climate, which exemplified the difference between recording weather as a

hobby and recording it as a science" (180). As a result of this dedication, Jefferson developed the ability to present information in ways that made the content accessible and easy to evaluate. He experimented with various types of arrangements in his technical writing, including tables and flow charts, and often created his own unique styles of presentation too.

When serving as ambassador to France, Jefferson sent many letters back to the United States, detailing scientific, diplomatic, and practical items that he observed or learned about (Thomson 149-50). In a letter to Dr. Philip Turpin in 1784, Jefferson provided an account in table form of the ballooning experiments he had witnessed. At the time, the principles of ballooning offered great promise for potential improvements in travel and began to be studied in a scientific manner (Holmes 125-26). Jefferson listed each of the seven experimental flights that he witnessed by date and location, and then used the rest of the table to list the various materials used, the distances traveled, and so forth, in order to enable his audience to easily compare the strengths and weaknesses of each design (*Writings* 795).

Jefferson's presentations of data are creative, and he wove this information into the rest of his text seamlessly. In a letter to his son-in-law, chiefly regarding financial matters of the day, Jefferson included statistical data on the number of banks in the United States, and the amount of capital held by each, some ten years prior. Jefferson did not simply copy this information into the letter for his reader to sort through. Rather, he totaled the capital holdings for the original banks, extrapolated the amount of money the increased number of banks in his present day would manage, and provided these totals side-by-side for comparison. In order to present this detail without any unnecessary titling or redundant introductory matter, Jefferson broke off mid-sentence, and resumed his discussion without disruption afterward:

> [The actual circulation of bank paper] may be tested, however, by a list of the banks now in the United States, and the amount of their capital. I have no means of recurring to such a list for the present day; but I turn to two lists in my possession for the years of 1803 and 1804.
>
> In 1803, there were thirty-four banks, whose capital was $28,902,000
>
> In 1804, there were sixty-six, consequently thirty-two additional ones. Their capital is not stated, but at the average of the others (excluding the highest, that of the United States, which was of ten millions), they would be of six hundred thousand dollars each, and add $19,200,00
>
> Making a total of $48,102,000
>
> or say of fifty millions in round numbers. Now, everyone knows of the immense multiplication of these institutions since 1804… (*Complete Jefferson* 364-5)

This arrangement is efficient, facilitates comparison, and does not interrupt the flow of discussion.

When the content warranted it, Jefferson merged different forms of data presentation together. For example, he organized his personal library according to Francis Bacon's "Faculties of the mind" theory, which proposed that all knowledge can be grouped into the categories of Memory, Reason, and Imagination (*1783 Catalog of Books* 10). Jefferson determined that these categories corresponded to the subject areas of History, Philosophy, and Fine Arts, respectively, grouped all of his books according to these three main subjects, and listed them in a uniquely designed catalog, as shown in Figure 1. Its combined table and flow chart design describes, in very few words, the organization of his volumes by subject area, and also provides a numerical

subject listing for quick reference. The flow chart design allowed Jefferson to list several levels of organization at a glance, and to convey the relationship of each subject to one another. The combination of the flow chart and numbered list maximizes the use of space, and encourages the reader's eye to move horizontally and vertically across the page.

Content Arrangement

Jefferson's understanding of arrangement also applied to the prose in his documents. This is perhaps best seen in *Notes*. This book was written in response to questions from the French government on the resources of Virginia, which were directed to then-former governor Jefferson by the Virginia delegation to Congress (Thomson 44-5). *Notes* became the only personal book Jefferson published and it gained him widespread fame throughout America and Europe (E. Martin 140). Jefferson recognized that the French government's request for information was an opportunity to promote the resources of America, and to refute damaging claims made to the contrary by the well-known French naturalist George-Louis Leclerc, Comte de Buffon (Thomson 11-13, 186). In earlier studies of the American continent, Buffon had suggested that the land could not support a thriving population, based on his observations on climate, animal species, and native peoples (Thomson 12). Due to his fame, Buffon's remarks had the potential to damage the economic growth of the new country (Thomson 12). In writing *Notes*, then, Jefferson was structuring an argument in response to Buffon, and he rearranged the order of France's queries, adding to their scope in several instances to "create a system...[that] serves an argumentative purpose" (Davy 584, 586). The French had first inquired about the political aspects of the state, then briefly asked about its natural and social characteristics, and concluded with economic questions.

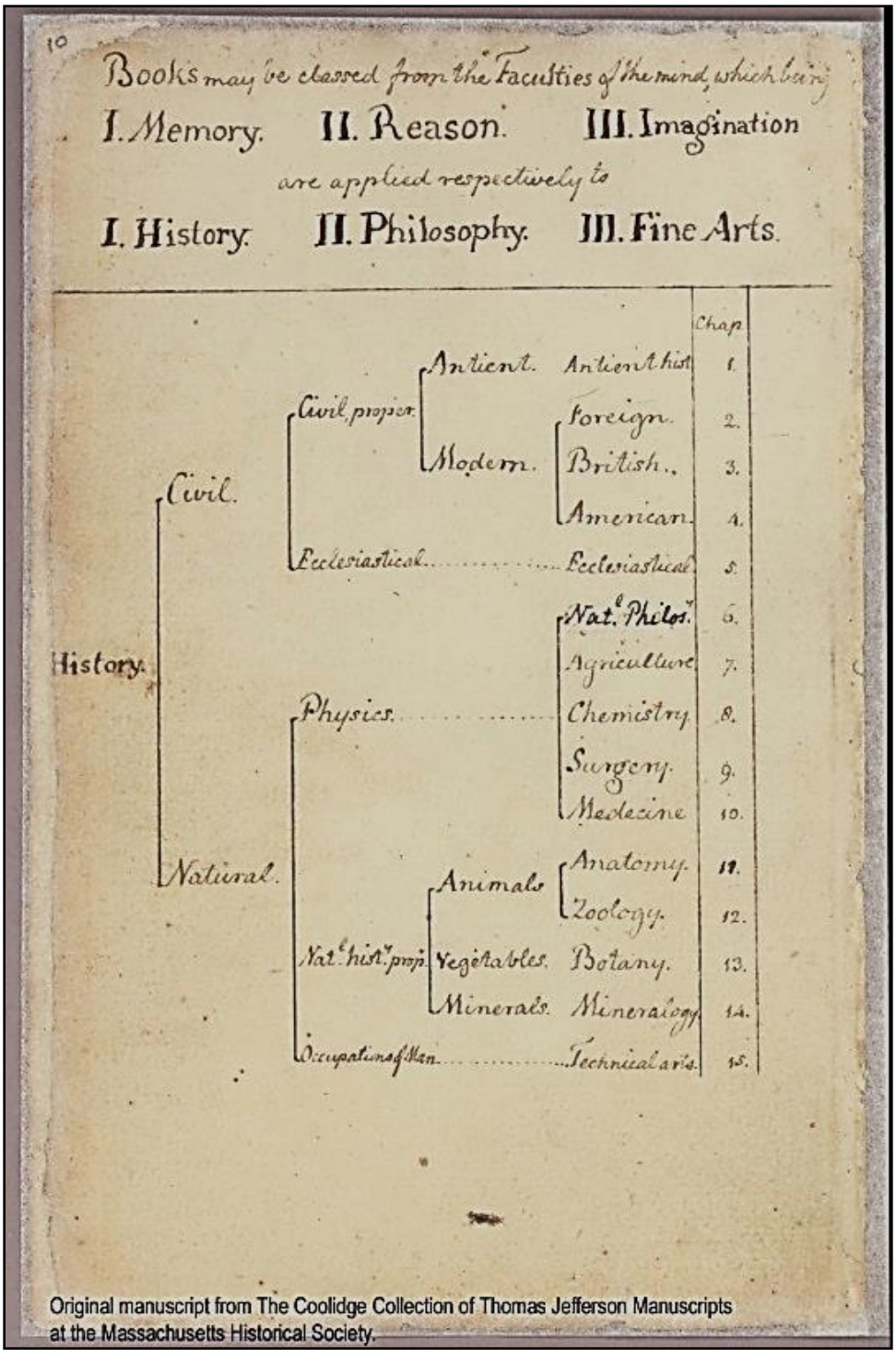

Figure 1. Jefferson's 1783 Catalog of Books, excerpt
Source: Massachusetts Historical Society
http://www.masshist.org/thomasjeffersonpapers

Jefferson, however, devoted almost the entire first half of the book to the state's natural wonders and attributes, using this "neutral" subject matter to lay the foundation for other, more controversial topics (J. Martin 81; Davy 585). Jefferson also used an interesting system of section headings in *Notes* to aid the reader in locating information of interest. The table of contents provides a simple, often one-word title for each query; within the text itself, however, he prefaced each query response with a longer, more descriptive heading. For example, Query II is simply titled "Rivers" in the table of contents, but its subject heading is expanded to "*A notice of its rivers, rivulets, and how far they are navigable*" (sic) within the text (*Complete Jefferson* 567, 569). Likewise, Query XX's general title of "Subjects of commerce" is more fully explained in the in-text heading: "*A notice of the commercial productions particular to the State, and of those objects which the inhabitants are obliged to get from Europe and from other parts of the world*" (*Complete Jefferson* 567, 679). In this approach, Jefferson first offered a brief title to suggest topics that may be of interest, and then prefaced the text with a longer, more descriptive heading to describe the specific information being presented.

Jefferson's instructions to Meriwether Lewis, prior to his Corps of Discovery Expedition with William Clark, also exhibit a creative approach to arrangement. Jefferson arranged his request for information in an interesting format that displayed full sentences in list form:

> Other objects worthy of notice will be
>
> the soil & face of the country, it's growth & vegetable
>
> productions, especially those not of the U.S.
>
> the animals of the country generally, & especially those
>
> not known in the U.S. the remains & accounts of any which
>
> may be deemed rare or extinct;… (sic) ("Instructions" 2-3)

Jefferson used tabs, line breaks, and punctuation to convey a great deal of detail without overwhelming his reader. He also arranged each line to place the requested items as close to the beginning of the line as possible, and used the rest of the line for supporting detail. This arrangement allows the reader to skim the paragraph and pick out the items of interest quickly, without being hampered by additional detail, and to consult the lengthier descriptive details when needed for clarification.

Jefferson's report to the American Philosophical Society, "A Memoir on the Discovery of Certain Bones of a Quadruped of the Clawed Kind in the Western Parts of Virginia," is another example of Jefferson's skill in arrangement, particularly in the logical order of its contents. The "Megalonyx" is an extinct animal whose remains were found in Virginia and entrusted to Jefferson for his scientific interest in the flora and fauna of his native state. Jefferson's report is intended to describe the remains found, and offer theories as to what the animal may have looked and acted like while living, and consider what may have led to its demise. Jefferson approached the task with exceptional thoroughness, first describing the circumstances of how the bones came to be discovered and sent to him, then itemizing each bone and describing its condition (246-8). He provided detailed measurements in tabular form, setting the "Megalonyx" measurements against those of an African lion for comparison (248-9). He offered his rationale for this method of analysis, and then began a thorough discussion of its fate and the probability of whether any such animals were still living, based on his inspection of the remains (251-8). The structure of "A Memoir" exemplifies the logical order and controlled examination of a scientific report today.

Language and Description

Although Jefferson's tone suggests that he is examining subjects at arm's length, he allowed philosophical wonder to be part of technical discussions. Andrew Holowchak observed that "Jefferson did not…divide claims of value from claims of fact" (142). For example, in a letter to Dr. John Manners, Jefferson discussed the need for an efficient classification system of organisms found in nature, but left room in this practical discussion for an appreciation of nature's artistry:

> Nature has, in truth, produced units only through all her works. Classes, orders, genera, species, are not of her work. Her creation is of individuals. No two animals are exactly alike; no two plants, nor even two leaves or blades of grass; no two crystallizations…This infinitude of units or individuals being far beyond the capacity of our memory, we are obliged, in aid of that, to distribute them into masses…[and] we fix arbitrarily on such characteristic resemblances and differences as…[are] most likely to take a strong hold in our memories. (*Writings* 1329-1330)

His love of nature and talent for description renders some of his technical communication as near-poetry. In his account of Virginia's rivers in *Notes*, Jefferson wrote, "The *Ohio* (sic) is the most beautiful river on earth. Its current gentle, waters clear, and bosom smooth and unbroken by rocks and rapids, a single instance only excepted" (*Writings* 133-4). The technical objectives of Jefferson's writing are not lost with the inclusion of these descriptions, and they draw the reader's attention, improving the effectiveness of his argument. In appealing to his audience's senses, Jefferson's writing enables the reader to feel the water of the Ohio River, see it, and even hear its waters rush. He understood the "power of the image" in persuading his reader to see

Virginia as he does; as Holowchak remarked, “the sublime leaves readers with a feeling of awe about America, the beautiful leaves readers with…a sense of unlimited potential for the new country” (159; J. Martin 82).

Jefferson also used metaphors and architectural terms to augment the imagery of his writing. In a letter to the English chemist Dr. Joseph Priestley, for example, Jefferson discussed the philosophical struggle to persuade his fellow citizens of the value of scientific research in visual terms and metaphors: “Our countrymen have recovered from the alarm into which art & industry had thrown them; science & honesty are replaced on their high ground… We can no longer say there is nothing new under the sun… The mighty wave of public opinion which has rolled over it is new” (*Writings* 1085-6; “Joseph Priestley” 1). He used architectural terms familiar to European audiences of his day to describe the awe-inspiring scale of Natural Bridge: “It is impossible for the emotions arising from the sublime, to be felt beyond what they are here: so beautiful an arch, so elevated, so light, and springing as it were up to heaven, the rapture of the spectator is really indescribable!” (*Writings* 148; J. Martin 82; Nichols 150). Jefferson also used such terms to great effect in more technical descriptions: “The arch approaches the Semi-elliptical form; but the larger axis of the ellipsis, which would be the cord of the arch, is many times longer than the transverse” (*Writings* 148). His familiarity with these terms allowed Jefferson to accurately describe this natural wonder without the benefit of a photograph. Though today’s communicators may be tempted to replace a written description with an image, Jefferson’s writing illustrates at least two benefits to supplementing images with well-designed written descriptions. The author’s description can guide the reader’s eye to particular features of interest that may be overlooked, and it can also convey a sense of experience beyond what can be seen in a two-dimensional photograph.

The use of architectural terms offers a practical benefit beyond the imagery they conjure, as their precise meaning allowed Jefferson to write a more efficient, and less wordy, description. He exhibited this balance of imagery and efficiency in process descriptions also. In a letter to the Rev. James Madison, Jefferson described the discovery of a new chemical which appears to be known today as hydrofluoric acid:

> Monsieur Bertholet, by dissolving silver in the nitrous acid, precipitating it with lime water, and drying the precipitate on ammoniac, has discovered a powder which fulminates most powerfully, on coming into contact with any substance whatever. Once made, it cannot be touched. It cannot be put into a bottle, but must remain in the capsula, where dried. The property of the spathic acid, to corrode flinty substances, has been lately applied…to engrave on glass, as artists engrave on copper…. (*Writings* 926; Wenzel and Eckmann 1-2)

Jefferson described the process of creating this chemical compound and its characteristic behavior in simple, rhythmic language. Each step of the process is also described in similarly constructed phrases that emphasize the action ("dissolving," "precipitating," drying") at the beginning of each phrase. This structure and word choice leads the reader through each step effectively, noting tactile observations within the steps ("powder"), and avoiding extraneous detail. He used short sentences and common words to describe the chemical's volatile properties and its uses, allowing readers with little or no familiarity with chemical reactions to easily follow his description and understand the applications.

Comparing Jefferson's Writing to Modern Technical Communication

In Jefferson's time, statistics and numerical data became popular for use in debates on political and social issues (Headrick 78-9). Reference works of the day reflected this trend with increased attention to organizational techniques that improved the efficiency with which information was presented and consumed (Headrick 172). This emphasis on document design of information has continued to be relevant, particularly as printing capabilities, computer processing, and software tools have expanded the options available to communicators today. Yet despite the comparable lack of resources, Jefferson's creative approaches to presenting data continue to offer fresh and original ideas to communicators today. His willingness to combine words and numbers, to break with traditional paragraph structure when the content warrants it, and to simply use tabs and columns to guide the reader challenges modern professionals to design a document to, first and foremost, to suit the needs of the reader and nature of the information of concern.

Although Jefferson's coolly efficient tone and style could not be more different from Franklin's witty, disarming charm, Jefferson is a persuasive writer in his own right. This is important to observe, as Jefferson's voice as a technical author is more similar to modern communications than Franklin's, particularly in formal settings. Though it would seem at first glance that Jefferson's preference for the third person indicates a viewpoint wholly in line with the views of positivism, Jefferson also included very personal observations and sensory descriptions when helpful for the needs of his audience. Jefferson would have felt that efforts to remove all trace of human involvement from scientific and technical communication were misguided, in much the same way that he criticized stoicism for "stressing merely the suppression of all individual passion…[rather than emphasizing the] development of …

intelligence, 'reason,' and moral sense" instead (E. Martin 65). Jefferson's writing reflects his goal of achieving a more balanced viewpoint, and exhibits a balance of subjective and objective, or humanistic and positivistic, elements.

Conclusion

Although Jefferson's role as the primary author of the masterful *Declaration of Independence* is always likely to overshadow any of his other writings, his technical works are also elegantly constructed and worthy of study. Eleanor Berman and E.C. McClintock, Jr. praised Jefferson's writing for "exhibit[ing] that rare combination of soundness of mind, ingenuity, and magnetic personality which serves to make him a modern in all times" (8). Catherine Smith saw him as particularly useful for modern communicators because of the parallel expansion of opportunities between our day and post-Revolutionary War America; as Jefferson and his contemporaries forged a new American identity in science and industry, so too are today's professionals engaged in "equitable, accessible, and pluralistic new global communications" (6).

CHAPTER FIVE: CONCLUSION

Introduction

The emotional, personal approach to natural philosophy in the Enlightenment challenges our conceptions of what technical communication must be. At first glance, writing from this era may seem charming but utterly disconnected from the present-day, unlikely to provide any meaningful guidance for our fast-paced, global scale communications. But Franklin himself dispelled this notion in his essay, "The Art of Saying Little in Much": "*Amplification*, or the Art of saying *Little in Much*, seems to be principally studied by the Gentlemen Retainers to the Law… You must abridge their Performances to understand them; and when you find how little there is in a Writing of vast Bulk, you will be as much surpriz'd as a Stranger at the Opening of a *Pumpkin*" (sic) (*Writings* 263). Despite the antiquated spelling and capitalization conventions that Franklin used, his commentary is wry, witty, and entirely applicable to much of the writing produced by a variety of modern professionals, not just lawyers. Franklin's clever pumpkin analogy surprises and amuses the reader, and the unexpected yet entirely fitting imagery makes his comment exceptional. Both Franklin and Jefferson were apt to use personal observations, emotional reactions, analogies, and metaphors in their technical writings, establishing "an effective refutation of the bald assertion, sometimes made, that scientific writers should avoid figurative language in their writing" (Malone 344).

In this chapter, I summarize the value of studying historical technical works and examine the characteristics of the Enlightenment of particular interest to communicators today. I also revisit the research questions that guided this project, examining the similarities and differences between Franklin's and Jefferson's technical writing and modern communications, as well as the

rhetorical techniques they use and the new perspectives they offer to today's communicator. Finally, I offer some potential avenues of further research in the historical study of technical communications.

The Value of Historical Communication

It seems that the shifting complexities of the technical communicator's role in the workplace, and the continuous changes in practice that are driven by technological improvements, are constants in themselves (Davis 143). A succinct definition of the scope of technical communications may not be attainable, which makes it difficult to form a consensus on the skills that every successful technical communicator should possess (Wright et al. 448; Cook 6; Rude 188). Moreover, the system of language that we use to communicate is susceptible to interpretation and shades of meaning; this system and the subjective nature of human beings make it impossible to create truly objective communications that will always be interpreted in the same manner (Dobrin 246). However, the pliable nature of our communications does offer the opportunity to appeal to and persuade an audience. In the case of technical communication, "we create information products to communicate effectively with audiences about technology using whatever tools best fit the situation" (Pringle and Williams 367).

This idea of subjective and malleable human communication formed the foundation of ancient rhetoric, and the principles of this enduring approach to communication are based on the belief that even the most impersonal-seeming information is shaped by human perception. Although there are few constants in the modes and styles of human communication throughout history, the principles of rhetoric were relevant in Franklin's and Jefferson's time, and they continue to hold true today. William Hart-Davidson remarked that "[w]e might think of the

canons of rhetoric as the basic operating system features of writing" (148). It is important for technical communicators to understand the ways in which information can be presented and shaped, not only to do their job effectively, but also ethically— two ideals which Aristotle felt "should not be in opposition but should actually enhance one another" (Bennett as qtd. in Spigelman and Grobman 52-3). Common workplace practice in recent history has not typically allowed for this dual focus, but as technical communicators today are given more opportunity to guide the design of communications, it is important that they understand their role and responsibility as rhetors (Conklin 227; Davis 139; Spigelman and Grobman 54-5). A familiarity with the basic tenets of effective communication can not only guide a communicator in the design of a document, but also in the increasing number of "interpersonal, collaborative, and team situations" encountered in the workplace (Lanier 52).

Revisiting the Research Questions: Franklin, Jefferson, and Modern Communication

Franklin and Jefferson offer several fresh perspectives to professionals today in various aspects of technical communication. In the Age of Enlightenment, the success of technical communications greatly depended on whether the author was able to convince the reader of his or her ethos as a trustworthy source of information (Atkinson 362-3). Readers of the day, particularly American readers of the Revolutionary Era, were developing a resistance towards imposed authority of all kinds, and it was important that writers in this era earn their audience's approval (Lyons 83). How writers presented information, then, was as important as the actual content they presented (J. Martin 78). Franklin and Jefferson often discussed their theories and presented their experimental results in letter form, which encouraged them to use the first person and write in a more direct manner (Atkinson 341). Establishing an appealing and sympathetic

tone and persona was important in engaging their audience, and it is important to note that the observation that "human beings do not respond to [impersonal] abstractions" continues to hold true today (Spence as qtd. in Whiteman 116). There was a great appetite in the Enlightenment for statistics, numerical data, and experimental results, but writers framed this information with their own sensory impressions and emotion, making it clear that subjectivity and objectivity needn't be so at odds (Headrick 78-9; Holmes xvi).

Franklin and Jefferson also offer an interesting view of how rhetorical principles may be incorporated into technical discussions for practical effect. Although Jefferson tended to write in a more formal tone than Franklin, both created documents that are far more personal than much of the technical documentation created today. Even though they wrote about their own endeavors and were not tied to a larger corporation, as many modern communicators are, they wrote to appeal to the senses of the reader, which can still be practiced. They used rhetorical devices such as stasis, ethos, pathos, and arrangement to engage their reader and persuade him or her of the worthiness of the information they present. Franklin's mastery of ethos helped him create an approachable and charming persona who understood the perspective of the readers, and gave credence to their concerns before presenting a new and helpful solution. He also had a talent for creating interesting sentences that were well-structured, allowing the reader to readily understand the content of his writing, even though it was not presented in simple or sparse prose. Jefferson's skill in arranging information enabled him to present a great deal of detail to the reader as well in a readily understandable way. He structured his documents to build arguments that would appeal to his reader, and he frequently used imagery to create a common point of agreement with his audience. Both Franklin and Jefferson were driven in their work to find efficient, practical solutions to the challenges of everyday life, and they believed in the existence of scientific truth,

waiting to be discovered by experiment. Their use of rhetorical devices such as ethos, arrangement, logos, pathos, and stasis served a practical benefit, as they allowed Franklin and Jefferson to appeal to their very human audience and produce successful communications as a result.

There are also several key areas in which the influences on Franklin's and Jefferson's work were different from the present day, and therefore shaped writing styles that differ from the traditional style of scientific writing that we are more accustomed to today. As modern science and technology was in its infancy in the Enlightenment, subject areas were not strictly categorized and formal programs of study were not mandatory, so self-taught enthusiasts could pursue experiments, and garner recognition in esteemed circles (Lyons 28). Reason and wonder were not viewed as incompatible opposites, because the theories of enthusiasts were given credence and thoughtfully considered (Gaudio 10-11). This unfettered access had the effect of creating "stylistic riches" in writings on technical matters, as "the rhetoric adopted by science and technology…[was] likewise associated with philosophy and with politics and ethics" (Whitburn et al. 357; Zappen 31-2). Without corporate standards or professional conceptions of how their work should be presented, writers were free to write more imaginatively and borrow from different areas of thought (Atkinson 356-7). Jefferson's appeal to the reader's senses and ideals make his writing beautiful and interesting to read, as opposed to the bland, impersonal writing that we so frequently encounter today. Merrill Whitburn et al. have suggested that in our modern inclination for plain, simple, and direct technical language, we have "so reacted against the excesses of stylistic artistry that a reluctance to use any artistry at all seems to have prevailed ever since" (352).

Opportunities for Further Research

Looking forward, there are many opportunities for further study of technical communications of the past, both in the Age of Enlightenment and in other eras. Bernard Cohen has suggested that much of the writing of the other Founding Fathers is pertinent for study, because they lived in an era before science was practiced as a profession, and the widespread fascination with scientific experiment encouraged intellectuals to dabble in scientific and technical matters as hobbies. This atmosphere may be likened to modern blogging and crowdsourcing, and there is an opportunity for further study of the comparison between the two. Moreover, the political writings upon which our country was founded were influenced by their technical interests: "The framers of the Constitution were primarily concerned with practical rather than philosophical issues…Madison's minutes of the Constitutional Convention[, for example]…display quite a number of rhetorical references to the sciences, just as we should suspect to be the case in an age of reason" (Cohen 257-8). In *Science and the Founding Fathers*, Cohen explores the scientific writing of John Adams and James Madison at length, in addition to Franklin and Jefferson. Today's blurred boundaries between scientific, technical, and professional writing also extended to political and philosophical writing in the Enlightenment. Scholars of this era were exposed to a wider range of subjects and were under less pressure to specialize, which seems to have contributed to a greater acceptance of emotive language and philosophical tone in technical communication. This difference in style is another potential area for further study, and has been supported by scholars such as Katz, Atkinson, Denise Tillery, and Jay Conger.

Other authors of interest in the Age of Enlightenment include Charles Thomson, secretary to the Continental Congress, who wrote a paper on the design of a pump that

automatically began to remove water from leaking ships (Lyons 9, 122, 137). John Neale, a clockmaker in the 1700s, published a book, entitled *Directions for Gentlemen, Who Have Electrical Machines, How to Proceed in Making their Experiments*, which primarily described the method of giving popular electrical shock treatments (thought to have medical benefits) for the use by the general public (Lyons 74-5). Scientific and technical journals of this age are other important sources of historical writing, including the *General Magazine of Arts and Sciences* (a favored reference of the astronomer and mathematician David Rittenhouse), the *Philosophical Transactions of the Royal Society of London,* and the *Transactions of the American Philosophical Society,* which was founded by Franklin himself (Lyons 28, 145, 152).

The influences and attitudes of the Enlightenment offer a particularly useful perspective for our current era, but there are many resources both before and after the Enlightenment of use for historical study. A study of the differences in style and structure between Newton's *Principia* and *Opticks* would provide insight into successful techniques for adapting technical works to their intended audience (D. Locke 8; Cohen 42-3). Tebeaux has promoted the value of studying works from the English Renaissance, roughly spanning from the late fifteenth century to the mid-seventeenth century, to explore the original conceptions of plain language and to access works more concerned with practical applications of technical knowledge, before empirical study gained prominence ("Technical Writing" 225; "Pillaging" 171; "Expanding" 9). Tebeaux has also identified rare technical writings by women from the 1600s that may be of interest to researchers concerned with the role of feminist theory in technical communication ("Voices" 126). Closer to our own era, John Hagge has published a study of engineering textbooks from nineteenth and early twentieth centuries and their influence on the culture and status of the engineering profession ("Early Engineering" 470). Jeff Todd has also noted an interest in

studying the writing of confederate general and civil engineer Pierre Beauregard, automotive and aviation enthusiast Victor W. Page, and President Herbert Hoover (who was a practicing engineer prior to entering politics), among others (72). Gene McGuire observed that "we sometimes view the past as a musty, old closet, a storage place for everything that is used and worn out," yet it is clear from the aforementioned resources that technical communication which has weathered the passing of time can provide useful insights to communicators in contemporary times (149).

Perhaps the most interesting insight from the study of Franklin's and Jefferson's technical writing is the simplicity with which effective communications may be delivered. As the excerpts of their writing presented in this study, and the other historical works mentioned above, demonstrate, sophisticated technology is not necessary to the successful delivery of technical information. Rather, a command of language and understanding of rhetorical principles, in addition to an appreciation of the audience's point of view, can lead to the development of technical communications that remain engaging long after their intended audience is no longer present.

APPENDIX: COPYRIGHT PERMISSION LETTER

Massachusetts
Historical Society
Founded 1791

1 June 2014

Kristin M. Fecko
[redacted]

Dear Ms. Fecko,

This letter is in response to your request to use an image of material owned by the Massachusetts Historical Society.

On behalf of the Massachusetts Historical Society, I grant you non-exclusive, one-time rights to reproduce the image cited below in your dissertation, "Finding a Broader View of Technical Communications in the Past: The Technical Writing of Benjamin Franklin and Thomas Jefferson and its Relevance for the Modern Era," to be completed in partial fulfillment of a degree at the University of Central Florida with conferral expected in July 2014. This permission includes publication of the dissertation for the ProQuest database. If you choose to publish your dissertation in the future it will be necessary to apply for new permission.

The full bibliographic citation for the image appears below. Please use the credit line "Courtesy of the Massachusetts Historical Society."

The MHS waives licensing fees for use of image materials in dissertations. If you have any questions about this order, please contact me at acook@masshist.org or 617-646–0561.

Sincerely,
Anna J. Clutterbuck-Cook
Anna J. Clutterbuck-Cook
Reference Librarian

Citation:

1783 Catalog of Books by Thomas Jefferson, [circa 1775-1812]. Page 10. Original manuscript from the Coolidge Collection of Thomas Jefferson Manuscripts. Massachusetts Historical Society.

1154 Boylston Street | Boston, Massachusetts 02215-3695 | Telephone (617) 536-1608 | Fax (617) 859-0074
www.masshist.org

REFERENCES

Arnold, Vanessa Dean. "Benjamin Franklin on Writing Well." *Personnel Journal* 65.8 (1986): 16-24. Print.

Atkinson, Dwight. "The "Philosophical Transactions of the Royal Society of London," 1675–1975: A Sociohistorical Discourse Analysis." *Language in Society* 25.3 (1996): 333-71. *JSTOR.* Web. 14 October 2013.

Beason, Larry. "Strategies for Establishing an Effective Persona: An Analysis of Appeals to Ethos in Business Speeches." *Journal of Business Communication* 28.4 (1991): 326-46. *SAGE.* Web. 19 Sept 2013.

Bekins, Linn K., and Sean D. Williams. "Positioning Technical Communication for the Creative Economy." *Technical Communication* 53.3 (2006): 287-95. *ingentaconnect.* Web. 11 September 2013.

---. "Benjamin Franklin: Statesman Scientist." *Endeavour* 14.1 (1990): 3-4. Print.

Berman, Eleanor Davidson, and E. C. McClintock, Jr. "Thomas Jefferson and Rhetoric." *The Quarterly Journal of Speech* 33.1 (1947): 1-8. Print.

Bitzer, Lloyd F. "The Rhetorical Situation." *Philosophy & Rhetoric* 25.1 (1992): 1-14. *JSTOR.* Web. 13 October 2013.

Brockmann, R. John. "Bibliography of Articles on the History of Technical Communication." *Journal of Technical Writing and Communication* 13.2 (1983): 155-65. Print.

---. "Does Clio have a Place in Technical Writing? Considering Patents in a History of Technical Communication." *Journal of Technical Writing and Communication* 18.4 (1988): 297-304. Print.

Brogan, John A. "Lessons from Benjamin Franklin, America's First Great Technical Writer." *IEEE Transactions on Engineering Writing and Speech* 8.1 (1965): 3-7. *IEEE Xplore.* Web. 8 Oct 2013.

Burstein, Andrew. "Jefferson and the Familiar Letter." *Journal of the Early Republic* 14.2 (1994): 195-220. Print.

Bushneil, Jack. "A Contrary View of the Technical Writing Classroom: Notes Toward Future Discussion." *Technical Communication Quarterly* 8.2 (1999): 175-88. *Taylor & Francis Online.* Web. 8 January 2014.

Campbell, James. *Recovering Benjamin Franklin*. Chicago: Open Court, 1999. Print.

Chaplin, Joyce E. *The First Scientific American: Benjamin Franklin and the Pursuit of Genius.* New York: Basic Books, 2006. Print.

Charney, Davida. "Empiricism is Not a Four-Letter Word." *College Composition and Communication* 47.4 (1996): 567-93. *JSTOR.* Web. 8 January 2014.

Cillerai, Chiara. "The Eloquence of Nature in *Notes on the State of Virginia*." *Early American Literature* 41.1 (2006): 59-78. Print.

Clark, Gregory. "Ethics in Technical Communication: A Rhetorical Perspective." *IEEE Transactions on Professional Communication* PC 30.3 (1987): 190-95. *IEEE Xplore.* Web. 6 August 2013.

Cohen, I. Bernard. *Science and the Founding Fathers*. New York: W.W. Norton & Company, 1995. Print.

Coney, Mary B. "Technical Readers and their Rhetorical Roles." *IEEE Transactions on Professional Communication* 35.2 (1992): 58-63. *IEEE Xplore.* Web. 8 January 2014.

Conger, Jay A. "The Necessary Art of Persuasion." *Harvard Business Review* 76 (1998): 84-97. *EBSCO Host.* Web. 5 September 2013.

Conklin, James. "From the Structure of Text to the Dynamic of Teams: The Changing Nature of Technical Communication Practice." *Technical Communication* 54.2 (2007): 210-31. *ingentaconnect.* Web. 15 October 2013.

Connor, Jennifer J. "History and the Study of Technical Communication in Canada and the United States." *IEEE Transactions on Professional Communication* 34.1 (1991): 3-6. *IEEE Xplore.* Web. 6 August 2013.

Connors, Robert J. "The Rise of Technical Writing Instruction in America." *Central Works in Technical Communication.* Eds. Johndan Johnson-Eilola and Stuart A. Selber. New York: Oxford University Press, 2004. 3-19. Print.

Cook, Kelli Cargile. "Layered Literacies: A Theoretical Frame for Technical Communication Pedagogy." *Technical Communication Quarterly* 11.1 (2002): 5-29. *Taylor & Francis Online.* Web. 19 September 2013.

Crowley, Sharon, and Debra Hawhee. *Ancient Rhetorics for Contemporary Students*. 4th ed. New York: Pearson Longman, 2009. Print.

Davis, Marjorie T. "Shaping the Future of our Profession." *Technical Communication* 48.2 (2001): 139-44. *ingentaconnect.* Web. 1 August 2013.

Davy, George Alan. "Argumentation and Unified Structure in *Notes on the State of Virginia*." *Eighteenth-Century Studies* 26.4 (1993): 581-93. Print.

Devons, Samuel. "Benjamin Franklin as Experimental Philosopher." *American Journal of Physics* 45.12 (1977): 1148-53. *AIP Scitation.* Web. 4 Oct 2013.

Dobrin, David N. "What's Technical about Technical Writing?" *Central Works in Technical Communication.* Eds. Johndan Johnson-Eilola and Stuart A. Selber. New York: Oxford University Press, 2004. 107-23. Print.

Dombrowski, Paul M. *Ethics in Technical Communication*. Boston: Allyn and Bacon, 2000. Print.

Dombrowski, Paul M. "The Evolving Face of Ethics in Technical and Professional Communication: Challenger to Columbia." *IEEE Transactions on Professional Communication* 50.4 (2007): 306-19. *IEEE Xplore.* Web. 15 October 2013.

---. "Language and Empiricism." *Journal of Technical Writing and Communication* 32.1 (2002): 3-21. Print.

---, ed. "Rhetoric of Science." *Humanistic Aspects of Technical Communication.* New York: Baywood Publishing Company, Inc., 1994. 15-32. Baywood's Technical Communication Series. Print.

Fichtelberg, Joseph. "The Complex Image: Text and Reader in the *Autobiography* of Benjamin Franklin." *Early American Literature* 23 (1988): 202-16. *JSTOR.* Web. 4 Oct 2013.

Franklin, Benjamin. "Causes of Earthquakes." *The Works of Benjamin Franklin, Vol. II, Letters and Miscellaneous Writings, 1735-1753.* Ed. John Bigelow. Online Library of Liberty, 1904. Web. 24 Mar 2014. <http://oll.libertyfund.org/titles/franklin-the-works-of-benjamin-franklin-vol-ii-letters-and-misc-writings-1735-1753#Franklin_1438-02_289>.

---. *The Complete Works of Benjamin Franklin, 1767-1772*. Ed. John Bigelow. Vol. IV. New York: G.P. Putnam's Sons, 1888. Print.

---. *The Complete Works of Benjamin Franklin, 1776-1779*. Ed. John Bigelow. Vol IV. New York: G.P. Putnam's Sons, 1888. Print.

---. "Description of a New Stove for Burning of Pitcoal, and Consuming all its Smoke, by Dr. Franklin." *Transactions of the American Philosophical Society* 2 (1786): 57-74. *JSTOR.* Web. 29 Mar 2014.

---. *The Ingenious Dr. Franklin: Selected Scientific Letters of Benjamin Franklin*. Ed. Nathan G. Goodman. Philadelphia: University of Pennsylvania Press, 1931. Print.

---. "A Letter from Dr. Benjamin Franklin, to Mr. Alphonsus le Roy, member of several academies, at Paris. Containing sundry Maritime Observations." *NOAA Ocean Explorer: Observations on the Gulf Stream.* Aug 1785. Web. National Oceanic and Atmospheric Administration. 24 Mar 2014. <http://oceanexplorer.noaa.gov/history/readings/gulf/gulf.html>.

---. "Opinions and Conjectures Concerning the Properties and Effects of the Electrical Matter, arising from Experiments and Observations made in Philadelphia, 1749." *Benjamin Franklin letter to Peter Collinson - July 29, 1750.* Web. Revolutionary War and Beyond. 29 Mar 2014. <http://www.revolutionary-war-and-beyond.com/benjamin-franklin-letter-to-peter-collinson-july-29-1750-2.html>.

---. *The Select Works of Benjamin Franklin*. Ed. Epes Sargent. Boston: Phillips, Sampson & Co., 1856. Print.

---. *Writings*. Ed. J. A. Leo Lemay. New York: Literary Classics of the United States, Inc., 1987. Library of America. Print.

Gaudio, Michael. "The Two Enlightenments." *American Art* 23.2 (2009): 10-2. *JSTOR.* Web. 4 October 2013.

Goodman, Nathan G. "The Ingenious Dr. Franklin." *The Ingenious Dr. Franklin: Selected Scientific Letters of Benjamin Franklin.* Philadelphia: University of Pennsylvania Press, 1931. 1-13. Print.

Gresham, Stephen L. "Benjamin Franklin's Contributions to the Development of Technical Communication." *Journal of Technical Writing and Communication* 7.1 (1977): 5-13. Web. 27 September 2013.

Griffith, John. "The Rhetoric of Franklin's *Autobiography*." *Criticism* (1971): 77-94. *JSTOR.* Web. 4 Oct 2013.

Gross, Alan. *The Rhetoric of Science*. 2nd ed. Cambridge: Harvard University Press, 1996. Print.

Hagge, John. "Early Engineering Writing Textbooks and the Anthropological Complexity of Disciplinary Discourse." *Written Communication* 12.4 (1995): 439-91. *SAGE.* Web. 10 September 2013.

---. "Ethics, Words, and the World in Moore's and Miller's Accounts of Scientific and Technical Discourse." *Journal of Business and Technical Communication* 10.4 (1996): 461-75. *SAGE.* Web. 9 January 2014.

Harris, R. Allen. "Rhetoric of Science." *College English* 53.3 (1991): 282-307. *JSTOR.* Web. 17 February 2014.

Hart-Davidson, William. "On Writing, Technical Communication, and Information Technology: The Core Competencies of Technical Communication." *Technical Communication* 48.2 (2001): 145-55. *ingentaconnect.* Web. 15 October 2013.

Headrick, Daniel R. *When Information Came of Age*. New York: Oxford University Press, 2000. Print.

Hellenbrand, Harold. "Roads to Happiness: Rhetorical and Philosophical Design in Jefferson's *Notes on the State of Virginia*." *Early American Literature* 20 (1985): 3-23. Print.

Hodgson, Dennis. "Benjamin Franklin on Population: From Policy to Theory." *Population and Development Review* 17.4 (1991): 639-61. Print.

Holmes, Richard. *The Age of Wonder*. New York: Pantheon Books, 2008. Print.

Holowchak, M. Andrew. "Philosophical Vignettes in Jefferson's *Notes on Virginia*." *Philosophy and Literature* 37.1 (2013): 136-63. *Project MUSE.* Web. 20 October 2013.

Horton, Richard. "The Rhetoric of Research." *BMJ* 310 (1995): 985-87. *NIH.gov.* Web. 13 October 2013.

Howell, Wilbur Samuel. "The *Declaration of Independence* and Eighteenth-Century Logic." *The William and Mary Quarterly* 18.4 (1961): 463-84. Print.

Jefferson, Thomas. "1783 Catalog of Books." *Thomas Jefferson Papers: An Electronic Archive.* 1812. Web. Massachusetts Historical Society. 3 April 2014. <http://www.masshist.org/thomasjeffersonpapers/doc?id=catalog1783_10>.

---. *The Complete Jefferson*. Ed. Saul K. Padover. New York: Tudor Publishing Company, 1943. Print.

---. "Instructions to Meriwether Lewis." *Jefferson's Instructions to Meriwether Lewis.* 20 Jun 1803.Web. Th. Jefferson Monticello. 6 Apr 2014. <http://www.monticello.org/site/jefferson/jeffersons-instructions-to-meriwether-lewis>.

---. "A Memoir on the Discovery of Certain Bones of a Quadruped of the Clawed Kind in the Western Parts of Virginia." *Transactions of the American Philosophical Society* 4 (1799): 246-60. *JSTOR.* Web. 3 April 2014.

---. *Writings*. Ed. Merrill D. Peterson. New York: Literary Classics of the United States, Inc., 1984. Library of America. Print.

Jones, Daniel R. "A Rhetorical Approach for Teaching the Literature of Scientific and Technical Writing." *The Technical Writing Teacher* 12.2 (1985): 115-25. Print.

---. *Technical Writing Style*. Boston: Allyn and Bacon, 1998. Print.

"Joseph Priestley." *Chemical Heritage Foundation.* n.d. Web. Chemical Heritage Foundation. 11 April 2014 <http://www.chemheritage.org/discover/online-resources/chemistry-in-history/themes/early-chemistry-and-gases/priestley.aspx>.

Katz, Steven B. "The Ethic of Expediency: Classical Rhetoric, Technology, and the Holocaust." *Central Works in Technical Communication.* Eds. Johndan Johnson-Eilola and Stuart A. Selber. New York: Oxford University Press, 2004. 195-210. Print.

Kim, Loel, and Christie Tolley. "Fitting Academic Programs to Workplace Marketability: Career Paths of Five Technical Communicators." *Technical Communication* 51.3 (2004): 376-86. *ingentaconnect.* Web. 7 March 2014.

Lane, Neal. "Benjamin Franklin, Civic Scientist." *Physics Today* 56.10 (2003): 41-6. *EBSCO Host.* Web. 20 Aug 2013.

Lanier, Clinton R. "Analysis of the Skills Called for by Technical Communication Employers in Recruitment Postings." *Technical Communication* 56.1 (2009): 51-61. *ingentaconnect.* Web. 7 March 2014.

Lemay, J. A. Leo. "Chronology." *Writings.* New York: Literary Classics of the United States, Inc., 1987. 1471-1498. Library of America. Print.

Lerner, Max. "Ambiguity and Unity in Jefferson's Thought." *Society*. January/February (1997): 45-50. *Springer Link*. Web. 4 October 2013.

Levinson, Martin H. "Benjamin Franklin: A Time-Binder Extraordinaire." *ETC: A Review of General Semantics* 66.3 (2009): 269-77. *EBSCO Host.* Web. 4 Oct 2013.

Lipson, Carol. "A Social View of Technical Writing." *Journal of Business and Technical Communication* 2.1 (1988): 7-20. *SAGE*. Web. 7 March 2014.

Locke, David. *Science as Writing*. New Haven: Yale University Press, 1992. Print.

Locke, Simon. "The Public Understanding of Science — A Rhetorical Invention." *Science, Technology & Human Values* 27.1 (2002): 87-111. *SAGE.* Web. 3 September 2013.

Lucas, Stephen E. "The Rhetorical Ancestry of the *Declaration of Independence*." *Rhetoric & Public Affairs* 1.2 (1998): 143-84. *Project MUSE*. Web. 27 October 2013.

Lyons, Jonathan. *The Society for Useful Knowledge*. New York: Bloomsbury Press, 2013. Print.

Malone, Edward A., and David Wright. "The Role of Historical Study in Technical Communication Curricula." *Programmatic Perspectives* 4.1 (2012): 42-87. *Cptsc.org.* Web. 14 Aug 2013.

Malone, Edward A. "Historical Studies of Technical Communication in the United States and England: A Fifteen-Year Retrospection and Guide to Resources." *IEEE Transactions on Professional Communication* 50.4 (2007): 333-51. *IEEE Xplore.* Web. 1 August 2013.

Martin, Edwin T. *Thomas Jefferson: Scientist*. New York: Henry Schuman, 1952. Print.

Martin, John S. "Rhetoric, Society and Literature in the Age of Jefferson." *Midcontinent American Studies Journal* 9.1 (1968): 77-90. *Journals.ku.edu*. Web. 4 October 2013.

Mazur, Beth. "Revisiting Plain Language." *Technical Communication* 47 (2000): 205-11. Print.

McGuire, Gene. "Models for Technical Communicators — Editor." *Technical Communication* 38 (1991): 149. Print.

Miller, Carolyn R. "A Humanistic Rationale for Technical Writing." *College English* 40.6 (1979): 610-17. *JSTOR.* Web. 15 Aug 2013.

Miller, Walter James. "What Can the Technical Writer of the Past Teach the Technical Writer of Today?" *IRE Transactions on Engineering Writing and Speech* 4.3 (1961): 69-76. *IEEE Xplore.* Web. 28 Oct 2013.

Moeller, Ryan, and Ken McAllister. "Playing with Techne: A Propaedeutic for Technical Communication." *Technical Communication Quarterly* 11.2 (2002): 185-206. *Taylor & Francis Online.* Web. 8 January 2014.

Moore, Patrick. "Cruel Theory? The Struggle for Prestige and its Consequences in Academic Technical Communication." *Journal of Technical Writing and Communication* 38.3 (2008): 207-40. *Baywood Publishing Company, Inc.* Web. 1 August 2013.

Mulder, Arnold. "Benjamin Franklin: Teacher of Composition." *College English* 3.5 (1942): 480-6. *JSTOR.* Web. 4 Oct 2013.

Nichols, Michael. "Thomas Jefferson's *Notes*." *Technical Communication* 38 (1991): 149-50. Print.

Ornatowski, Cezar M., and Linn K. Bekins. "What's Civic about Technical Communication? Technical Communication and the Rhetoric of Community." *Technical Communication Quarterly* 13.3 (2004): 251-69. *Taylor & Francis Online.* Web. 19 September 2013.

Padover, Saul K. "Introduction." *The Complete Jefferson.* New York: Tudor Publishing Company, 1943. ix-x. Print.

Perelman, Leslie C. "The Two Rhetorics: Design and Interpretation in Engineering and Humanistic Discourse." *Language and Learning across the Disciplines* 3.2 (1999): 64-82. *Iugaza.edu.* Web. 2 December 2013.

Pringle, Kathy, and Sean Williams. "The Future is the Past: Has Technical Communication Arrived as a Profession?" *Technical Communication* 52.3 (2005): 361-70. *ingentaconnect.* Web. 11 September 2013.

Reeves, Carol. "'I Knew there was Something Wrong with that Paper': Scientific Rhetorical Styles and Scientific Misunderstandings." *Technical Communication Quarterly* 14.3 (2005): 267-75. *Taylor & Francis Online.* Web. 13 October 2013.

Rivers, William E. "Studies in the History of Business and Technical Writing A Bibliographical Essay." *Journal of Business and Technical Communication* 8.1 (1994): 6-57. *SAGE.* Web. 10 Sept 2013.

Rosner, Mary. "Style and Audience in Technical Writing: Advice from the Early Texts." *The Technical Writing Teacher* 11.1 (1983): 38-45. Print.

Rude, Carolyn D. "Mapping the Research Questions in Technical Communication." *Journal of Business and Technical Communication* 23.2 (2009): 174-215. *SAGE.* Web. 6 Aug 2013.

Rutter, Russell. "History, Rhetoric, and Humanism: Towards a More Comprehensive Definition of Technical Communication." *Central Works in Technical Communication.* Eds. Johndan Johnson-Eilola and Stuart A. Selber. New York: Oxford University Press, 2004. 3-19. Print.

Schiess, Wayne. "Ethical Legal Writing." *The Review of Litigation* 21.3 (2002): 527-50. Print.

---. "What Plain English Really Is." *The Scribes Journal of Legal Writing* (2003-2004): 43-75. Print.

Schnakenberg, Karen Rossi. "A Plea to make History More a Part of Current Curriculums". *The Ecology, the Environment, and the Evolution of Technical Communication: Proceedings of the Annual Meeting of the Council for Programs in Technical and Scientific*

Communication. 15-17 October 1998, Council for Programs in Technical and Scientific Communication, 1999. 65-6. *Cptsc.org*. Web. 12 September 2013.

Smith, Catherine F. "Thomas Jefferson's Computer." *Computers and Composition* 13.1 (1996): 5-21. *Elsevier*. Web. 4 October 2013.

Smith, Elizabeth Overman. "Intertextual Connections to 'A Humanistic Rationale for Technical Writing'." *Journal of Business and Technical Communication* 11.2 (1997): 192-222. *SAGE*. Web. 11 September 2013.

Spigelman, Candace, and Laurie Grobman. "Why we Chose Rhetoric: Necessity, Ethics, and the (Re)Making of a Professional Writing Program." *Journal of Business and Technical Communication* 20.1 (2006): 48-64. *SAGE*. Web. 11 September 2013.

Stearns, Peter N. "Why Study History?" *American Historical Association.* 1998.Web. American Historical Association. 11 September 2013. <http://historians.org/about-aha-and-membership/aha-history-and-archives/archives/why-study-history-%281998%29>.

Sullivan, Patricia A., and James E. Porter. "Remapping Curricular Geography Professional Writing in/and English." *Journal of Business and Technical Communication* 7.4 (1993): 389-422. *SAGE*. Web. 8 January 2014.

Tebeaux, Elizabeth, and M. Jimmie Killingsworth. "Expanding and Redirecting Historical Research in Technical Writing: In Search of our Past." *Technical Communication Quarterly* 1.2 (1992): 5-32. Print.

Tebeaux, Elizabeth. "Franklin's *Autobiography* — Important Lessons in Tone, Syntax, and Persona." *Journal of Technical Writing and Communication* 11.4 (1981): 314-19. Print.

---. "Pillaging the Tombs of Noncanonical Texts Technical Writing and the Evolution of English Style." *Journal of Business and Technical Communication* 18.2 (2004): 165-97. *SAGE.* Web. 1 August 2013.

---. "Technical Writing in Seventeenth-Century England: The Flowering of a Tradition." *Journal of Technical Writing and Communication* 29.3 (1999): 209-54. *Baywood Publishing Company, Inc.* Web. 1 August 2013.

---. "The Voices of English Women Technical Writers, 1641–1700: Imprints in the Evolution of Modern English Prose Style." *Technical Communication Quarterly* 7.2 (1998): 125-52. *Taylor & Francis Online.* Web. 19 January 2014.

---. "What Makes Bad Technical Writing Bad? A Historical Analysis." *IEEE Transactions on Professional Communication* PC-23.2 (1980): 71-6. *IEEE Xplore.* Web. 1 August 2013.

Thomson, Keith. *Jefferson's Shadow: The Story of His Science.* New Haven: Yale University Press, 2012. Print.

Tillery, Denise. "The Plain Style in the Seventeenth Century: Gender and the History of Scientific Discourse." *Journal of Technical Writing and Communication* 35.3 (2005): 273-89. *Baywood Publishing Company, Inc.* Web. 8 January 2014.

Todd, Jeff. "Teaching the History of Technical Communication: A Lesson with Franklin and Hoover." *Journal of Technical Writing and Communication* 33.1 (2003): 65-81. *Baywood Publishing Company, Inc.* Web. 6 Aug 2013.

Torr-Brown, Sheryl. “Crowdsourced science and genetic insights for personalizing medicine: beginning to deliver the goods.” *Personalized Medicine* 9.6 (2012): 569-72. *Future Medicine*. Web. 18 June 2014.

Walzer, Arthur E., and Alan Gross. "Positivists, Postmodernists, Aristotelians, and the Challenger Disaster." *College English* 56.4 (1994): 420-33. *JSTOR.* Web. 6 March 2014.

Whitburn, Merrill D., et al. "The Plain Style in Scientific and Technical Writing." *Journal of Technical Writing and Communication* 8.4 (1978): 349-58. Print.

Whiteman, Lily. "Management: Raising the Bar on Legal Writing." *Law.com.* 6 June 2000. ALM. Print.

Williams, Joseph M., and Gregory G. Colomb. *Style: Lessons in Clarity and Grace*. 10th ed. Boston: Longman, 2010. Print.

Winsor, Dorothy A. "Rhetorical Practices in Technical Work." *Journal of Business and Technical Communication* 12.3 (1998): 343-70. *SAGE.* Web. 4 September 2013.

Younger, Irving. "Skimming the Fat Off Your Writing." *Michigan Bar Journal* 82.5 (2003): 32. Print.

Zappen, James P. "Rhetoric and Technical Communication: An Argument for Historical and Political Pluralism." *Journal of Business and Technical Communication* 1.2 (1987): 29-44. *SAGE.* Web. 23 October 2013.