

THE RHETORIC OF NATURAL HISTORY AND PHILIP HENRY GOSSE

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## ABSTRACT

The objective of this thesis is to re-contextualize the genre of natural history writing along with rhetorical theory to delineate an argument for examining the rhetoric of natural history as a method for exploring the spatial, symbolic, and ecological relationships between collected specimens and their cultural, historical, and political moments in the greater canon of knowledge of the natural world. I am using a history of science approach to conduct interdisciplinary research of Eighteenth- and Nineteenth-century natural history as an early form of science writing in order to better understand how science is made and the conditions under which facts are constructed. By examining the rhetoric of the artificial systems created by naturalists to name and categorize nature, I will include a brief look at the ontology of racial identity in the North American South as a consequence of the application of these artificial systems to social theory.

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## INTRODUCTION

### Why Study the History of Science?

Bruno Latour's *Science in Action* argues for the exigency of studying "the making of science." Latour contends that there has been very little study of the development of science, which has led to an inadequacy of fact-checking and a disconnect between contemporary culture and the natural world. Latour writes:

They [scientists] shy away from the disorderly mixture revealed by science in action and prefer the orderly pattern of scientific method and rationality. Defending science and reason against pseudoscience, against fraud, against irrationality keeps most of these people too busy to study it. As to the millions, or billions, of outsiders, they know about science and technology through popularization only (15).

This quote from Latour is particularly kairotic in the post-truth society in which we live. In the age of "fake news," debates over vaccinations and climate change, and arguments over policies to manage a global pandemic, topics that were once deferred to the experts have become highly-politicized and often arguments without logic and sound data.

Authors Alan G. Gross, Joseph E. Harmon, Michael S. Reidy recognized the "obvious" importance of the scientific article as a communication medium for being essential to presenting and debating discovery claims. Although they examined scientific articles published in journals from the Seventeenth-century to the present, their process for analyses has established the framework for examining the rhetoric of science. Their important work has led to the recognition

of trends in style that I will be using to trace the development of natural history writing through the Enlightenment epoch.

The communication of scientific data and the mediums of communication used are critical to the longevity of the practice. Historian of science Lorraine Daston argues for the importance of archives and the preservation of scientific data by offering perspective for the developmental time needed for establishing scientific theories. Daston explains that science has existed longer than any one civilization. It is as old as mankind itself, but was called natural history until scientific inquiry split into the hard sciences. In other words, the development of some scientific facts has taken centuries. Due to the collaborative, participatory nature of the making of science, efficient record preservation and data communication are vital conditions to framing and explaining empirical discoveries. The types of sciences dependent on long-lived collections of information, Daston calls “sciences of the archives”— archeology, climatology, astronomy, geology, etc. Daston uses the example of NASA’s canon of eclipse data, which utilizes records written on ancient cuneiform tablets (Daston YouTube.com). In this example, the data kept has transcended language, time, cultures, and continents.

The rhetoric of science is not only important to the development of the practice of science, but also to social theory. A rhetorical inquiry highlights the logical process of how science is made, and how scientific arguments become accepted, or rejected, as facts. Humans have proven time and again unable to resist the urge to apply laws of nature to society. Sometimes, it proves to be successful, and other times it has ended in disaster. Historian of science Paul Lawrence Faber addresses social consequences of applying the laws of nature to society. In *The Temptation of Evolutionary Ethics* Faber writes:

Although biology has contributed to our understanding of the functioning of the

human body, to recognizing more fully our ecological place in the biosphere, and more recently, to preventing or curing many diseases, it has been singularly unsuccessful in solving social problems or providing moral guidance (Farber *Temptations* 3).

Latour claims that “historians of science pay little attention to literary studies or to rhetoric” (16), however the rhetoric of science is a critical component for understanding the communication process through which scientific argument becomes accepted as fact. This is the gap in the conversation that I hope to address in my research. In order to examine the intersectionality of the history of science and the history of rhetoric, I will follow a linear trajectory to trace early natural history writing beginning in ancient Greece and Rome, which established a tradition of presenting information on the natural world in an encyclopedic format. I will then examine the rhetorical functions of the Linnaean System of binomial nomenclature and apply each of these traditions to the writings of Philip Henry Gosse, which will serve as my artifact.

Chapter One applies a multidisciplinary perspective to analyze the often-overlooked ancient literary genre of paradoxography by utilizing concepts from information systems and a derivative of rhetorical feminist theory called Invitational Rhetoric. Through an application of a historiographical methodology, I will argue for the inclusion of the paradoxography genre through its use of invitational rhetoric into the history of rhetorical theory as an early form of the rhetoric of science, pertinent to the development of the natural history genre. The concepts I am proposing will provide rhetoricians with a non-traditional technique for establishing ethos through the development of synthetic ethos which can be applied to various types of collections or systems. Nature writing and natural history writing about the New World beginning as early



as the Fifteen Hundreds contain elements of wonder— exposure to new climates, indigenous peoples, threatening disease, and unfamiliar weather all created anxiety of the unknown and are topics naturalists struggled to reconcile and explain with their modern understanding of scientific theories.

Chapter Two examines the rhetorical perspective of the development of natural history as a practice that leads to the formulation of its own language through systematic nomenclature. Michel Foucault’s writings on natural history are used to explore how knowledge is created and transferred through discourse- in this case, the discourse method is binomial nomenclature as proposed by Carl Linnaeus. This chapter introduces the idea of the power given to physical qualities and anomalies in the natural world through the material practices of identifying and classifying.

In Chapter Three, I will be utilizing *Letters from Alabama* by Philip Henry Gosse as the rhetorical artifact for analyzing natural history as an early form of science writing. Gosse should be of interest to rhetoricians because his writings contain insight into the social consequences of Enlightenment thought, while his sketches of botany and insects demonstrate how objects of the natural world become “actants”— all part of the shift in scientific paradigms of the Eighteenth- and Nineteenth-centuries. In order to argue the importance for investigating the power given to physical qualities and anomalies in the natural world through the material practices of identifying and classifying, I will use New Materialism, as Jane Bennett describes the theory in *Vibrant Matter: A Political Ecology of Things*, and as used by Monique Allewaert to assign agency to the natural world, and assess its place in the genre of the rhetoric of science according to Alan Gross et al., and properties discussed in *Communicating Science*.

## Introduction to Natural History

Before there was science as we know it, there was natural history. This study will trace events significant to natural history as a learned practice and a knowledge system with epistemological aspirations of establishing deeper understandings of science communication practices from approximately 1735-1930. I will identify rhetorical characteristics of science writing and specimen description that are unique to the Eighteenth- and Nineteenth-century paradigmatic shift reflecting how science moved away from religiously influenced schools of thought and paved the way for secular evolutionary and humanistic theories (although this time is characterized by both natural theology and natural philosophy). I will also demonstrate how through Enlightenment rhetoric new standards for argument were established which pushed natural history as a practice towards the split of science into hard sub-disciplines.

In my research, I use the term “naturalists” in the context used by Daston, who defines the term naturalists as:

...roughly the sense of Aristotle’s ‘hoi physikoi,’ to refer to those who engage in the systematic study of nature, including natural history and natural philosophy, as well as disciplines like astronomy, optics, and especially medicine, which has been autonomous since antiquity...to avoid both cumbersome listings of different groups and the anachronism of the term ‘scientist,’ with its misleading associations of professionalization (373).

Through the investigation of the rhetorical elements of cataloging, taxonomy, and a rhetorical analysis of *Letters from Alabama* by Philip Henry Gosse, I will argue that the learned practices

and artificial systems specific to the natural history discourse community fueled the transition from religious to secular systematic and analytical theories, and the tension created as the natural world resisted man's attempt to possess it. This paradigm shift away from mechanical thinking into recognizing organic relationships between organisms, habitats, and humans, created a rhetorical opportunity for describing how the development of life was commonly understood and for providing lasting theoretical framework and context for explaining religion and the natural world. Natural history practices provided a scientific frame of reference that naturalists applied to the ways in which they processed and made sense of all components of the natural world—including humans. This theoretical framework has continuously been built upon, manipulated, and developed into modern scientific theories. For example, before the paradigm shift taking place over the course of the Enlightenment, natural disasters were attributed to God directing punishment towards an individual or specific group of people. Agency has slowly been transferred to nature, as natural disasters became seen as results of weather and geology, and no longer attributed to God's wrath. In our current society, the paradigm is beginning to shift again, where agency, and blame, for natural disasters is being placed on humans in the Anthropocene and contemporary societies' misuse of the planet.

The widespread practice and cultural popularity of natural history as a multi-disciplinary scientific practice spanned approximately two hundred years, precipitated by the French Enlightenment and ending in the early twentieth century with the development of molecular biology. Enlightenment rhetoric was characterized by changes in argument, establishing a higher standard for evidence, and rejecting syllogism and other forms of deductive reasoning. Zoologist Marston Bates defines natural history as, “the study of life at the level of the individual—of what plants and animals do, how they react to each other and their environment, how they are

organized into larger groupings like populations and communities” (Bates 7). It is seen by historians of science as both a single subject, and as part of a larger, wide-scale endeavor of learned societies across the world to fuel progress and local economies through scientific advancements (Dietz 27). Writings from this period of time should be of interest to rhetoricians of science because they represent a remarkable paradigm shift, and, in turn, a shift in writing and communication—a transition from qualitative and religiously influenced romantic rhetoric to quantitative, highly analytical data-filled rhetoric. The study of the rhetorical properties found in science writing is a fairly new field of inquiry. Very little research on the rhetorical aspects of natural history as a practice and as an early form of science writing exists.

Farber describes the emergence of the discipline as a scientific practice as precipitating from two seminal Eighteenth-century publications: Carl Linnaeus’s 1735 *Systema naturae*, which proposed a classification system and naming process for all organisms by introducing binomial nomenclature, and Georges Louis Leclerc, comte de Buffon’s 1781 *Histoire naturelle*, which served as a prototype encyclopedia for the organization and cataloging of biology (Faber 6, 21.) These publications established the methodology for practicing natural history. (I will argue in my thesis that the encyclopedic tradition was established much earlier through the paradoxography genre.) The Linnaean system is significant because it provided a feasible methodology for assigning every species of flora and fauna its own place in a system, aligning the practice of natural history with more mathematically oriented disciplines and created a more distinct separation from its prior association with superstition and metaphysics. These material practices developed into an international participatory cooperative of actors, working together to collect, identify, name, and document local plants, animals, and geological specimens (Dietz 27.) In this context, the participatory cooperative of actors can best be described by Henry Jenkins as,

“[referring] to properties of the culture where groups collectively and individually make decisions that have an impact on their shared experiences” (12). The practice of natural history created a global culture of collaboration through the circulation of information gathered by naturalists. The circulation of natural specimens is also important to consider, especially in a time when the effects of transplanting biota into nonnative environments were unknown. The interest in naturalization was often driven by nationalism and capitalistic endeavors of colonialism—attempts to monetize natural resources through assimilating exotic flora and fauna into local habitats in order to enhance profitability of local geography. Historian Joyce Chaplin describes the era in North America as dominated by secular visions of humanity, largely concerned with improving the material basis of society (3). This created an atmosphere of ambivalence, as the desire to embrace science in order to enhance economic development and establish a metropole of learning conflicted with resistance to social improvements regarding changes to the institution of slavery as the foundation to the wildly profitable plantation economy. Chaplin argues:

Whites embraced for example, developments offered by science and social-scientific views of humanity in their quest to make a stronger economy.

They resembled many other groups in the modern era who used science not simply to enlighten individuals and to improve society but also to apologize for forms of exploitation and social control— especially when these justifications were done in racist terms (15).

This conflict of ideas can be seen in writings of naturalists in the North American South in their descriptions of Afro Americans and Native Americans. The political and economic characteristics of the South as it continued in the direction of pursuing commerce while societies

in other parts of the world began to turn towards manufacturing, as well as the abundance of undiscovered species in the region, created a distinctive historical context for natural history writing. Colonial literary scholar Christopher Iannini writes, “Relying on sophisticated assumptions, lost to posterity, about the reading and writing of natural history books, the curious and learned developed a specific understanding of modern commerce and colonialism, assessing the deep and necessary connections between the histories of slavery, commercial progress, and intellectual enlightenment” (15).

Understanding the rhetorical practices of natural history requires familiarity with two critical tools of material practice— data collection, organization, and presentation which will be discussed in Chapter One; and the practice of taxonomy which will be discussed in Chapter Two. Through the learned praxis of binomial nomenclature, laymen (often including members of subaltern communities) and scholars alike could communicate in the field and across the world to assemble a larger database of commodities beyond their own limited assortment of natural resources. The circulation of information was mainly epistolary, along with the exchange of books and often physical specimens. The practice of natural history proved to be a powerful engine for global correspondence throughout the Eighteenth- and Nineteenth- centuries. This widespread mobilization facilitated shifts in scientific paradigms as science moved away from religiously influenced schools of thought, paving the way for secular evolutionary and humanistic theories, and the eventual split of science into hard sub-disciplines. This mobilization had other social and economic consequences, many which contributed to North America’s transition into an independent nation. In America, natural history was a highly charged subject with deep rooted political and financial implications in the Old World. The study of botany was of specific importance because specimens could be easily collected, preserved, shipped, and

grown not just in new locations in the New World, but also in the universities and botanical garden centers of Europe. Exotic botanical specimens became an obsession in Europe, especially England, and their possession quickly became symbols of social status. In the Eighteenth-century, tradesmen and importers such as Peter Collinson, a middle-class Quaker cloth dealer, found that importing plant specimens from the new world opened doors to elite social circles, providing him with business opportunities not available to him before. The British elite, not only members of the scientific community, came to rely on North American colonists to collect and ship the specimens. Thomas Jefferson, a member of this international gardening community and an avid gardener himself, was aware of the implications of the economic production potential of the colonies, and also of how much the Americas relied on their European sponsors.

In North America, the Lower South and American tropics present an intriguing set of circumstances for the practice of natural history due to geography and environment; diversity in climate, flora, and fauna; political climate; politics of plantation culture; and the participation of subaltern groups such as Afro-Americans, colonists, and Native Americans. New World degeneracy (or the vital principle) and humoral theories, the rise of capitalism, anxiety over creolization, and the unknown effects of transplantation of living things into new environments are all factors found in science communication of this era. Natural history work conducted in the American Southeast during this time is distinctive from scientific work conducted in the European academies owing to an abundance in novel native species, the tropical climate, and socio-economic differences such as plantation society. “Natural history developed as a colonial genre through its efforts to describe, disseminate, and contemplate those facts” (Iannini 6). I believe the writings of Philip Henry Gosse are pertinent to the intersectionality of the history of rhetoric and the history of science. Gosse embodies the changing paradigm in science writing—

natural theology and natural philosophy. His work is not only belletristic travel writing, but also a work of science writing.



## CHAPTER ONE

### THE SYNTHETIC ETHOS OF CLASSICAL MISCELLANY

The purpose of this chapter is to function as the beginning of a conversation on the ancient genre of paradoxography and its past and present rhetorical applications. In this chapter, I will propose the idea that paradoxography was probably composed with an audience in mind, and like our modern-day encyclopedias, was composed with didactic intention. These intentions are what we would recognize today as a rhetorical exercise and memorization technique, and also a reference source for scientific inquiry that became a precursor to natural history literature and the rhetoric of science. I will apply two modern terms to assess the genre, synthetic ethos and invitational rhetoric, and argue for an inclusion of paradoxography into the historiography of rhetoric.

Paradoxography, as a form of describing the natural world, is an ancient literary genre that has been overlooked by Classicists and Rhetoricians in the past. Paradoxography can be roughly defined as list making of mirabilia (marvels), miracles, novelties and assemblages of information about the natural world. Aristotle's *History of Animals* with brief descriptions and characteristics of animals; Pliny's *Natural History*, an encyclopedia housing snapshots of scientific knowledge from the Roman Empire; *The Geography of Strabo*, a massive compilation of geographical data and cultural history; and the systematic presentation of Greek mythology in Hesiod's *The Shield* are all examples of paradoxography. The format of the genre served as a repository of data, and is an early prototype of the encyclopedia, and what Daston refers to as the Archives— a collection

of early scientific data used to establish framework and context for empirical discoveries to follow. It has often been reduced to a resource for gleaning a glimpse of ancient thought on various subjects such as history, science, myth, and culture. William Hansen states that there is rarely intent behind the compilation of paradoxography. His argument in 1996 is representative of the position of classicists on the genre. Hansen writes, “Only rarely do the compilers show an interest in the analysis or interpretation of their material, which they present, not to illustrate general principles or to facilitate the discovery of new knowledge, but solely for the pleasure of its immediate interest” (8). Scott Fitzgerald Johnson confirmed this belief in 2006. Johnson writes:

The literary history of Hellenistic, Roman, and late antique literary collections is rich and important, principally because it reveals a substratum of ancient literature that is rarely talked about on its own. Instead, these texts are usually mined by scholars for the otherwise lost information they contain about the ancient world (195).

Examining the rhetorical properties of the genre provides an approach for recognizing and defining a broader purpose and discovering interrelations between the texts, a before connection to the genre of natural history literature, as well as a suggestion that paradoxography is one precursor to the rhetoric of science.

## Methodology

The methodology that I will be using is a three-step historiographical approach proposed in 2010 by David M. Timmerman and Edward Schiappa in *Classical Greek Rhetorical Theory and the Discipline of Discourse*. After defining paradoxography, I will structure my argument in order to align with their proposed methodology. I will first discuss how the genre of paradoxography contributes to the concepts of rhetorical theory. Second, I will explore ways that rhetorical theory

might be affected by the introduction of a new rhetorical term or concept. Finally, in accordance with Timmerman and Schiappa's third methodological technique, I will discuss how paradoxography, and its rhetorical aspects, enhance our understanding of the past. I am not attempting to examine every example of the paradoxography genre, nor am I claiming that every instance of list making has rhetorical intent. Expanding on the third step of the methodology process, I accept Timmerman and Schiappa's proposal that, "The distinction between explicit and implicit/undeclared theory ought to be made that on the basis of the technical vocabulary, or terms of the art, that a given author uses such that the terms function as subjects about which predictions are made" (170). According to Timmerman and Schiappa, claiming that paradoxography was indeed a rhetorical tool can be problematic. The genre was not identified as a rhetorical tool explicitly by the writers who employed the format. Many examples of paradoxography can be found before the term "rhetoric" was first used. Also, it should be noted that the term paradoxography was coined in the nineteenth century. While exploring the rhetorical implications of the genre contributing to the history of rhetoric, I will acknowledge the historical contexts, both past and present, of the terms I am proposing to include.

What is Paradoxography?

Ancient paradoxography is found throughout Ancient Greek and Roman Classical texts. Paradoxography can be roughly defined as list making of mirabilia (marvels), miracles, and novelties. In his book, *The Edges of the Earth in Ancient Thought*, the classicist James S. Romm defines the ancient genre in the following way:

The Hellenistic genre of paradoxography or "marvel-writing," a pseudoscientific precursor of our own "believe-it-or-not" collections, is similarly constructed in great denotative lists.

This genre, which emerged in the third century B.C. as a spin-off from Aristotelian biology, essentially consists of catalogues of all the most bizarre and unintelligible phenomena of nature (92).

Romm's work assesses Ancient Greek writings on the exploration of India and Africa. He discusses writings by Aristotle and Strabo and their relation to Alexandrian mythology. Romm focuses on facts versus fictional relations of foreign lands, people, and animals, and outlines attempts by the ancient authors to use modern science to make sense of the natural world.

Paradoxography is present in Aristotle's *History of Animals*, Pliny the Elder's *Natural History*, *The Geography of Strabo*, Herodotus's *Histories*, *The Attic Nights of Aulus Gellius*, catalogues composed by Hesiod, as well as in the writings of Homer and Ovid. Johnson, a classicist who focuses on ancient religious texts, writes:

For Paradoxographers...("wonders") were discrete instances of strange and notable natural phenomena which on their own required no historical explanation. Accordingly, these writers organized their stories into individual segments with no collective thesis or unifying narrative. Sometimes they would order the segments alphabetically or by the region, or group them into thematic books, but normally the discrete units follow no pattern at all (176).

Hansen, who translated and annotated *Phlegon of Tralles' Book of Marvels*, provides a helpful history and explanation of the genre in his introduction. His translation from 1996 provides a helpful commentary to the text with insight from a historical perspective. Hansen, through extensive research, provides context to a work that on the surface, seems to be purely sensational. *Phlegon of Tralles' Book of Marvels* contains elements of the marvellous, but also census data, examples of modern literature, and folklore. Hansen also argues for the dismissal of the idea that there was any subtextual intent in the compilation. Hansen addresses the history of the genre in

the following way:

The *Book of Marvels* belongs to a genre of writing for which the ancients themselves had no special label, and which classical scholars call paradoxography ‘writing about marvels,’ a term introduced in the early nineteenth century by Antonius Westermann, the editor of a collection of Greek writers on wonders... As an independent genre of writing, paradoxography seems to have come into being at the confluence of two trends in Greek literature. One was an interest in the wondrous...A second trend was a fashion for compilations (2).

These definitions come from classicists who have traditionally extracted other helpful information from the marvel writing. Little attention has been given to the intent behind the structure or the opportunities that are made possible for audience engagement when using listing format. The genre was also heavily utilized in scholarship at the Library of Alexandria and examples can be found in Islamic literature, but I will not be examining those in this thesis.

Ancient paradoxography has also been studied by historians of science as they follow a chronological progression of marvel writing as the precursor to science writing. In *Wonders and the Order of Nature: 1150-1750*, Lorraine Daston and Katharine Park discuss the tradition of ancient paradoxography as the inspiration for wonder and marvel compilations in the medieval period. In their discussion of Gervase of Tilbury, a thirteenth-century noble and imperial counselor, they write:

Like his analysis of wonder, Gervase’s list of marvels was broadly typical of contemporary learned literature. It represented, if not a fixed canon of individual phenomena, then certainly a canon of the *types* of things that thirteenth century readers would expect to find

in such a list. This canon was not a medieval invention. Gervase's wonders were for the most part the classic wonders of Greek and Roman paradoxography, a literary genre that had grown out of the Aristotelian project of compiling descriptive histories of natural phenomena and had coalesced in the third century B.C.E. in the form of catalogues of things that were surprising, inexplicable, or bizarre (24).

According to Daston and Park, Gervase of Tilbury offered his own explanation of the seemingly meaningless process of compiling lists of marvels. "First, he traced the emotion to two roots: experience of the novel or unexpected, and ignorance of cause" (23). As for their explanation on the genre, Daston and Park believe ancient paradoxography was possibly composed as books for rhetoricians (24). Although Aristotle did compose an early encyclopedia and many writers modeled their compilations after his style of composition, I would argue that the genre predates Aristotle since parataxis has been found in works by Ovid and Homer.

Greek orality should also be taken into consideration when discussing historiography. Rhetorical practices were undoubtedly influenced by the era of pre-literate communication in Ancient Greece. One possible explanation for the enduring tradition of paratactic and formulaicity structures as a use for recording marvels could have its origins in early orality practices. Leila Khabbazi-Oskouei writes about orality in another ancient language, Persian. The same ideas can be applied to paradoxography or list making in Ancient Greek and later translations into Latin. Khabbazi-Oskouei discusses parataxis and formulaicity in Persian argumentative discourse. She writes, "Parataxis means that orally based expression is additive rather than subordinative and makes use of a great many *ands* to introduce clauses. Formulaicity refers to "a group of words which is regularly employed under the same metrical conditions to express a given essential idea" (677). The concepts of parataxis and formulaicity as proposed in her article are significant to the

paradoxography genre because consideration of those concepts begins to reveal intent behind the compilations of lists. A detailed examination of oral cultures and the uses of parataxis and formulaicity are beyond the scope of this thesis, but if they were indeed fundamental parts of Greek orality, then perhaps they were also rhetorical techniques employed as strategies. Romm addresses the Roman author Pliny's usage of parataxis in Book 7 of *Natural History*. Romm writes, "Here Pliny does not bother to subordinate, or even connect, one sentence to another, but simply tosses each new item paratactically into his grab bag of wonders" (105). The rhetorical effect of this type of formation is common in the ancient genre. The information listed is deemed to be culturally significant by the author, and the author relies on the credibility of the assemblage of the information as a whole to create ethos. Pliny includes instructions to his audience for reading his compilation. He views his overwhelming collection of information as a reflection of nature, such as "variations of the leopard's spots or the features of the human face" (106). Examples of paradoxography span from writings on the marvellous, wonder, and anomalies of the natural world, to documentation of flora, fauna, and geography found locally and abroad. Despite variations in subject matter and intended audience, the presentation and style of the genre are consistent.

Phlegon of Tralles composed *Book of Marvels* which provides many examples of the Greek fascination with oddities. His book breaks from the common pattern of writing on natural history, science, and geography. He was known to be a court gossip and delighted in rumors coming from surrounding cities. The following marvel is an example of such, "A child was brought to Nero that had four heads and a proportionate number of limbs when the archon at Athens was Thrasyllus, and the consuls in Rome were Publius Petronius Turpilianus and Caesennius" (Phlegon 46). Phlegon's entries are examples of the Roman belief that "monstrous" births were portents or omens of evil and terrifying things to come. Phlegon was a sensationalist and probably delighted in

shocking his audience with unbelievable and terrifying tales. His book also contains records of the oldest living persons and Olympic contestants. Phlegon's entries contain minor narrative, but fit the paratactical mode of belonging to a collection of similar entries. Phlegon numbers his entries, but there is no sense of hierarchy. He often categorizes by listing in alphabetical order.

The following excerpt of paradoxography from *The Geography of Strabo* is an example of Ancient Greek imperialism. In the typical tradition of the genre, Strabo attempts to document and explain his findings during exploration of India and Africa. He frequently refers to other sources of information in his writings as a way to gain authority or to possibly escape blame from passing along fictitious hearsay. Descriptions of the marvellous are frequently found in travelogues because wonders, and the exotic, are almost always found on the edges of the known world. Strabo's descriptions, and the genre of travel writing, serve to recreate representations of other environments and foreign cultures to their audience. One advantage that Strabo had over his audience was that most of his readers had not been to India or Africa, and it would be difficult for anyone to contradict his reporting. An example of Strabo's work is the following:

Those living between the Indos and the Hydaspes who are worthy of recording have already been approximately stated. Next below are the so-called Sibians, whom we have previously recorded, and the Mallians and Sydrakians, who are extensive peoples. It was among the Mallians that Alexander was in danger of death, having been wounded in the capture of some small town. We have already mentioned the Sydrakians as mythologically related to Dionysos. They say that near to Patalene in the territory of Mousikanos and that of Sabo's...Sindomana and also that of Portikanos and others. All of these were conquered by Alexander- those living along the Indos river valley- and last there is Patalene where the Indos divides into two mouths (658).



The previous example of paradoxography represents an attempt at conquering the unknown, providing entertainment, but also transferring knowledge in a paratactical format, even though Strabo does include minor narrative. Strabo's *Geography* is a massive text that has provided invaluable information to scholars regarding the ancient world. Another engaging example of paradoxography taken from *The Geography of Strabo* is the following list of marvels found rumored by Megathanes to be found among the Prasians:

Stones are dug up that are the colour of frankincense and sweeter than figs or honey. Elsewhere there are snakes two *pecheis* long with membranous wings like bats, who fly at night, discharging drops of urine or perspiration that putrefies the skin of someone not on guard. There are winged scorpions that are excessively large, ebony also grows, and there are brave dogs who do not let go of what they have bitten until water is poured down their nostrils. Some bite with such eagerness that their eyes become twisted and in some cases fall out (659).

He criticizes his contemporaries who exaggerated Alexandrian romance legends and those who were employed to explore the foreign lands for the empire, but who were more concerned with entertaining their audiences than relaying accurate information. But Strabo often gets wrapped up in exaggeration himself. As Romm mentions, the massive amount of information contained in Strabo's paradoxography writing lends credibility to the documents by making it more difficult for the audience to isolate one item to dispute. The eye-witness account given by the author is what lends ethos to the representation of the foreign object being described, and the effects of the embellished accounts on the audience should be taken into consideration. Harvard University Professor of Humanities Stephen Greenblatt writes that early travelogues and representations made by Strabo and similar accounts written by Greek Herodotus reinforced the notion that the world is

best understood through exploration, and foreshadowed the narratives composed by explorers to the Americas. Greenblatt argues that exaggerated accounts to sensationalize the exotic were common in Fourteenth- and Fifteenth-century travelogues of European explorers. Their sensationalized descriptions of native Americans as pagan and barbaric rhetorically supported the Christian imperialistic ideas of the opportunity for laying claim to the exotic and subjugating immoral natives through conquering land.

Aristotle also utilizes the same technique of overwhelming his audience. He began a tradition of science writing when he composed an early encyclopedia on animals. He details eating and mating habits, physical descriptions, and often unexplainable quirks that he attempts to rationalize, because he would never admit to being baffled. In his *History of Animals: In 10 Books*, his detailed description of the marine serpent is an example of his taxonomic types of entries. He writes:

The marine-serpent, in colour and in the form of its body, resembles the conger, but it is darker, and more powerful. If it is captured and allowed to escape, it buries itself in the sand, which it pierces with its snout for its snout is sharper than that of a serpent. The creature called scolopendra when it has swallowed the hook turns itself inside out, till the hook is ejected, when it turns to its original form (255).

Romm remarks on Aristotle's reference to a popular Greek proverb of the time used to describe the exotic foreign lands of India and Africa, *Aei ti pherei Libue kainon*, which translates to "Libya always brings forth something new." Aristotle's interest in marvels partly stemmed from his desire to surmount the challenge of rationalizing everything unknown in the natural world (88). His interests were primarily scientific, but many composers of paradoxography had other motives such as entertainment and shock value.

There are also provocative instances of paradoxography being used with the intention of rationalizing marvels and debunking pseudoscience. Palaephatus's *On Unbelievable Tales* theorizes the possible origins of several commonly accepted myths of his time. Concerning the centaurs, for example, he attempts to make a connection between truth and myth by suggesting that the myth of the centaurs began when people witnessed horseback riding for the first time. A silhouette on the horizon of a rider and a horse from behind would certainly create the illusion of a human's torso being attached to a horse's body (30). Palaephatus, was convinced that the myths were rooted somewhere in time and based on real events. He also explains situations where metaphors had been taken literally and rationalizes misunderstandings of peoples' names as either dual meaning or literal interpretations. He was a friend of Aristotle's, and Aristotle's writings on drawing meaning from names in *Rhetorica* was surely an influence.

#### How Does Paradoxography Contribute to Concepts of Rhetorical Theory?

In the field of rhetoric, there is little to no discussion of the ethos of classification, collections, or information curation. Melanie Feinberg's research on applying rhetorical concepts to information systems is the framework that I will be using to examine paradoxography. In her series of articles, Feinberg discusses how classification systems can provide forms of evidence, make claims, and create ethos, all without containing an overarching narrative, introductory explanation, or summarizing conclusion. The organization of a system or a collection can develop an ethos of its own based on how it is organized and what information is included inside. This is called synthetic ethos and is an idea important for us to consider as rhetoricians ("Synthetic").

It provides us with a non-traditional method for creating voice through an assemblage of items when an author may not be present, or perhaps a way to synchronize the voice of many authors into one collection by focusing on the message of the curation itself to create harmony and authority.

In the study of western rhetoric, Aristotle's definition of ethos is commonly accepted. Aristotle briefly discusses how to achieve ethos or credibility when speaking. In Book II of *Rhetorica*, he writes, "There are three things which inspire confidence in the orator's own character- the three, namely, that induce us to believe a thing apart from any proof of it: good sense, good moral character, and goodwill" (1378). Aristotle is primarily concerned with the perception of ethos, character, and morality that is perceived through the text, not the actual true qualities of the speaker or author. That idea is the basis for the concept of synthetic ethos- a concept on which the genre of paradoxography relies heavily for its authority.

Synthetic ethos is a term often associated with communication and information systems. Feinberg describes synthetic ethos as, "Instead of conferring believability on an authorial persona, as with the traditional understanding of ethos, ...synthetic ethos pertains to the collection itself, as a system through which many episodes of composite authorship...coalesce" ("Synthetic", 330). A text with synthetic ethos gains credibility from the synthesis of its various components rather than from the author. Feinberg discusses synthetic ethos regarding her research on the credibility of information systems and how an audience will react, or believe, one collection over another. In her previous research, she has employed rhetoric and composition framework to information systems such as libraries, grocery stores, and thesauruses. Her argument on the synthetic ethos of collections can be applied to the ancient paradoxography genre, because paradoxography is in fact, an information system, a curated collection, and a list.

## Rhetorical Aspects of List Making

I am arguing that a close analysis reveals the audience of paradoxography genre, and list formatted literature, is persuasive to the audience despite a lack of overreaching narrative or context. The text is composed in a paratactical format and strung together with either conjunctions or marks of punctuation. I contend that this format is appropriate for either an audience who prefers a scientific (or pseudo-scientific) objective, such as with a dictionary or encyclopedia, or an audience who requires no context or explanation because they are reading purely for entertainment.

Historians of science Staffan Müller-Wille and Isabelle Charmantier's article entitled "Lists as Research Technologies" address the often-overlooked strategy behind list making. In their article, they discuss Carl Linnaeus and how his list making practices led to the development of taxonomy. They argue:

List making..., can serve as a genuine "research-enabling technology." Often adopted from domestic, commercial, and administrative spheres and transposed into the world of learning, lists exhibit the potential to generate the same kind of epistemic surplus that is so familiar today from the physical instruments that populate laboratories." And that "Lists are not stable objects of contemplation; they invite manipulation through reordering. This produces a dialectical effect (744).

In this situation, list making provides the audience with an opportunity for engaging with the information presented, through providing their own context in the absence of a narrative from the author, and also through the opportunity of collaboration to expand, subtract, or reshape the contents. This dialectical effect of paradoxography is better described by Johnson in his book, *The Life and Miracles of Thekla: A Literary Study*. Johnson's literary analysis examines

paradoxography as a method for recording miracles that were supposedly performed by St. Thekla, a woman apostatized by Paul, according to the story. Johnson writes:

Paradoxography in its Hellenistic form is, therefore, a system of organization and one with its skeleton exposed: it provides immediate and easily referenced access to otherwise hidden, or effectively lost, knowledge and it offers a textual site for extension, epitomization, and reorganization by its eschewing of the fixed boundaries of traditional narrative (178).

Because of this “eschewing of fixed boundaries,” the audience is invited to contribute in the dialogue. The listing format creates an opportunity for manipulation and reordering of the information. The list can also be added to or reduced. Feinberg writes:

This overall line of thinking suggests that an organizational scheme’s persuasiveness lies not so much in convincing the audience that the scheme is correct but in enticing the audience to explore the ways in which the scheme and its associated resources might be illuminating, how it might contribute to the reader’s own evolving interpretation of the domain of the scheme (“Evidence”, 509).

This idea of presenting the audience with an opportunity to engage with the information presented will lead to the second step of the methodology process I am borrowing from Timmerman and Schiappa.

## What is the Effect of Adding Paradoxography and the Concept of Invitational Rhetoric into Rhetorical Theory?

Feinberg builds her application of synthetic ethos upon the theory of invitational rhetoric that was proposed in an article from 1995 by Sonja K. Foss and Cindy L. Griffin. Foss and Griffin argue for the traditionally accepted scope of rhetoric to look beyond patriarchal manifestations of persuasion, change, and conquering. Invitational rhetoric is a more passive technique for building ethos, not through conquering, but by working with the audience. Invitational rhetoric was greatly influenced by feminism as an anti-patriarchal approach to traditional rhetoric: “Primary among the feminist principles on which our proposed rhetoric is based, is a commitment to the creation of relationships of equality and to the elimination of dominance and elitism that characterize most human relationships” (Foss and Griffin 4). Foss and Griffin define invitational rhetoric in the following way, “Invitational rhetoric is an invitation to understanding as a means to create a relationship rooted in equality, immanent value, and self-determination. Invitational rhetoric constitutes an invitation to the audience to enter the rhetor’s world and to see it as the rhetor does” (5).

Invitational rhetoric differs from traditional rhetorical techniques regarding persuasion. Invitational rhetoric “invites” the audience to walk with the author down the path of logic, where both author and audience will arrive at a conclusion together. Applying the concept of invitational rhetoric to the action of list making creates an open-ended dialogue of information. This idea provides justification, and exigency, to the idea of adding paradoxography writings into rhetorical theory. I propose that paradoxography should be considered as an ancient application of what we now define as synthetic ethos and invitational rhetoric and should therefore be considered part of rhetorical historiography. Synthetic ethos, in the context of paradoxography, foreshadows the

encyclopedic format of cataloging scientific data. It is important to acknowledge that synthetic ethos also allows for the author to have the opportunity to include information in their collection that could be false or incorrectly classified. In this instance, the reader, or audience, would have a much more difficult time disproving the accuracy of the collection due to the sheer vastness of the majority of the collection being mostly credible in summation. The effect of this inclusion would offer a theory that traditional rhetoric was not solely based on patriarchal forms of persuasions and aggressive dominance. Identifying instances of invitational rhetoric in historical writings would enable scholars to approach traditional material with a new perspective. It would allow for an expansion of the collection of documents that currently compose the history of the discipline by including material that has been previously overlooked.

#### How Would This Inclusion Enhance Our Understanding of the Past?

Identifying instances of invitational rhetoric in historical writings would offer scholars of rhetoric a new understanding of the traditionally accepted scope of the meaning of ethos, as well as an expansion upon the ideas that are considered traditional techniques for establishing authority and methods of persuasion. Examining paradoxography from a rhetorical perspective suggests there was indeed significant intent and compilation strategy behind what some scholars of the classics have reduced to a meaningless genre. Significant not only to developing a format for structure and tradition for collecting and organizing important information, but also reinforcing the invitational aspects of the making of science and knowledge of the natural world as an open-ended, collective assemblage of data created by a large group of participants—what Daston calls a “superhuman effort” (Daston YouTube.com). By discussing various examples of the paradoxography genre and applying rhetorical analysis, I have demonstrated that there is reason



to believe there was a logical intent driving the compilation of natural marvels: didactic and entertainment purposes. There is also rhetorical evidence to argue that conscious strategies were exploited in order to produce credibility and authority.

## Conclusion

In this chapter I have provided an argument for a re-examination of the ancient literary genre of paradoxography from a rhetorical perspective and demonstrated the tradition of encyclopedic cataloging dates back further than previously recognized by historians of science. By utilizing interdisciplinary theories from rhetorical feminism and information systems, I have argued that paradoxography was not simply lists of random information, but rather a conscious compilation of items that constructed a purposeful collection with a voice of its own developed through the concept of synthetic ethos. By examining paradoxography, rhetoricians have an opportunity to apply alternative interpretations that have not previously been considered to traditional ideas of rhetorical theory and to the rhetoric of science. Paradoxography as a genre, and the rhetorical characteristics or the encyclopedic format of data collection and presentation establish a framework for the practice of science to be open-ended. Science is a practice that is as old as humanity. The legacy of every empirical discovery is to eventually be surpassed by another, greater discovery. In order for the data that has been collected to be usable, the manner in which it is preserved and understanding how that data is communicated is of the utmost importance. From a history of science perspective, paradoxography set precedence for natural philosophers in the medieval ages, who begin to examine natural phenomena from an academic perspective. Many of these “preternatural philosophers,” as described by Lorraine Daston, were physicians trained both academically and professionally. These natural philosophers wrote in

Latin for educated audiences and sought to explain marvels on a case-by-case basis. One philosopher associated with this group was Sir Francis Bacon.

## CHAPTER TWO

### THE RHETORIC OF NATURAL HISTORY: THE LINNAEAN SYSTEM OF CLASSIFICATION

In the Genesis creation story, one of man's first tasks was to identify and name every animal. This story is often interpreted as God giving man dominion over nature. A second, more secular Genesis story emerges in the 18<sup>th</sup> century during the scientific revolution, a period of time dominated by colonial exploration fueled nationalism and the desire to capitalize on natural resources. It is of no surprise that man, once again, strives to maintain his dominion over nature by developing a naming and classification system that seeks to account and document the phenomenal (material) world. This new system for classifying nature leads to the creation of the scientific practice known as natural history: "Natural history also provided the scene for competition between ideas. Conflict between religious and secular views has often fixed on the interpretations of nature" (Farber, *Finding* 3).

Michel Foucault examines the development of natural history as an enigma of the split in thinking between the "two orders of knowledge" of history and what we now call science. A split between two epistemologies, this process was an evolution in thought resulting in the void left by moving beyond the Cartesian mechanical way of thinking about organisms (128-129). The Newtonian revolution pitted naturalists who defined nature and all beings as mechanical systems against naturalists who defined nature as organic. Naturalists who believed in a more organic system were able to collect and name specimens without having to employ a hypothesizing

universal law. Argument in Enlightenment rhetoric shifted from deductive reasoning to inductive, pushing natural history to become a formulaic science. Foucault describes the shift in thinking in the following way:

The history of a living being was that being itself, within the whole semantic network that connected it to the world. The division, so evident to us, between what we see, what others have observed and handed down, and what others imagine or naively believe, the great tripartition, apparently so simple and so immediate, into *Observation*, *Documentation*, and *Fable*, did not exist. And this was not because science was hesitating between a rational vocation, and the vast weight of naïve tradition, but for the much more precise and constraining reason that signs were then part of things themselves, whereas in the seventeenth century they become modes of representation. (129)

The practice of natural history and the language that developed through systematic nomenclature shaped the way we view the natural world in western culture. It created a discourse system for filtering and purifying our understanding of living organisms. The Linnaean system created a bridge between organizing knowledge in order to understand it and communicating that knowledge through language and representation in order to preserve it. This is why the practice of natural history cannot be disassociated from language and why the process is thoroughly rhetorical. Foucault further explains, “The theory of natural history cannot be dissociated from that of language...it concerns a fundamental arrangement of knowledge, which orders the knowledge of beings so as to make it possible to represent them in a system of names” (157). The idea of connecting a knowledge of nature and understanding its properties through the process of naming from the beginning of time when Adam names the animals in the garden in Genesis, and is presumed to have named them suitably according to their natural tendencies. Sir

Francis Bacon believed when man, “shall be able to call the creatures by their true names he shall again command them” (21). Bacon’s use of the word “again” implies a mastery of nature once possessed by man, that has since been lost, but can be reclaimed through language. This “fundamental arrangement of knowledge” also creates a hierarchy, in the context of the Linnaean system, assigning importance and value, to the identifiable parts, and the connections between forms of life that share those characteristics.

This chapter will re-contextualize incidents in natural history along with rhetorical theory to delineate an argument for examining the rhetoric of natural history as a method for exploring the spatial, symbolic, and ecological relationships between collected specimens and their cultural, historical, and political moments in time. This chapter will also emphasize how Enlightenment rhetoric continues to shape the Western perspective of the natural world through the framework and context established by empirical discoveries of the previous centuries, and their application to social theory.

### The History of the Practice

The language of natural history developed because of a rhetorical opportunity over the two hundred years spanning between the French Enlightenment and the development of molecular biology. A system was needed to understand and organize the natural world. Language is needed to validate human existence and is an essential method for processing information from observation into transference of knowledge. The study of natural history as a science began as early as ancient Greece and Rome with Aristotle’s *History of Animals* and Pliny the Elder’s *Natural History in Thirty-Seven Books*. Both of these texts were attempts to document, organize, and make sense of the natural world.

Natural history as a practice later became what literary scholar Pamela Regis refers to as “the lost paradigm” when it reached its peak during the Enlightenment (xi).

In America, natural history was a highly charged subject with deep rooted political implications in the Old World. The study of botany was of specific importance because specimens could be easily collected, preserved, shipped, and grown not just in new locations in the New World, but also in the universities and botanical garden centers of Europe. Exotic botanical specimens became an obsession in Europe, especially England, and their possession quickly became a symbol of social status. In the Eighteenth- century, tradesmen and importers such as Peter Collinson, a middle-class Quaker cloth dealer, found that importing plant specimens from the new world opened doors to elite social circles, providing him with business opportunities not available to him before. The British elite, not only members of the scientific community, came to rely on North American colonists to collect and ship the specimens.

As more new plant and animal species were being discovered and collected, it quickly became apparent to naturalists that the lack of a standard for naming and describing the specimens was a problem. The Swiss botanist Carl Linnaeus developed a binomial nomenclature system in 1735 for identifying and naming plant species based on their sexual reproductive characteristics (Farber, *Finding* 8). This system was successful because it established rules for defining identifying specimens that were “elastic” enough to incorporate anomalous particulars of the unknown. The Linnaean system was soon accepted internationally by the scientific community because of its simplistic methodology. A chart was included in Linnaeus’s *Species plantarum* that allowed this new system to be easily adopted by professional botanists and amateur plant collectors alike in any part of the world. Faber writes:

Linnaeus valued naming and classifying. For him, natural history’s goal was to construct

the catalogue of life. The discipline, although based on observation, maintained a deep, religious significance. Many later naturalists who shared his taxonomic bent did so from a wholly secular point of view. (*Finding* 21)

Many naturalists, both professionals and amateur practitioners, viewed the variety of flora and fauna in the natural world as testament to Intelligent Design, with Medieval writers such as Augustine casting wonder as the sublime, and charging Christians with their knowledge of hermeneutic to interpret the natural world. This tradition continued into the following centuries. Sixteenth- and Seventeenth-century specimen collections often followed now organization or order in display. Curiosity cabinets were curated by amateurs after forest walks and trips to the seashore with collections of evidence intended to inspire sublime wonder of the Creator. Later naturalists were driven by colonial opportunism looking to capitalize on exotic natural resources in foreign lands. Advances in medical knowledge were a driving force behind exploration, as naturalists searched for new botanical specimens that held medicinal properties. Ancient writing, many found in the paradoxography genre, were studied by Europeans searching for medical and pharmaceutical knowledge and known variations in anatomy in the natural history writings of Aristotle and Pliny.

Georges Louis Leclerc de Buffon was another influential figure in Eighteenth-century natural history. He was appointed in 1739 to manage the French Botanical Garden, the Jardin du roi, and increased the royal natural history collection (Farber, *Finding* 14). Buffon was tasked with cataloging the royal curiosity collection: “Over a period of almost fifty years, for the remainder of his life he published thirty-six volumes in which he outlined a theory of the earth and compiled a natural history of humans, minerals, quadrupeds, and birds. (A team of specialists completed the remaining untreated topics during the two decades after his death.)”

(Farber, *Finding* 14). Faber writes that:

(In contrast to Linnaeus), Buffon placed a secondary value on classification. For him, natural history as a science sought to uncover the broad outlines of the order in nature. That order constituted more than just a list of individual kinds. It portrayed a grand tableau on which natural relationships, driving forces, geographical distribution, and historical change could be recognized. To Buffon, this wondrous picture of nature inspired awe, but he consciously did not conceive of it as connected to the Judeo-Christian story of Creation, or the theological attempts to ground a belief in the existence of God in knowledge of the natural world. (21)

Buffon's monumental project for cataloging put into practice as an organizational system, combined with the Linnaean system for ordering and naming plants and animals, established a trend in natural history that would dominate the practice from approximately 1735-70 (Regis 6). The material practices of identifying, ordering, and naming became natural history in action as a "practice" and how science was made. Farber writes that:

Buffon's encyclopedia, combined with Linnaeus's brilliant work in classifying and naming, laid the foundation for the emergence of natural history as a scientific discipline during the second half of the eighteenth century...the combined result of their individual efforts was to set a new level of rigor in investigation, one that gave primary importance to knowledge gained through observation. (*Finding* 21)

This paradigm shift away from Cartesian mechanical thinking into recognizing organic relationships between organisms, habitats, and humans, created a rhetorical opportunity for describing how the development of life was commonly understood and of man's place in the world. The development of comparative anatomy and a deeper understanding of the concept of



ecosystems helped to advance understandings of interrelationships of life forms, as opposed to the idea that every form of life is merely a manufactured cog in a machine. Daston describes the philosophical and theoretical tensions of this time by comparing imagery used by Bacon and Descartes to define art and nature. Daston writes that Bacon used anthropomorphized language to assign agency to nature suggesting nature capable of craft and deliberation. Descartes described nature as passive “art” fashioned by God. Daston argues, “At issue were nature’s autonomy, God’s sovereignty, and the division of labor between nature and God” (296).

The Linnaean system was often criticized in the Nineteenth-century by English naturalists in particular who were driven by metropole nationalism to improve upon the system and create a classifying system that would more accurately reflect nature. Problems frequently arose in these attempts when naturalists were unable to agree upon which anatomical features to prioritize in order to classify a species. Proposed classification systems varied according to theological beliefs and current understandings of anatomy and evolution.

#### Systematic Nomenclature: The Linnaean System

In the opening to *Systema naturae*, Linnaeus writes, “The first step in wisdom is to know the things themselves. This notion consists in having a true idea of the objects; objects are distinguished and known by classifying them methodically and giving them appropriate names. Therefore, the classification and name-giving will be the foundation of our science” (19).

Linnaeus, following the empirical framework in the manner of Aristotle and Pliny the Elder, a tradition dating back much further than recognized by historians of science. Sir Francis Bacon expressed encouragement for ocular observation of nature in 1620 in his work, *Great Instauration*. This empirical school of thought fostered the study of nature through observation

and yet, a rhetorical approach suggests that there is not any form of transparent objective recording of physical phenomenon—once in language, it is perspectival. When new specimens were found, the name assigned by the finding naturalists would be temporary. The specimen was subject to scrutiny by other botanical researchers to determine if the name proposed was appropriate, or if there was another label more properly suited. Regis writes:

An individual is being nominated to represent all other members of that species and to none other. The thing referred to, as well as the kind of thing referred to, is fixed for all time. This process of determining the relationship between a name, and the thing named forces language to be more precise than it is usually thought capable of being (19).

The system worked like this— a naturalist in the field would start by picking one plant specimen to observe fully. They would thoroughly inspect the specimen, ideally through inspecting all parts under a microscope. Their observations would be recorded before picking a second plant specimen to inspect. Only the parts differing from the first specimen would be listed. The same process would be followed for a third specimen, etc. A table would begin to emerge around the characteristics listed. Any work previously done by antecedents would provide the starting place for constructing a table.

The system Linnaeus proposed relied on identification of the quantity of a plant's male parts that would allow them to be arranged into a system of twenty-four classes. The classes were then reduced into sixty-five orders based on the quantity and arrangement of female parts. Using this method would allow the observer to create a *genera* by using a grouping of similar characteristics.

“Acknowledging that his method did not reflect any ‘real’ order in nature, Linnaeus believed that naturalists nevertheless should use his ‘artificial’ system until he developed one that actually conveyed God’s plan in nature” (Farber, *Finding* 9).

The Linnaean system is still used in modern biology as the framework for naming new varieties of organisms. Although it is criticized by modern scientists, there has not yet been a suitable alternative suggested for replacing it. Marc Ereshefsky writes:

Many features of the current Linnaean system originated with Linnaeus, but some features are more recent additions. Linnaeus offered a hierarchy of five ranks: species, genus, order, class, kingdom. Biologists in the twentieth century have added sixteen more ranks.... For the most part, the current Linnaean system is a continuation of Linnaeus’s original system rather than a departure from it. The methods for constructing classifications used by contemporary biologists are very much in line with those suggested by Linnaeus. (361-362).

Problems with the current system are not just hierarchical in nature but are also derived from the rules the system incorporates for naming organisms. One inherent problem with the system is that it was constructed around what the scientific community all agrees to be an artificial system that does not technically coincide with anything in nature. Ereshefsky attributes this to the “underlying theoretical assumptions of creationism and essentialism (362). He writes:

For Linnaeus, taxa are the result of divine intervention, and the members of each taxon share a common essence. Of course, biological theory has dramatically changed since the eighteenth century. With the advent of Darwinism and its subsequent development in the twentieth century, creationism and essentialism have all but been abandoned. Taxa are considered the products of nature rather than divine processes. Taxa are treated as

evolving entities rather than as static classes of organisms. Despite this shift in biological thought, taxonomists still use the Linnaean system for classification. A shift in theoretical thought does not automatically undermine the effectiveness of a system of classification, but in the Linnaean system, it has. As we shall see, the Linnaean system's rules are predicated on theoretical assumptions that hinder the system's ability to accurately represent the organic world. (362)

Linnaeus recognized the need for creating a system, inspired by natural theology and natural philosophy, that could be utilized by naturalists all over the world to collectively expand knowledge of species, but he never imagined the vast multitude of life that would require individual taxon. He believed the number of genera to be in the hundreds when it is actually in the hundred-thousands. His original intent was to create a system that facilitated memorization of every genera. The framework of the system was established on understandings that are now outdated and shown to be "artificial." Since Linnaeus believed in creationism, he believed the number of species would be a constant throughout time, unchanging. Ereshefsky argues that, "The Linnaean ranks correspond to nothing in nature", and ... "there are not enough Linnaean ranks to properly represent significant branching on the tree of life" (366). This argument by modern biologists expresses the problem with having an "artificial" system. Linnaeus's contemporaries were equally critical, arguing for animals to be classified according to behavior or shared habitats, as that was more natural than a contrived "system" using similarities in dental arrangement, for example. Although Ereshefsky's expression of the shortcomings of the Linnaean system when applied to modern biology is a legitimate concern, the importance of utilizing artificial nomenclature systems should not be depreciated. This is where utilizing rhetorical theory to explore the Linnaean system becomes imperative to our understanding of the

value of natural history writing. Foucault argues, “But one cannot find the way to this natural system unless one has first established with certainty an artificial system, at least in certain of the vegetable or animal domains. This is why Linnaeus does not seek to establish a natural system immediately, “before a complete knowledge has been attained of everything that is relevant’ to his end (140). At what point will this certainty exist? When will modern botanists achieve a full understanding of everything that is relevant to their science? As long as organisms continue to evolve in response to the natural world, that full understanding may never be achieved.

### Natural History as Language

Naturalists in the field, armed with a chart and only a basic understanding of Latin, were empowered to identify and classify a species via a method accepted as credible by their peers.

Once naturalists observed a specimen, they were able to use the Linnaean system to translate their observations into a description. Foucault writes:

For its construction requires only words applied, without intermediary, to things themselves. The documents of this new history are not other words, texts, or records, but unencumbered spaces in which things are juxtaposed: herbariums, collections, gardens; the locus of this history is a non-temporal rectangle in which, stripped of all commentary, of all enveloping language, creatures present themselves one beside another, their surfaces visible, grouped according to their common features, and thus already virtually analyzed, and bearers of nothing but their own individual names (131).

The process he describes above is a purification of the natural world through discourse. Objects are presented in their individuality without an overarching narrative that dictates their reception. Agency is given to the physical characteristics of the species itself, not the context in which it is

found, or behaviors that relate it to something else through analogy. This streamlined process created a framework for establishing the material practice of natural history as a more mathematically inclined science. This results in "...a new field of visibility being constituted in all its density" (132). The sense of sight is essential to this process. Using the Linnaean system creates what Foucault calls "structure." The structure is what allows botanists to categorize a specimen: "By limiting and filtering the visible, structure enables it to be transcribed into language. It permits the entirety of the animal or plant to pass over in its entirety into the discourse that receives it" (135). Structure allows the reduction of an entire object into a "system of identities" that is then able to be clearly defined. The Linnaean system creates a discourse that becomes a language not bound to national identity, but one that is able to be understood worldwide. The language of natural history is also a method for describing every organism in the natural world. All of this is achieved by means of describing what one is able to observe. Regis writes that this system established a literary style and rhetoric that provided a format for sentence and discourse structure (15). Natural history discourse becomes a cyclical evolution between sight, language, and structure. Once the visible specimen is translated into language, it can be manifested into another representation of the likeness of the specimen through art, or as Greenblatt says, a mimesis representing a foreign culture and environment. Specimen drawings were frequently submitted with annotated descriptions and often accompanied the specimen samples themselves. Specimen samples rarely survived before advancements in preservation techniques.

Naming of the natural world has historically been associated with mastery and ownership since the beginning of time. Michael Guadio writes that Foucault defines natural history in a similar fashion to the Genesis story:

Foucault's definition ...boils taxonomy down to its two irreducible elements: seeing and the naming of that which is seen. But what is the relationship between these two elements, and what bearing might that relationship have on natural history's dialogue between surface and depth? The task of the artist-naturalist, it would seem, is aligned with the former, with the God-like task of rendering nature's surface visible and ready for naming...The artist-naturalist aspires to display nature's objects in their object reality, independent of the individual mind that perceives them. But when it comes to naming (Adam's task), the artificial element of human language is introduced, and with language come all the ideas and patterns that the human mind inevitably projects onto the world.

(58)

The Linnaean system of binomial nomenclature together with the practice of organizing and cataloging data successfully reformed natural philosophy to secure its place as a science expressed in a reductive formula. The rhetorical properties of these material practices work to archive data in the necessary mode to further the pursuit of science, as Daston describes in her interview on the Science of Archives. The collected information, and the language of natural history, transcend continents, language barriers, and time, to contribute to the canon of knowledge of the natural that has existed since the beginning of time, and will continue to be utilized for all further empirical discoveries. These systems drove the paradigm change in material practices and scientific theories to become the framework of natural history as a practice.

## Conclusion

Although modern biologists criticize the Linnaean system and all of its deficiencies in regards to our contemporary understanding of evolution, Foucault argues for recognition of the importance of the system because of its vital role in our understanding of ourselves and our relation to the natural world—a methodology that has been used for expanding natural philosophies, answering questions about God and nature, and has often been problematically utilized as a hierarchical method for assigning value to life. The universal language of natural history which developed as a result of systematic nomenclature allows us to link and categorize objects in a way that was not previously at our disposal before the enlightenment. In natural history discourse, the Linnaean system is seen presented in the format of an annotated list. Plant species are listed with a brief description on their distinguishing characteristics. These lists are often assembled together inside of larger pieces of travel writing when describing a place, or found within letters, and presentations. Frequently, a physical specimen would accompany the discourse. A large assemblage of specimen lists would compose a catalogue, to serve as an “up-to-date version of the information” and often featuring tables of information demonstrating the Great Chain of Being (Regis 18).

From a rhetorical perspective, the invitational, open-ended characteristics of the Linnaean system promoted understanding the world through identifying individual characteristics for oneself through observation. In colonial America, naturalists were empowered to make significant contributions to science that help to shape America’s identity during the post-Revolutionary period. Even though Linnaeus himself admitted to relying on an artificial connection between organisms, his system structured the visible world in a manner that could be



processed and transferred. “Between language and the theory of nature there exists therefore a relation that is of a critical type; to know nature is, in fact, to build upon the basis of language, a true language, one that will reveal the conditions in which all language is possible and the limits within which it can have a dominion of validity” (Foucault 161). Linnaeus structured his system in a manner that address what Lorraine Daston considers to be the motivation behind practicing science: first, there was an individualistic motivation for having the opportunity to be credited personally with an empirical discovery; which often resulted in becoming immortalized by having a species named after the discoverer; but also a second motivation with great appeal to many naturalists, which was their role in contributing to a collective, superhuman, utopianistic effort of “making science” that would in some iteration, outlive every civilization (Daston YouTube.com).

Linnaeus was able to break away from the Newtonian school of scientific thinking and created a practical system for imposing order over nature rather than by subjecting nature to hypothesis and experimentation. Ironically, this same order imposed by humans over nature was the human interpretation of a system of organization believed to be already present. Through this relation, societies also sought to impose the same order, or hierarchy, over all life, invoking nature’s authority. The simplicity of the system ensured its enduring success, so much so that it is still the primary system utilized today, although it has been modified and expanded upon to accommodate evolution.

Historians of science have addressed how systematic nomenclature has provided a framework for advancements in modern science. Researching the rhetorical structure of the Linnaean system of nomenclature and the development of the language of natural history can suggest ways in which today’s science and environmental rhetoric can proceed. A deeper

understanding of the concept for ordering highlights the continued effort of humans throughout history to impose order over nature. The Linnaean system established the building blocks of modern biology, but also created an opportunity, especially in the American South, for appealing to nature's authority in order to justify through deduction slavery, racism, and rebuffing ideas of social mobility. For example, the idea that Afro Americans were not of the same species as Anglo Europeans did not justify slavery. But, the idea that Anglo Europeans, as the more fully developed species, had a "moral" obligation or authority to control Afro Americans, combined with the economic necessity of slavery to support the plantation system economy, provided motivation for defending the institution of slavery. The ideas being debated in naturalists' circles around hierarchies of species, The Great Chain of Being, and stable natural kinds (hybridity theories), helped to establish ontological identities of those engaging in scientific developments— mainly white Anglo Europeans in North America. In this context, the ideas of hierarchy are philosophical, but not theological.

## CHAPTER THREE

### PHILIP HENRY GOSSE AND THE RHETORIC OF NATURAL HISTORY AS SCIENCE WRITING

In 1830, British naturalist Philip Henry Gosse (1810-1888) moved to rural Alabama to become school master at Pleasant Hill after an unsuccessful attempt at establishing a farm in Canada. During his time in North America, Gosse participated in the circulation of scientific data through his connections with the American Philosophical Society. As a natural philosopher metaphysics is a common theme in his work as he attempted to reconcile science with religion, and the rhetoric of wonder is often present in his writing, in the Augustinian fashion. Gosse's specimen drawings, letters, journal entries, and other publications reflect his belief in creationism and pre-Darwinian theories of science. Gosse's curiosity of the natural world reflects the historiography of early science writing, although the subject shifts from fascinations with portents and monsters to other strange phenomena in his search for unfamiliar species as he explores the North American South.

To rhetoricians of science, Gosse's work should be of interest because it is helpful in mapping the evolution of science writing of natural knowledge and science writing of the American Enlightenment. Gosse, as a scientist, was the epitome of the paradigm change, considerate of new theories of evolution in his research, while maintaining consistency in the quality of his work through good material practices of established systems— an ambivalent writer equally affected by a visceral sense of wonder and the intellectual advances of his time.

Driven by exploration of the New World and capitalistic endeavors of colonialism, Christian imperialism, and advances in medical pharmacology, the approximate two hundred year span beginning with the French Enlightenment and ending with the advent of molecular biology, was characterized by a concentration of the efforts that developed into Natural History as a practice. Before natural history split into the hard sciences, early science writing was mostly collections of information, qualitative with description and observation, utilizing the Linnaean system to identify an unknown specimen by comparing its physical qualities as much as possible to determine its closest known relative, in the same manner that humans have historically strived to make sense of the unknown. The circulation of natural history knowledge was mostly epistolary, with exotic specimens collected and passed around through the scientific circles of North America and Europe. Naturalists acquired reputations for themselves and strengthened ethos through their capacity to recognize physical qualities of a specimen and group that specimen into a collection with others. The nature of science as it was then, and as we know it now, has always been an evolving process, moving to expand in some areas while contracting in others, based on the assemblage of knowledge created by networked groups of participants expounding upon each other's efforts, reproducing experiments in order to create laws, building upon those discoveries, and disproving theories—leading to a multidimensional network of knowledge creation.

The endeavor to understand, and manipulate, the natural is at its core, riddled with questions of ethics. Similar to Richard Dawkins's concept of memes reflecting cultures, scientific theories reflect cultures and related ethical tensions (Dawkins 206). To rhetoricians of science, natural history manuscripts as an early form of science writing are important not only because the genre has been historically under-studied, but also because the historical application of natural philosophy as applied to social theories has had a lasting effect on the ontology

identity in the metaculture of the Western world. Eighteenth- and Nineteenth-century theoretical arguments on how life should be identified, and therefore categorized into hierarchies, has guided how humans make sense of the natural world and assign value to the life within it.

Methodology to be Applied to Gosse's *Letters from Alabama*

In *Communicating Science: The Scientific Article from the 17th Century to the Present*, Alan G. Gross, Joseph E. Harmon, and Michael S. Reidy provide the initial framework for rhetoricians of science to analyze rhetorical properties of science writing. Gross et al., apply rhetorical analysis to the scientific article genre to survey techniques and styles science writers have used over time to establish authority and convince other members of the scientific community and the public of their findings. There is very little research, especially by rhetoricians, on the rhetoric of natural history as a science, using the framework proposed by Gross et al. The authors have "...identified three aspects of method: defining the components that make up communicative and argumentative practices in science, sampling the scientific texts that will be the object of analysis, and accounting for change over time" (8). Style, presentation, and argument are the features that Gross et al., will survey for their analysis. "Style" is defined as the "term for any feature of a text whose focus is the syntax of sentences or the choice of words" (9). The authors define "argument" as "the actual ensemble of means scientists employ to support their claims. The authors discuss the evolutionary theory of conceptual change by first defining the concept, and then explaining how the theory is applied to the scientific article's development over time. "In the case of style, we see the quest for an objective and efficient prose as the selection pressure; in the case of presentation, we see the quest for efficiency in reading and searching; in the case of argument, we see the pressure of other arguments, arguments that force

the originators to modify or discard their own” (15).

In addition to rhetorical methodology as utilized by Gross et al., to assess scientific articles, I will also use the concept of vitalism, in the context of Jane Bennett’s New Materialism. New materialism, Bennett describes the theory in *Vibrant Matter: A Political Ecology of Things*, can be used to define the tension seen through natural history writing, as humans struggle to master the natural world. Agency fluctuates throughout the paradigm shift between humans, God, and nature, as natural theology and natural philosophy manifest through the material practices of making science—in other words, humans acting upon nature, and nature acting upon humans. In this context, new materialism works to explain how through the rhetoric of describing and categorizing the qualities of the natural world, the physical sciences become intertwined with social science. Bennett defines “vitality” in the context of her discussion in *Vibrant Matter*.-By ‘vitality’ I mean the capacity of things — edibles, commodities, storms, metals — not only to impede or block the will and design of humans but also to act as quasi agents or forces with trajectories, propensities, or tendencies of their own (viii). Bennett argues the importance of recognizing the capacity of non-human objects to influence or affect humans. The term Bennett uses to describe empowered objects is “actant,” which she borrows from Bruno Latour. Bennett defines “actant” as, “...a source of action that can be either human or nonhuman; it is that which has efficacy, can *do* things, has sufficient coherence to make a difference, produce effects, alter the course of events” (viii). Bennett summarizes Latour’s creation of a vocabulary for the scope and scale of thing-power capacity.

Another application of new materialism that can be applied to natural history writings is the idea of “creolization,” as defined by literary scholar Monique Allenwaert. Allenwaert describes the idea of the alteration of a body through synthesizing with matter found within an

environment. She defines the term “creolization” in the context of her research as:

...the movement of human beings from one place to the other as well as the effects of the fast-growing plants and ever-present insects [which] produced transformations of the human body and psyche...we might understand creolization not simply as a cultural phenomenon, but also as a material and even ontological phenomenon that described how the substances and agencies that interacted in and thus composed a given place, as well as the economic conditions particular to this place, produced bodies and forms of personhood in which diversification became primary (6).

The concept of creolization can be applied not only to colonists occupying a new world, but to the import and export of exotic specimens taken from and brought into foreign ecosystems. The interest in naturalization was often driven by the capitalistic endeavors of colonialism and attempts to monetize natural resources through assimilating exotic flora and fauna into local habitats. Through the process of creolization, the natural world is assigned agency and what Bennett calls “vitality.” Humanities scholar Stephen Greenblatt uses Marxist theory to explain how capitalism fuels circulation and reproduction, or mimesis, of foreign cultures and environments, and the literary devices that allow for their circulation. Greenblatt argues that these representations, “...achieve reproductive power, maintaining and multiplying themselves by transforming cultural contacts into novel and often unexpected forms” (6). In this manner, through their circulation, representations of natural history in both literary and physical specimen forms, gain agency and vitality.

Philip Henry Gosse (1810-1888), British-born naturalist and renowned member of the Royal Society, made significant contributions to our understanding of the science of the natural world. His biographer, Ann Thwaite, describes Gosse as, “the most popular natural history writer

of his day,” and writes that, “The Royal Society considered on his death that ‘no man has ever done so much to popularize the study of natural history in England’ (xviii). Gosse exemplifies the Victorian conflict between religion and science, as he worked alongside his controversial contemporaries, Charles Darwin and Charles Lyell, among others, introducing theories that served to organize and make sense of the world. Gosse’s writings will serve as artifacts for examining the distribution of agency according to Enlightenment ideas regarding science and religion. Gosse is a figure of regional significance in the North American South who has not been studied by rhetoricians, although there is currently renewed interest in his work in the fields of history and science. The University of Alabama Press is currently working on a series of publications on Gosse’s work. Gosse should be of interest to rhetoricians because his writings contain insight into the social consequences of enlightenment thought, while his sketches of botany and insects demonstrate how objects of the natural world become “actants”— all part of the shift in scientific paradigms of his time, trending movements away from mechanical thinking and towards recognizing organic relationships between organisms, habitats, and humans, created a rhetorical opportunity for describing how the development of life was commonly understood and for providing lasting theoretical framework and context for explaining religion and the natural world. Gosse is both a natural theologian and a natural philosopher.

Throughout his writings, Gosse incorporates modern scientific theories according to the paradigm changes but remains devoted to his belief in intelligent design. Gosse follows the Baconian tradition of empiricism and strived to expand the canon of natural history knowledge by describing exotic species and providing epistemological and methodological explanations for natural phenomena. This type of empiricism required an open-mindedness on the part of the naturalist, making Gosse less likely to dismiss the incredulous without thought. He often muses



on what he calls “the marvellous” and wonders of the natural world that could not be explained by cohorts. Gosse was a dedicated scientist, knowledgeable in contemporary theories, and a conceptual thinker.

### Philip Henry Gosse’s Letters from Alabama: Chiefly Relating to Natural History

After an unsuccessful attempt at farming in Canada, British naturalist Philip Henry Gosse traveled to Pleasant Hill, Alabama, a rural town in present day Dallas County, to assume the position of headmaster in 1838. Although his primary interest was entomology, Gosse utilized his spare time in central Antebellum Alabama to document the exotic flora and fauna of the region, often relying on information provided by other naturalists who specialized in botany, ornithology, and mammalogy to identify the natural world around him. Gosse participated in the circulation of data among members of the American Philosophical Society.

Gosse kept a journal of his observations and discoveries, but also transcribed excerpts of his journal notes into a series of epistolaries which were later published in 1859 as *Letters from Alabama*. *Letters from Alabama* and consisted of journal notes written in epistolary form, a common genre for natural history writing in the colonial context. Christopher Iannini writes:

Throughout much of the eighteenth century, the demand for factual eyewitness reports on New World nature provided one of the primary channels— in many cases, one of the only reliable channels— through which learned provincials could take part in the broader intellectual culture of the Atlantic world, refashioning themselves as enlightened authors and subjects. In doing so, such authors learned to negotiate complex imperial assumptions about the proper function and form of colonial reportage, whether by composing personal letters that demonstrated their command of metropolitan norms of

politeness and sociability or innovative first-person narratives that frequently subverted and parodied metropolitan theories regarding the degenerate mental, physical and moral constitution of the creole settlers (5.)

Gosse journals his experiences living in the small community and witnessing daily life of a plantation-centered economy in Pleasant Hill, AL, allowing him to participate in a moral assessment and cultural exchange with descriptions of colonial slavery, understanding it as an essential component to the plantation-centered economic system and its part in ideas of modern progress. He also chronicles his eye-witness accounts of botany and insects from the field, his experiments, and his empirical scientific observations, in the manner of Baconian empiricism with a specific purpose of enlarging the canon of knowledge of the natural world and correcting erroneous generalizations of species through very close observation and study. Gosse's writing style is typical of early eighteenth-century science writing, as defined by Gross et al., as evidently influenced by a Baconian philosophy of science, "...a philosophy that privileges fact gathering and eschews theory" (20). In the Gosse's view, "...this systematic fact gathering will issue in unproblematic truths about nature, he can eschew all interpretive problems and the arguments such problems inevitably entail...the facts will speak for themselves, explanatory talk is rare...(20). This style of writing features "suggestive evidence" rather than any theoretical confirmation and is a typical style of scientific writing in the Seventeenth-century.

Gosse's descriptions are qualitative, and he frequently utilized metaphor and anecdotes to convey his findings as opposed to quantitative, data-heavy descriptions found in scientific articles written towards the end of the century that made use of heavy data, tables, and graphs. Although *Letters from Alabama* is composed in a Belletristic series of letters, it also serves as a massive compilation of information documenting the natural world serving a purpose similar to

Buffon's encyclopedia, peppered with romantic style narratives from Gosse. Evoking ethos from Linnaeus and Buffon by utilizing the material practices of the Linnaean system of binomial nomenclature, and the practice of cataloging data, allowed him to gain credibility by participating in a conversation between the most esteemed naturalists of his time. By applying the Linnaean system of binomial nomenclature to the natural world around him, he was empowered with this same endemic assumption - not only a way to identify flora and fauna of the New World, but to apply the same principles of reasoning to any subject of which he strived to make sense. He utilizes the Linnaean system not only to identify, but to order and make sense of his findings. Although the Linnaean system is "artificial," meaning it does not follow an established order already present in the natural world, it is the most scientifically consistent.

Regis writes that through the use of the Linnaean system, naturalists in the New World were able to describe specimens they encountered in a way that Europeans could make sense of—by outlining distinguishing characteristics of a specimen that readers would find both foreign and familiar (20). Gosse refers to the Linnaean system in *Letters*, suggesting it is the point of reference and the primary source for every naturalist to utilize identifying the unknown. He writes, "From the center stand up four nectaries, on the long slender filaments resembling stamens, so that I know no flower more likely to puzzle a student endeavoring to find its name in the Linnaean system" (155). Although there were competing ideas such as the linear idea of the chain of being, Quinary nature, and organization by affinity, Gosse utilizes the traditional Linnaean system for identifying novel species in the New World.

The following passage can be taken as a sample for style most frequently used by Gosse to describe specimens. Gosse writes,

A fourth species is the largest living butterfly I have ever seen, being upwards of five

inches, tip to tip, of the expanded wings. I call it the Black Emperor Swallow-tail (*Papilio Glaucus*); It is a very noble fly, and forms quite a contrast to the dusky pygmies I just now noticed. Its color is deep black, with two marginal rows of crescents; and within them a row of larger azure crescents, which are obliterated towards the tips of the first wings; the second pair has a large cloud of azure dots in the center. The undersurface is much the same, but the black is more dusky; the crescents in the second wings are larger and tinged with orange, and the azure center cloud is wanting (110).

Here Gosse is following the process of the Linnaean system using observations of physical characteristics to describe the species. These remarks not only provide a visual for readers, but will be quantified by Gosse and his scientist peers to order the species into the category in which they can best see that it fits, according to location of anatomical parts, coloring, and quantity.

Gosse continues:

It appears to be rare, as I have seen only two specimens of it, but one of which I succeeded in obtaining. This I caught in a garden just as the sun was setting, hovering over a strawberry-bed; the other was seen in the middle of the day, but in the dark shade of the woods; I gave chase to it, but it redoubled its speed, and was soon out of reach in the forest. I observed that it flew high, which butterflies do not generally do. The larva of this fine species is said to be in all respects like that of the Tiger Swallow-tail (*Papilio Turmus*), being of a fine green, with two eye-spots on the thickest part of the body (110.)

By including a description of the circumstances for his audience under which he observed and was able to catch the specimen, Gosse is demonstrating awareness that his readers will most likely never locate a living specimen themselves, but will find details of the specimen's habitat pertinent. Preserved specimens were circulated within the scientific circles, but much could be

gleaned from knowing details of the ecosystem and behavior of the species. Gosse was knowledgeable of the current conversations and debates challenging the systems used to identify and organize new specimens. Gosse's description demonstrates the changing paradigms as evolutionary theories, the importance of geographical location to the proposed idea of species only inhabiting "natural provinces" as designated by the Creator, conditions under which naturalization into new habitats would be successful, as well as challenges to the system of ordering by prioritizing the behavioral habits (analogy) of a species over their likeness to other species (affinity) for purposes of categorizing.

Allewaert discusses analogy as a methodology in taxonomic practices, especially in the field of botany. Analogical logic, frequently used by vitalist materialists:

... strives to reconcile the diversity of individual cases with the unity of nature...analogy promises, first, that the entities brought into relation are self-identical and, second, that these entities are not simply thrown into a catalogue in which any sort of combination is possible but are carefully arranged in an interlocking series governed by a mimetic logic in which the workings of one life-form reveal the workings of another without allowing one case to be reducible to the next (63).

New materialism as applied to anatomy highlights the importance of the individual parts, and the priority given to those parts for deciding classification. Allewaert continues:

...analogy was also an especially effective tool for neutralizing the more unsettling consequences of vitalist materialist thought; namely, that no entity is identical to itself because it is constantly in relation to and has the potential to combine with other bodies with which it composes an environment...Thus, if vitalist materialist thought verged on proposing the non-self-identity of all life-forms, the analogical method returned identity;

concept and method, in short, worked to different ends, or, more aptly, method worked to blunt the radicalism of the concept (64).

Gosse uses analogy in the Baconian tradition of empiricism in order to clarify descriptions of his observations. Gosse uses analogy to describe a Zebra Swallow-tail butterfly chrysalis as “short and thick, shaped almost like the body of a pig, with a sharp thorax” (60); and the tongue of a Sphinx moth as “looking very much like the trunk of an elephant” (71). Allewaert writes that the use of analogy was a typical eighteenth-century methodology with roots found in Christian religious thought. “Unlike mechanistic mathematical methods that strive for universal laws, analogy strives to reconcile the diversity of individual cases with the unity of nature (63).

I have applied the methodology of Gross et al., to Gosse’s passage and have found it to contain similar style to scientific articles dating back to the Sixteenth-century with a focus on fact over argument. Intellectual territory is not yet being claimed, other than that Gosse is positioned to be one of the first naturalists to observe a specific species. Gosse’s description and preliminary ordering of the species functions as invitational rhetoric to be evaluated by his audience and those naturalists deemed to be authorities in entomology. His peers will then utilize the information he provides to elaborate upon his description and order other species with similar qualities. The influence of a Baconian philosophy of science is evident, “...a philosophy that privileges fact gathering and eschews theory” (Gross et al. 20). According to Gross et al., “...this systematic fact gathering will issue in unproblematic truths about nature, he can eschew all interpretive problems and the arguments such problems inevitably entail...the facts will speak for themselves, explanatory talk is rare...(20). The article features “suggestive evidence” rather than any theoretical confirmation and aligns with science writing of the Seventeenth-century.

Although Gosse appears to be at the forefront of scientific theories of his time, in some

ways his style reflects science writing of the Seventeenth-century which incorporated religious beliefs into the practice. Gosse's frequent references to God and Christianity, which reflect his belief in creationism, another characteristic of pre-Darwinian early eighteenth-century science writing. For example, Gosse concludes his description of a sphinx moth by writing, "...but as it is, who does not see the hand of God in all of this?" (72). To Gosse, the diversity of species evoked wonder and but also marvel of the Creator. After naming a variety of species found in a marsh in a single night, Gosse writes:

...you may have some distant approximation to one idea of Him, who 'openeth His hand and satisfieth the desire of every living thing.' EVERY LIVING THING! I have often thought that no one can appreciate the grandeur, the sublimity, of this sentiment of the Psalmist, like the devout naturalist (128).

Gosse's place in the making of science is of both the natural theologian and the natural philosopher. He viewed the diversity of the natural world with a sense of wonder. Although it is clear that Gosse is religious, he never quotes from the Bible in *Letters*, although he does reference God and demonstrates his belief in intelligent design.

Gosse not only documented local flora and fauna during his time in Alabama, but also observations on social theory. His commentary on human behavior would not have been considered to be out of line with the common practices of contemporary naturalists. However, *Letters from Alabama* does not mention the conversations circulating within the scientific community regarding race, such as evolutionary theories of pluralism, polygenism, and the idea of "natural provinces". Regis writes that the idea of races as separate species was prompted by Linnaeus when he divided man into more than one species in the 1758 edition of *Systema naturae* (22). Gosse writes that after witnessing the horrors of slavery, he "had never felt so

strongly.” Gosse writes:

In spite of beauty and the grandeur of the country, the lucrative remuneration which a person of education receives for his talent and his time, and the rich and almost virgin field for the pursuit of natural history (no small temptation to me), —I feel slavery alone to be so enormous an evil, that I could not live here: I am already hastening to be gone (198).

Gosse’s correspondence with his connections within the scientific community of naturalists in both Europe and North America would have kept him knowledgeable of the range of theories circulating at the time regarding race and any proposed hierarchy in classification.

Historian Lester Stephens addresses scientific theories applied to social theory in *Science, Race, and Religion in the American South: John Bachman and the Charleston Circle of Naturalists 1815-1895*. Stephens writes that it was common practice for naturalists during this time who studied mammals to base their comparisons on specific “diagnostic characteristics to classify mammalian species, including humans” (Stephens, xiii). These characteristics were generally physical, such as the number of teeth, shape of the head, etc. in the typical manner of the Linnaean system. Around the time that Gosse was traveling to Alabama, naturalist John Bachman was circulating treatise in support of theories of transmutation of species, or species who filled gaps as missing links in the chain of being (Stephens 42). These theories proposed hierarchies of development which were applied to humans, and it is probable that Gosse was aware of such theories as he was making social observations during his time in North America. In one instance of describing entomology, Gosse refers to the White-spotted Skipper as being “more like a moth than a butterfly, and serves well to be one of the connecting links between the diurnal and the nocturnal Lepidoptera” (68), implying his acceptance or at least consideration of



transmutation theories. Bachman later retracted his opinion as he grew more averse to Lamarckian theories of evolution, but not until nearly a decade after Gosse had left the South. Bachman was a minister and one of the few naturalists in the South who argued against the pluralist theory of separate human species, however, he supported slavery because he “genuinely believed that the South was seeking to convert blacks to Christianity” (Stephens 181). Stephens writes, “Bachman contended that whites underestimated the intellectual capacity of blacks, but he nevertheless believed that Africans were decidedly inferior in mental ability (198). Gosse, an entomologist and recognizing his lack of expertise regarding mammal identification, refers to “Dr. Bachmann, of South Carolina,” and his expertise as a mammologist when identifying a fox squirrel, utilizing Bachman as a source for creating ethos for his own credibility in accurate observations when describing a local species of squirrel (Gosse 114).

Gosse observed the abuse and ill treatment of the Afro American servants and slaves, and although hesitant and fearful of becoming involved publicly in any intervention, he did write briefly about his observations. On more than one occasion, Gosse quotes from William Cowper’s *The Task*. Cowper, a popular English poet, was also a well-known abolitionist. Several of Cowper’s poems contain anti-slavery topics, arguing against the financial profitability of slave ownership. Gosse describes an affinitive quality of the human species when he writes:

The darkest side of the southerner is his quarrelsomeness, and recklessness of human life. The terrible bowie-knife is ever ready to be drawn, and it *is* drawn, and used too, on the slightest provocation. Duels are fought with this horrible weapon, in which the combatants are almost chopped to pieces; or with the no less fatal, but less shocking rifle, perhaps within pistol distance. Slavery, doubtless, helps to brutalize the character, by familiarizing the mind with the infliction of human suffering. If an English butcher is

popularly reputed unfit to serve on a jury, an American slave-owner is not less incompetent to appreciate what is due to man (195).

Gosse continues to write that he had intended to convey a few of the horrors he had witnessed of “the domestic institution,” but is hesitant to be a source of information, or to seem sympathetic or curious of their condition. Gosse seems to have a thorough understanding of the deplorable conditions imposed onto Afro Americans. He overheard confidential conversations of “instruments of torture, devised with diabolical ingenuity...said to be used by planters of the highest standing...”, floggings, poor living conditions, lack of food and insufficient clothing, armed patrol parties and trained dogs that pursue runaways and “not unfrequently kill their victims,” and “utter privation of all intellectual enjoyment” (196). Gosse understood the legal, political, and economic implications of slavery, as well as the need for a solution for providing aid to a massive group of people upon emancipation. Although seemingly empathetic to suffering endured by Afro Americans, Gosse’s opinion regarding theories of racial hierarchy is unknown at this time. Gosse observes Afro Americans in their work and daily lives at home and relays his observations to his audience in a manner that is arguably problematic, as discussed in more detail in the following paragraphs. Gosse does not write about Afro Americans in the same style in which he describes the planters and overseers, instead his style aligns descriptions of Afro Americans with his anecdotes of animals.

Gosse uses anecdotes to relate amusing or entertaining events. In three of these anecdotes, Gosse anthropomorphized animals by giving them a formal name and describing them as if they were human characters, Bruin the bear (174-175), Squggy the squirrel (114), and Reynard the fox (209, 230). Bruin and Reynard are both common names for animals in folklore. Gosse also conveys a story about a slave in which he refers to the slave as “Sambo.” Although it

is possible that the slave in the story was named “Sambo,” it is probable that Gosse also borrowed this name from popular folklore stories, as he did for the animals. By using a style similar to the animal anecdotes, it projects that Gosse may have seen, or was beginning to see, the slaves as subhuman, as the planters did, and appears to have zoomorphised the humans in his story (178.) Gosse writes:

As soon as the field work was done, and supper swallowed, preparations commenced. The overseer blew his horn to call such of the hands as were within hearing, out of whom some half-a-dozen were selected, nothing loth; for Sambo likes the wild excitement of a hunt, especially by night, as well as his betters, and enters into it with as much zeal and zest (178.)

Monique Allewaert proposes a theory that may explain the manner in which Gosse writes about Afro Americans, reminiscent of earlier natural history writing which incorporated traces of superstition and wonder. Allewaert writes:

One of the consequences of this creolization ontology is that the integrity of the human being as such was threatened. This threat was nowhere more evident than in Anglo-Europeans’ categorization of Africans and Afro-Americans as not entirely human, or as what I call *parahuman*. Parahumanity...describes the slave and maroon persons who seventeenth- through nineteenth-century Anglo-European colonists typically proposed were not legally or conceptually equivalent human beings while at the same time, not being precisely inhuman. They were thus beside the human—they were *parahuman*... colonial texts typically understood African-descended human beings as constituting a kind of interstitial life between humans, animals, objects, and sometimes even plants (6).

In a similar manner, Gosse relates the living conditions of the Afro Americans on the farm where

he is residing. He provides a brief description of the houses in which they live, and about the small children and infants being left in the care of children slightly older, “stark naked, from a few weeks old to six or seven years” when they are made to work. Gosse writes, “The pigs and fowls entertain very little respect for the negro children, with whom there is a perpetual squabbling...,” equating the children and their behavior hierarchically with the farm animals and the behavior of the animals (134).

In natural history writing, Afro Americans are often portrayed as having a deeper connection with nature than white Anglo-Europeans. When describing the Cypress tree, Gosse writes, “The negroes collect from its bark a resin of a red hue and pleasant fragrance; which they apply to wounds with some success...” (203). This passage demonstrates a knowledge of a specialized natural medicine application singular to Afro Americans. In another passage, Gosse recounts what he calls “a very interesting operation” where he witnessed the harvesting of honey and the capturing of a swarm of wild bees. Gosse writes that negro men “skillfully” chopped down a tall long leaf pine, lit a fire to smoke the bees while simultaneously harvesting the honey through an elaborate process of involving rubbing the gum of the tree with salt and peach leaves, which the bees supposedly find attractive. They were in this manner able to avoid being stung almost entirely, despite being nearly naked (148-149). These types of examples demonstrate knowledge of the natural world through learned experiences, and at times the methods are quite sophisticated.

Historian Susan Scott Parrish argues that Native Americans and Afro Americans participated in the practice of natural history and held a specific role in the creation and circulation of knowledge. Parrish writes that these groups of people:

...seemed both closer to nature and hence most able to know nature’s hidden processes,

but they also operated within a magical worldview that elite colonials and Londoners disavowed. Indians and Africans collected specimens, testified about topography, the migrational patterns of birds, ways of planting tropical crops, methods of inoculation, and, most of all, the healing and poisonous properties of plants. Certain types of facts, if they did not originate with an African or an Indian, had no credibility (18).

Although such a command of nature lends ethos to groups of marginalized people and proves their often-overlooked contributions to the creation of knowledge, in a time when superstition and wonder were still frequently confused with science of the natural world, this also contributed to fear of Afro Americans and Native Americans potentially working with the environment to subsume the Anglo European colonists who already feared creolization.

Gosse was not the only naturalist at this time whose writing on race is perplexing. Another example that has astonished readers can be found in Thomas Jefferson's *Notes on the State of Virginia*. Scholars in the fields of rhetoric and literary criticism have often focused their research around assessing Jefferson's writing as part of the belle lettres genre and as literature of place. Jefferson uses a framework established by Linnaeus and Buffon as his method for identifying and cataloging the natural world that he writes about in *Notes*. As Pamela Regis and Chiara Cillerai argue, when assessing the rhetoric of natural history, Michael Foucault's demonstration of the Linnaean system as process for understanding the natural world lends a great deal of insight into how the Linnaean system ultimately became its own language and how it was able to shape the thinking of Eighteenth- and Nineteenth- century naturalists.

As a naturalist, he provides an unusual perspective in his writings on Alabama, what Regis calls "literature of place" by witnessing first-hand the exoticism of the New World, while also maintaining autonomy from the plantation economic culture as a British citizen. Both

natural theologian and natural philosopher, Gosse embodies the intersectionality of science, wonder, and religion, and the overlapping of all three is found frequently in his descriptions of the natural world. He fits into the discourse community as a practitioner of the material practices utilized in the Enlightenment epoch to make science in the spirit of Baconian-influenced empiricism. He greatly contributed to the canon of natural history and science writing through his many publications, of which *Letters from Alabama* is one. Gosse's cohorts utilized the material practices of natural history as an empirical methodology to make sense of humans as another type of "natural production" to be categorized in the manner of plants and animals (Regis xii). Although Gosse does not make this distinct gesture, his writing style on the social practices in the North American South make it clear that he is in some ways separating human races into multilateral categories, possibly categories influenced by ideas of wonder, such as "parahumanity" as suggested by Allewaert.

## Conclusion

The rhetorical analysis of Gosse's *Letters from Alabama* in this chapter concludes Joyce Chaplin's argument that, "the Lower South and... late-Enlightenment ideas or progress still inform our thinking but ... may impede as well as promote societal betterment (VII). Chaplin writes:

Whites embraced, for example, developments offered by science and by new social-scientific views of humanity in their quest to make a stronger economy. They resembled many other groups in the modern era who used science not simply to enlighten individuals and to improve society but also to apologize for forms of exploitation and social control—especially when these justifications were done in racist terms (15).

The relationship between natural history and race is long and complex, shaping the development of race relations in the American southeast and allowing Native Americans and Afro-Americans to develop their own ethos and place in the knowledge construction of natural history as a practice. I have gleaned that natural history writing can provide understanding into the ethics of Eighteenth- and Nineteenth- century naturalists, their application of scientific theories to social theories, and how the ways they write about science has consequences in modern social theory. The empirical methodology established by the Linnaean system created context for naturalists to view the world through a process of grouping individuals by similarities and separating them based on differences. When applied to plants, this system works. When Linnaeus included man in his list of taxonomic terms, he positioned humans to be subjected to the same scrutiny as plants and animals. Regis writes, “The qualities of a particular individual— personality, even sex— are overlooked by the explorer because the method overlooks them. The representations of human beings produced by the method are now called “manners-and-customs” descriptions, after the topics on which they usually focus” (23). This methodology worked to solidify Afro Americans and Native Americans as the “other” and as objects to be studied. The Linnaean system also fixed species in time, without consideration to evolutionary or social developments. This idea also excluded any room for social mobility, or possibilities or hybridity. It is important to emphasize that the rhetoric of natural history in the context of the Linnaean system is nontemporal and does not recognize the history of cultures.

## THESIS CONCLUSION

The learned procedures specific to the natural history discourse community shaped social and political concepts of race and identity. Although explorers and naturalists assigned agency to the recognizable parts of plants and animals through the construction of analogies to what they knew from the Old World, natural history work conducted in the American Southeast during this time is distinctive from scientific work conducted in the European academies owing to an abundance in novel native species, the tropical climate, and socio-economic differences such as plantation society—creating a peculiar ecological identity that requires reckoning in modern society. Iannini writes, “Natural history had long been among the most widely read and penetrating literary forms for what David Brion Davis has called ‘the problem of slavery’ in an age of putative moral, political, and intellectual progress” (11.)

Through the material practices of naming and cataloguing, natural history developed into a language used to process the natural world. During the Seventeenth-and Eighteenth centuries, this genre of “pre-science” writing focused on descriptions of outward appearances, with not much focus on internal workings and characteristics until comparative anatomy, but became the framework and context for the further development of modern biology (Regis 12). The Linnaean system allowed practitioners to systematically categorize and reduce data, creating a greater gap between natural history as a science, and former incorporations of superstition and metaphysics. The material practice of list making and encyclopedic cataloguing have allowed pre-science data collected on natural history to become the antecedent of modern-day biology, adding to the



canon of knowledge that Daston calls a Science of the Archives. Within the context of researching the rhetoric of natural history, and after closely examining natural history as a precursor to biology and the hard sciences, I would argue that Faber's statement summarized in my introduction can be expanded. I am proposing that applications of science, when applied to social theories, have not only "been singularly unsuccessful in solving social problems or providing moral guidance," but have had a detrimental effect that has lasted decades. This is one example to support Latour's argument for the importance of researching how science is made, fact-checking, and developing stronger relationships between the natural world and society. As natural history developed as a practice over the course of a paradigm shift, elements of philosophies of science, wonder, and religion were refined as agency transitioned between humans, God, and nature. The rhetoric of the period has had a lasting effect on audiences in the scientific community and the general public. Understanding these effects and consequences is crucial to understanding why we believe the things we do, and where we see ourselves placed in the world in relation to others and our environments.

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## VITA

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