THE RHETORIC AND SCIENCE OF WILLIAM PALEY’S NATURAL THEOLOGY

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Yet even man’s intelligence must lead us to infer the existence of a mind in the universe.

Cicero, De Natura Deorum

Abstract

In this essay I suggest that William Paley’s Natural Theology was rhetorical work written to appeal to an eighteenth-century British empiricist mindset. I begin by addressing the book’s argument and audience. In particular, I pay close attention to Paley’s adolescent exposure to rhetoric and Natural Theology’s panegyric format. In addition to excavating the work’s cultural context, I go on to explain why Paley’s work appealed to a conservative, polite and economically comfortable audience. I then move on to address how he used the rhetorical practice of inventio to select scientific sources and examples, or commonplaces, intended to play on the heart-strings of his empirically minded readers. To illustrate this aspect of the book’s rhetorical construction, the end of this essay shows that the scientific examples of his theological argument were taken from a wide variety of contemporary physiology, natural philosophy and natural history texts. Contrary to later nineteenth-century assessments of Natural Theology, I emphasise that these books and articles were standard sources for the practicing scientific community of Paley’s generation. Moreover, throughout all of the following sections, I demonstrate that Paley specifically intended to shame atheism and to praise the attributes of God.

I. INTRODUCTION

In their recent book entitled Reconstructing Nature, John H. Brooke and Geoffrey Cantor argue that British natural theology texts were a distinct literary genre that occurred not only during early modernity, but also during the Enlightenment and the early Victorian era. In addition to emphasising the popularity and intellectual foundations of this genre, they aver that one of its defining features was its rhetorical content. Citing examples from a wide range of books, they specifically concentrate on...
linguistic factors, analogy and antithesis. In identifying these rhetorical tools, Brooke and Cantor suggest that the creation and reception of natural theologies were influenced by specific historical contexts. This essay takes this programme one step further by investigating the rhetorical construction and content of the first edition of William Paley’s *Natural Theology* (1802). In doing so, I treat Paley as an eighteenth-century intellectual and refer to books that he read or which were widely circulated during his lifetime.

Although Paley’s credentials as a philosopher and theologian are often emphasised by historians, his familiarity with rhetoric has been generally ignored. This is indeed an oversight because his intellectual biography reveals a lifelong respect for the art of oration. Paley’s father was a schoolmaster who taught Greek and Latin. He was an avid reader of classical verse and he cited Greek and Latin quotations to friends and family. This no doubt had an effect upon Paley. Like most eighteenth-century schoolboys, he was also taught these languages in school and he soon gained a keen respect for classical authors. He entered Cambridge in 1758 and graduated with a bachelor of arts in 1763. In 1765 he entered the award-winning essay for the Batchelor’s Prize in Latin, a contest that was open to recent graduates. His essay title was ‘A Comparison between the Stoic and Epicurean philosophy with respect to the influence of each on the morals of the people’. Authors writing about Paley have rightly treated this essay as a forerunner to the utilitarian moral philosophy that he would later expound in his Cambridge lectures and his *Principles of Moral and Political Philosophy* (1785). However, this essay is also important because it gives a snapshot of Paley’s early knowledge of rhetoric. More specifically, it unmistakably demonstrates his familiarity with Cicero, the Roman philosopher and rhetorician. In addressing the morality of both Stoicism and Epicureanism, Paley upheld and augmented several positions taken from Cicero’s dialogue entitled *De Natura Deorum*.

This connection to Cicero is important because it laid the literary foundation for the argument that Paley would later propound in *Natural Theology*. Moreover, his employment of rhetoric did not stop when he finished writing his prize-winning essay. An analysis of his published sermons indicates that he used it throughout his successful career as an author and preacher. Based on these factors, it should come as no surprise that he was astutely capable of constructing a rhetorical argument when he wrote *Natural Theology*—especially when many of the natural theologies of his time followed a similar approach. This aspect of *Natural Theology* has often been overlooked because Paley’s previous books, especially *A View of the Evidences of Christianity* (1794), were textbook examples of a logical argument. However, as Edmund Paley so plainly points out, his father not only employed
Ciceronian techniques in his writing, he also enjoyed reading ‘Cicero’s Orations’\textsuperscript{8} and other classical authors as a leisure activity: ‘Horace, Virgil and Cicero, were even to the latest of his life his table books, and at a time when he could have no other occasion for them than as books of amusement.’\textsuperscript{9} As we shall soon see, such a sustained interest in rhetoric not only made \textit{Natural Theology} a highly readable work, it formed the very backbone of the book’s argument from design.

\section*{II. ARGUMENT AND AUDIENCE}

\subsection*{A. Historical Background}

Classical rhetoric held that the main aim of an argument was to persuade the audience by appealing to the emotions.\textsuperscript{10} There were three different rhetorical genres: \textit{judicial}, \textit{deliberative} and \textit{epideictic}. Once an orator selected an argument genre, there were five elements that guided the selection of speech material: \textit{inventio, dispositio, elocutio, memoria} and \textit{pronuntiatio}. The speech was then arranged into six parts: \textit{exordium, narratio, partitio, confirmatio, refutatio} and \textit{conclusio}.\textsuperscript{11} The transmission and fate of these categories from classical times to the Enlightenment is a complex story. As demonstrated in the works of Aristotle and Cicero, rhetoric was its own discipline for the Greeks and the Romans. During the Medieval era, rhetoric was simplified and studied as its own individual subject in the \textit{trivium}. The Renaissance’s rediscovery and codification of classical texts reintroduced rhetoric as a linguistic tool to be used by men of letters. By the eighteenth century, classical rhetoric was subsumed under the larger category of \textit{belles lettres}, a subject often studied in university by lawyers and divines. Although the influence of Cicero, Quintillian and the anonymous \textit{Rhetorica ad Herennium} was still felt,\textsuperscript{12} the classical conception of composition was often reduced to the \textit{dispositio} and authors were encouraged to arrange their argument in a fashion that mirrored a logical equation.\textsuperscript{13} This was especially the case in Britain after the publication and subsequent success of Newton’s \textit{Principia}.\textsuperscript{14} This new logical-rhetoric was particularly evinced in textbooks like George Campbell’s \textit{The Philosophy of Rhetoric} (1776), Joseph Priestley’s \textit{Course of Lectures on Oratory and Criticism} (1777) and Hugh Blair’s \textit{Lectures on Rhetoric and Belles Lettres} (1783).

At first glance, it might seem that the Enlightenment’s emphasis upon the use of logic and empirical evidence in public discourse completely nullified the relevance of the art of persuasion as promulgated by classical rhetoric textbooks.\textsuperscript{15} Indeed, rhetoric’s ‘illogical’ appeal to the passions, if heeded, would have disrupted the marriage between polite conversation and the perceived clarity of logical discourse. This overt conception of rhetoric, in
addition to subsequent critiques from intellectuals like Immanuel Kant and Benedetto Croce, often dominates approaches to Enlightenment history. Yet, fortunately for writers like Paley, these perceptions greatly underestimate the influence of eighteenth-century rhetoric. As Vickers argues, the study of rhetoric’s impact upon modernity has been severely impaired by attacks and dismissals that, ironically, are rhetorical in themselves (Plato, Kant and Croce receive specific attention in his works).\textsuperscript{16} Viewing the eighteenth century from a rhetorical perspective often affords unique insights into how books were constructed and how political and religious ideas were communicated.\textsuperscript{17} Such studies demonstrate that, even though the classical divisions of rhetoric did fragment,\textsuperscript{18} the emphasis upon emotional appeal and the use of linguistic tools of persuasion still remained. These two elements essentially allowed rhetoric to be re-envisioned within a pseudo-logical framework that was clothed with Newtonian empiricism.\textsuperscript{19} In a most ironic turn of events, feelings of goodness (ethos) were aroused by using non-sentimental descriptions of empirical data and feelings of hate (pathos) were aroused by referring to illogical reasoning and unsubstantiated data.

*Natural Theology* was a successful product of this type of rhetoric. It follows the praise and blame format of a classical epideictic, or panegyric, argument. Examples of design are praised and the disbelieving atheist is blamed for an inability to see the divine manifestations of nature: ‘This is Atheism: for every indication of contrivance, every manifestation of design, which existed in the watch, exists in the works of nature; with the difference, on the side of nature, of being greater and more, and that in a degree which exceeds computation.’\textsuperscript{20} This teleological panegyric is further supplemented, especially at the end of the book, when Paley praises God, the divine designer, for his ‘Omnipotence, omniscience, omnipresence, eternity, self-existence, necessary existence, spirituality.’\textsuperscript{21} Because of the emotional efficacy of references to the Sublime at the end of the eighteenth century,\textsuperscript{22} Paley knew such a divine panegyric was the strongest part of his argument and accordingly placed it at the end. By praising the design of nature and by shaming the ignorance that he skilfully attaches to atheism, Paley was able to make the ‘Atheist’ the prime antagonist. As Brooke and Cantor have shown, the atheist is an imaginary interlocutor in many natural theologies of the period.\textsuperscript{23} The main weapon Paley used in this process was the *ethos* (calming emotions) generated by empirical data in the later eighteenth century. In so doing, he is specifically appealed to the *captatto benevolentiae*, or good will, of his audience.\textsuperscript{24} In general, the emotional appeal necessitated by such an approach did not cause him much consternation and it was even appreciated by his audience. For instance, after he gave a 1790 sermon entitled ‘The Use of Propriety of Local and Occasional Preaching’, a subsequent review placed
Paley’s emotive methods on par with those used by Methodist ministers: ‘[T]he method itself is not to be blamed, and under the correction of sounder judgement it might be rendered beneficial.’

B. Audience

To render such emotional appeals ‘beneficial’ Paley had to know his audience. Paley’s readers were politically conservative (both Tory and Whig), polite and already predisposed to Newtonian natural theology. They were economically secure, as only the nobility and the gentry could afford to buy the first edition. Within this context, the rule of politeness within social discourse was supreme and this is why Paley frequently references polite men of letters such as Addison and Goldsmith. As Langford has argued: ‘Politeness conveyed upper-class gentility, enlightenment and socialbility to a much wider elite whose only qualification was money, but who were glad to spend it on acquiring the status of gentleman.’ Politeness was associated with rhetoric in many ways, especially in the ability to insert well-placed and interesting commonplaces into a conversation. The discovery of such examples forged strong links between rhetoric, education, scientific instruments and the ever-popular ‘continental’ tour. The polite conversation pursued in the libraries and coffee-houses by these men and women generally frowned upon theories and hypothetical conjecture. Following the lead of the great British philosophers like Bacon, Locke and Newton, rational discourse thrived upon empirical data. Paley had lectured on these writers when he was at Cambridge and it should come as no surprise that Meadley, his first biographer, frequently compares him to Locke. In addition to the appeal of Paley’s empiricism, his previous publications had already made his simple and often homely elocutio (usage of language) quaintly familiar to a large percentage of the reading public. He had acquired this style from his Yorkshire childhood and maintained a dedication to plain and unadorned language in most of his works and sermons. One review of his sermons praised his approach: ‘Plainness and Simplicity, so essential in reading the other services of the church, are also to be preferred in the composition, style, and delivery of sermons: ornaments, or even accuracy of language, which cost the writer much trouble, produce small advantage to the hearer.’

An additional factor to remember about Paley’s audience was that Natural Theology was published in 1802—right in the middle of the Napoleonic Wars. It was a common perception amongst the British that one of the main causes of the Revolution in the first place was the improper application of scientific principles. A conservative backlash, both political and religious, occurred in which a scientifically based design argument such as Paley’s soothed the fears of those who stood to lose the most if ‘Old Boney’ successfully crossed the English Channel. This is probably why Paley takes care not to refer to
Paley's interest in the skill of argumentation was a life-long hobby. The fact that he knew his audience allowed him to employ other rhetorical tools when constructing his argument. In addition to his 1765 essay and his experience as a tutor, author and preacher, Paley loved to visit the law courts. While living in their vicinity, he attended hearings in Lancaster, York, Carlisle and Durham. Near the end of his life, he preached an assize sermon in Durham Cathedral and even became a magistrate for Bishop-Wearmouth. Such experiences no doubt influenced Paley's ability to recognise and employ the art of dispositio, that is, the construction and arrangement of a convincing argument. Regarding arrangement, the book review of Natural Theology in the Edinburgh Review asserts: ‘His great merit lies in the clear perception of the strong or the difficult parts of a question, and in the judicious selection and perspicuous arrangement of his arguments.’ In his section on the division of arguments (confirmatio), Hugh Blair, the widely read rhetorician and contemporary of Paley, held that there were two modes of argumentation: analytic and synthetic. In Lectures on Rhetoric, he states that, ‘The Analytic is, when the Orator conceals his intention concerning the point he is to prove, till he has gradually brought his hearers to the designed conclusion.’ He further avers...
that there are few subjects that can successfully use such a method. He goes on
to define a synthetic argument as one in which ‘the point to be proved is fairly
laid down, and one Argument after another is made to bear upon it, till
the hearers be fully convinced’.43 Paley’s teleological argument is clearly a
synthetic one. Thus, when he refers to a ‘proof’, he does not mean a logical
proof, he means a rhetorical one—similar to the conception of a ‘proof in
court of law. Indeed, Robert Chambers recognised Paley’s ability to select
proofs in his highly popular Vestiges of the Natural History of Creation:

It has been one of the most agreeable tasks of modern science to trace the
wonderfully exact adaptations of the organization of animals to the physical
circumstances amidst which they are destined to live . . . It would be tiresome to
present in this place even a selection of the proofs which have been adduced on
this point. The Natural Theology of Paley, and the Bridgewater Treatises, place the
subject in so clear a light, that the general postulate may be taken for granted.44

Although Blair treats the arrangement of analytic and synthetic arguments, he
does not detail their internal structure. It is here that we must turn to Cicero,
an author to whom Blair continually defers and with whom Paley had been
familiar since his adolescence. Cicero’s De Inventione, in addition to offering his
own argument from design, states that there are two types of rhetorical
arguments: deductive and inductive. Each of these arguments presents a series of
premises that then lead to a conclusion. The key difference between the two
is that a deductive conclusion is predetermined by its premises whereas an
inductive conclusion is based on probable outcome. Likewise, rhetorical
induction is dependent on analogy and synthetically presents the audience
with a long chain of related examples that lead to a series of inductive
assents.45 As Cicero states in De Natura Deorum: ‘And if perchance these
arguments separately fail to convince you, nevertheless, in combination their
collective weight will be bound to do so.’46 Paley was quite forthright about
his use of analogy: ‘I know no better method of introducing so large a subject,
than that of comparing a single thing with a single thing; an eye, for example,
with a telescope.’47 Thus, his arrangement continually repeats small arguments
that consist of the same format: a string of analogically based premises followed
by a teleological conclusion.

For fear of distracting his audience’s attention, Paley did not include
elaborate or weak analogies and he followed the Ciceronian dictum of
including only those examples that would strike the senses and that would not
be offensive.48 He also held that each one of his analogies was strong enough
in itself to represent the teleological underpinnings of nature en total. This
allowed him to side-step Humean scepticism with a common-sense appeal to
the impracticality of reductio ad infinitum: ‘Our going back ever so far brings us
no nearer to the least degree of satisfaction upon the subject. Contrivance is still unaccounted for. We still want a Contriver. Such an appeal naturally begged the question. Yet, since this is a rhetorical argument, its success was based on emotional appeal and it therefore could not be charged of petitio principii. If Paley was making an informal logical argument, he would have committed the fallacies of composition, irrelevant appeal to authority, equivocation, post hoc ergo propter hoc, argumentum consensus gentium, and argumentum ad verecundiam. Moreover, a philosophical argument considers all relevant counterexamples—which Paley plainly did not do. The very rhetorical method of his argument exonerated him from such concerns and allowed him to use analogies and examples which were calculated to convince his audience.

III. INVENTIO AND SCIENTIFIC COMMONPLACES

A. Inventio and Commonplaces

The practice of using ‘scientific’ examples was not original to early modern natural theology. For instance, to prosecute the arguments presented in De Natura Deorum, Cicero used ‘the orrery of Posidonius . . . astronomical details, tides, the ether, volcanoes, climate, human diet, the kinship of plant, animal, and human life’. In classical rhetoric, the selection of appropriate examples was closely associated with the initial construction of the argument and was therefore included under the practice of inventio. During the Renaissance, the process of collecting topics (topica), or tables, developed into an elaborate system. These tables were lists of emotive examples that the orator arranged around a common idea for the sake of easy recollection. Each of these examples was called a commonplace and orators were instructed to insert them strategically into an argument. This method of collecting commonplaces permeated many forms of literature and, as Paolo Rossi and Ann Blair argue, the practice of making inventio tables became closely associated with scientific methodology during the Renaissance and early modernity. It particularly influenced natural history books since the sheer amount of data required an author to cull specific examples from nature. The general goal of these works was to arrange natural objects into an intelligible order. Since most of these taxonomies were under-girded by conceptions of divine design, natural theology and natural history became frequent bedfellows—their invention and selection of commonplaces being based on the same method. Because of the overt emotional appeal associated with commonplaces, eighteenth-century textbooks on rhetoric tended to shy away from directly addressing the selection and arrangement of examples. For instance, Hugh Blair briefly outlines the ‘antient Rhetorician’s’ use of topics in his Lectures on Rhetoric and
Belles Lettres. This being said, the selection of topics and/or commonplaces receives lacklustre attention in his work in general. When considering the ‘logical’ rhetoric espoused during the Enlightenment, this should not come as a surprise. But, an author had to arrange his treatise somehow and, as Blair himself notes, strictly logical reasoning makes for a boring and, therefore, unsuccessful rhetorical argument. Thus, it was to Paley’s advantage to create rhetorical commonplaces and tables when preparing to write his book.

In 1825 Edmund Paley published a biography of his father entitled An Account of the Life and Writings of William Paley. This work clearly indicates that Paley used inventio tables sedulously to gather scientific commonplaces for Natural Theology: ‘There are three or four large manuscript books filled with observations and short substantial hints taken from various authors.’ Edmund then lists the scientific sources cited by his father:


Lazzaro Spallanzani, Edward Stevens, John Hunter, John Brinkley, John Law, Roger Cotes, Erasmus Darwin, Bernard Nieuwentyjt and William Withering could also be added to this list. The fact that these sources were well-known names in polite British society demonstrates that Paley clearly intended to include authoritative authors whose reputation would make his argument more emotionally convincing. The names of these authors themselves were effectively ‘testimonies’ to Paley’s standing as a gentleman. To reiterate his solidarity with authors like Ray, Derham and Nieuwentyjt, Paley used several of the scientific commonplaces that these writers had included in their own arguments. Such a use of authoritative sources was practised in classical rhetoric but received renewed acceptance after medicine, law and theology started to professionalise in the seventeenth century. Indeed, one of the self-proclaimed hallmarks of many Philosophical Transactions articles during the early modern period was the citation of authoritative sources. Paley was greatly influenced by this tradition and Edmund’s William Paley tells how his father made one of three different marks beside all the commonplaces that he had culled. There was one mark for those that he could not place in his argument, one for those that were ‘supposed to be of more value’ and another one for those that were finally ‘inserted’ into Natural Theology.

The method by which Paley selected his scientific commonplaces was governed by how well he believed the example would serve the emotional appeal (ethos) of his divine panegyric. Once the commonplaces were chosen,
they were ‘inserted’ into the areas of the argument where they were used analogically and metaphorically to illustrate (mechanical) design: ‘The proof of each example is complete; for when the design of the part, and the conduciveness of its structure to that design is shewn, the mind may set itself at rest.’ Elsewhere he states: ‘We proceed, therefore, to propose certain examples taken out of this [anatomy] class; making choice of such as, amongst those which have come to our knowledge, appear to be the most striking, and the best understood.’ Most of his commonplaces were taken either from well-known scientific authors or from observations based on his own hunting and fishing experiences (these pastimes being further proof of his gentlemanly standing). As such, they were well positioned to play the epistemological heartstrings of Paley’s Enlightenment audience—a point noted in the introduction to an 1825 edition of his collected works:

Though the proofs of the Divine power and wisdom are many, so vast, and so luminous, that they hardly need any explanation, yet there is no one who can peruse the demonstrative evidence which Dr Paley has produced of these attributes, without being more deeply impressed with the sentiment of their presence than he was before.

In the process of using data taken from scientific texts, Paley was communicating (or perhaps popularising) science not only to the genteel audience that read the book while he was alive, but also to middle-class readers who could afford to buy it when technological innovations lowered publication costs after 1815. On the surface, analysing the ‘science’ Paley chose to support his argument might seem a rather simple task. However, as one digs into the five hundred pages that comprise Natural Theology’s first edition, it becomes quite clear that Paley’s rhetoric allowed him to present his scientific examples in an unsystematic manner. This effectively makes Natural Theology one gigantic intellectual jig-saw puzzle of scientific commonplaces. For instance, Paley discusses the anatomy of quadrupeds, insects and humans in several different chapters based on their analogical relevance to his rhetorical argument. He could do this because he held that each individual commonplace proved design and this meant that he did not have to logically relate like examples to like examples. Such a jumble of information means that a front to back reading is not likely to clarify the entire scientific picture presented behind the rhetoric.

B. Anatomy and Physiology

The rhetorical practice of using anatomical commonplaces (both from humans and animals) enjoys a special place in the Western literary tradition. As Cicero notes, ‘that man has been cared for by divine providence will be more readily
understood if we survey the whole structure of man.' In the two centuries that preceded *Natural Theology*, anatomical commonplaces were the basic staple of most physico-theologies. However, even though the concept of using the human body as a panegyric showcase had been around for a while, Paley excelled at selecting examples that impressed his polite British readership. Shortly after *Natural Theology* was published, the *Edinburgh Review* summarised Paley’s science: ‘The physiology, in so far as we are able to judge, is extremely correct throughout; and it was not without surprise that we found the reverend author so accurately and familiarly acquainted with the most recent discoveries in science.’ Like many natural theologians, Paley’s anatomy and physiology commonplaces form the backbone of his teleological argument. He most frequently cites books written by James Keill (1673–1719), William Cheselden (1688–1752), Bernard Nieuwentyjt (1654–1718) and William Derham (1657–1735). All four of these men espoused Newtonian mechanism and were staple authors for Paley’s polite audience. Keill and Cheselden were both established anatomists, their textbooks being used throughout the eighteenth century. Nieuwentyjt and Derham were prominent physico-theologians, their works drawing examples from anatomy and several other areas of natural history and philosophy. The authority these authors gave to Paley’s book would have been substantial. If this were not enough, Paley bolsters his argument by referencing articles from the most recent issues of the *Philosophical Transactions*—the scientific journal of eighteenth-century Britain.

Since the ear and the eye were a favourite topic for both anatomy and physico-theology books during the Enlightenment, Paley discusses these organs at the beginning of his argument. He then goes on to discuss the skeletal, muscular, circulatory and digestive systems. Even though later editions of *Natural Theology* included anatomical illustrations (Dr James Paxton’s 1826 edition for example), Chapter VIII clearly expresses Paley’s desire to make the text descriptive enough in itself. Additionally, Paley is keen on the rhetorical strengths inherent in the analogical method of comparative anatomy because it allowed him to alternate between striking examples taken from both human and animal anatomy: ‘Thus, in comparing the eyes of different kinds of animals, we see, in their resemblances and distinctions, one general plan laid down, and that plan varied with the varying exigencies to which it is to be applied.’ Most often, Paley uses the form and function of various human anatomical features as a starting point and then analogically introduces similar instances from animal anatomy.

Paley focuses much of his discussion of the circulatory system on blood vessels and the heart. In these sections he reduces the placement of blood vessels into an easily grasped metaphor: ‘The disposition of the blood-vessels... is like that of the water-pipes in a city, viz. large and main trunks
branching off by smaller pipes (and these again by branching off by smaller pipes) in every direction, and towards every part in which the fluid, which they convey, can be wanted.’ Although Paley utilises metaphorical language throughout the book, it most frequently occurs in the anatomy sections—often repeating the same metaphors used by his sources. For example, the above pipe example appears in Cheselden, Keill and several other eighteenth-century anatomy textbooks. In addition to drawing from these authorities, Paley cites Abbé Spallanzani, Dr Stevens and Dr Hunter—all recognised experts on peristaltic motion and gastric juices.

C. Natural Philosophy

During Paley’s time, ‘Natural Philosophy’ was generally used to refer to mathematics and planetary astronomy (and sometimes to the empiricist principles that governed the pursuit of scientific inquiry). Paley’s rhetorical usage of natural philosophy commonplaces was, in principle, a more sophisticated extension of the way astronomical proofs were used in classical teleological arguments. For instance, in *De Natura Deorum* Cicero states: ‘Who would not deny the name of human being to a man who, on seeing the regular motions of the heaven and the fixed order of the of the stars . . . can deny that these things possess any rational design . . .?’ During the eighteenth century, Newtonianism (and the natural theology associated with it) was no stranger to rhetorical linguistic tools. Indeed, Humphry Davy’s lectures (later turned into books) on the physical sciences, many of which were delivered at the same time as *Natural Theology*, used rhetoric to make science appealing to a polite audience already predisposed to natural theology. Such a strong connection between rhetoric and natural philosophy allowed Paley to include commonplaces already familiar (and therefore more convincing) to his audience. His astronomy chapter cites only recognisable sources: Roger Cotes (1682–1716), Colin Maclaurin (1698–1746) and John Brinkley (1763–1835). All of these authors were Newtonian mathematicians; in fact, Maclaurin’s 1748 *An Account of Sir Isaac Newton’s Philosophical Discoveries* (which Paley cites) was one of the most esteemed Newtonian textbooks in the eighteenth century. The natural philosophy that Paley drew from such sources was generally known to most eighteenth-century savants. This was especially the case for his clear, but simple, portrayal of the ‘laws’ of motion, attraction and inverse proportion.

Aside from portraying the solar system as law-bound and ordered, Paley used his natural philosophy commonplaces implicitly to conjure the epideictic shame that was so frequently attached to French ‘Atheists’. As it was predominantly French mathematicians who attacked Newton’s conception of
inertia, Paley takes care to explain that gravity is an invisible force that is not inherent to matter itself. Instead, he asserts that matter is ‘controlled or suspended by a superior agent’.\(^87\) Such a position made it clear that he did not agree with Cotes and the ‘many other Newtonians’ who held that attraction was a ‘primordial property of matter’. He did this to avoid the rhetorical shame that was often placed upon the British natural philosophers whose writings had been used by French republicans to justify an anti-theological, yet ‘law’ based, conception of morality. Like the final chapters on God’s attributes, the astronomy chapter’s commonplaces praise the Divine. Paley holds that all forces associated with gravity are superadded to matter by the Deity. He openly admits that he is mystified as to how such divine sustenance occurs. However, the rhetorical power of this divine panergy allows him to introduce additional examples that further shame other theories that attempted to eliminate God’s involvement in planetary astronomy. This can be seen in his inclusion of cometary orbits, perturbing forces and ‘fluids’.

Cometary orbits and perturbing forces created problems for eighteenth-century planetary astronomy because Newton had not offered explicit mathematical formulas that could be used to explain their irregular rotational patterns. These inconsistencies were often used by the French, especially those who supported the Cartesian conception of fluids, to deride Newton’s system. Paley shames the French on this topic, by asserting that comets have different paths that possess a ‘great degree of eccentricity.’ In this matter, they are different from orbits of planets. Yet even in their irregular revolution, they exhibit a law-bound order that regularly took them ‘very near to the sun, and carried away to immense distances from him.’ Regarding perturbation forces, Paley states that they continually change the dimensions of the earth’s ellipse. But the reader can be assured that divine providence allows humanity to endure these ‘Small irregularities’ about which:

> It has been rightly also remarked, that, if the great planets Jupiter and Saturn had moved in lower spheres, their influences would have had much more effect as to disturbing the planetary motions than they now have. While they revolve at so great distances from the rest, they act almost equally on the Sun and on the inferior planets.

Likewise, Paley also uses the ethos generated by Newtonianism to shame the concept of ‘fluids’ (a concept used by the French to attack Newton’s conception of a vacuum) by stating: ‘By calculations drawn from ancient notices of eclipses of the moon, we can prove, that, if such a fluid exist at all, its resistance has had no sensible effect upon the moon’s motion for two thousand five hundred years.’
D. Natural History

Like natural philosophy and physiology, examples from natural history were also used in classical times—although Paley’s insistence upon divine benevolence and acts of individual design are much more characteristic of the Enlightenment’s conception of the natural world in general. Throughout the eighteenth century, natural history was an extremely popular enterprise that was closely linked to the leisure time of polite culture and to the practice of natural theology. Natural history during Paley’s day addressed the ‘Three Kingdoms of Nature’ (animal, vegetable and mineral) and what would now be known as geology, meteorology and oceanography. Not only did some universities have a Chair of Natural History (Edinburgh for example), mineralogy and botany were also taught in most medical schools. Regarding his natural history commonplaces, Paley writes:

We are not writing a natural history; therefore we have not attended to the classes into which the subject of that science are distributed. What we had to observe concerning different species of animals, fell easily, for the most part, within the division which the course of our argument led us to adopt.

Instead of arranging his work along the lines of Linnaeus’ *Systema Naturae* (1735), he loosely arranges it around similar morphological features taken from botany and zoology. These examples were culled from personal observation and from natural history books. Most of Paley’s sources would have been well-known to polite readers and served to give his argument an air of authority since, once again, he cites sources popular in polite culture: John Ray, Oliver Goldsmith (1728–74), William Withering (1741–1799), Erasmus Darwin (1731–1802) and the French Royal Academy (the latter’s volumes being printed in the seventeenth century—well before the French Revolution). Taken as a whole, *Natural Theology* gives informative morphological and anatomical descriptions of quadrupeds, birds, fish, insects, reptiles and plants.

Because of their use in both anatomical and natural history textbooks, Paley was quite fond of discussing quadrupeds. Their anatomical features allowed him to make analogical comparisons between like body parts. Although references to insects and plants occur throughout *Natural Theology*, there are separate chapters devoted to each near the end of the book. Paley’s chapter on insects is packed with natural history commonplaces and his chapter on plants is equally robust. Generally, these types of examples, especially the botanical ones, appealed to polite culture’s interest in horticulture and refer to organisms that could readily be found in a local English garden. Like the commonplaces included by Ray, Derham and Nieuwentjyt, these natural history examples also would have been implicitly associated with eighteenth-century classification systems that held God to be the divine orderer of the
natural world. For instance, Paley explains how a seed ‘knows’ how to grow upward no matter which way it is situated in the earth. Such teleological references also would have appealed to the intellectual conservatism created by the French Revolution at the end of the eighteenth century.

IV. CONCLUSION

This essay addressed several aspects of the rhetoric and science that William Paley used in his *Natural Theology*. The first section established that his work was part of a larger eighteenth-century rhetorical tradition that was closely linked to empirical evidence and logical discourse. As such, it was intended for a polite audience that would accept the *elocutio* that Paley employed to praise design and to shame atheism. This panegyric was arranged into a synthetic argument based upon a series of analogies. The second section detailed how Paley used *inventio* tables to select his scientific commonplaces. The empirical examples of design that formed the emotive base (*ethos*) of his argument were taken from medicine, natural history and natural philosophy. Though Paley does not treat these systematically, his science was sound (being based on either standard or recent sources) and provided an informative introduction to the subjects at hand.

Even though Paley and many other eighteenth-century philosophers continually employed ‘empirical’ rhetoric in their natural theologies, this form of argumentation has received little attention from historians. This is particularly perplexing when one considers the immense popularity enjoyed by natural theology books during the Enlightenment. Similarly, studies that discuss several of Paley’s scientific authorities—William Derham, William Cheselden and Oliver Goldsmith for example—are just as scarce. Such historiographical omissions are particularly curious because these authors were highly influential in their time. Recent work in the history of philosophy demonstrates that asking why such men have been ignored suggests that the current eighteenth-century ‘canon’ of influential intellectuals may not be so canonical. Indeed, Marina Frasca-Spada argues that, ‘time may be ripe for historians of philosophy and historians of the sciences to be more assertive in placing metaphysical and logical issues as well in their own concrete original settings.’

Because of the primacy of empirical reasoning espoused by authors who lived in the eighteenth century, a re-evaluation of the scientific and rhetorical canons along Frasca-Spada’s lines would be quite helpful when studying the historical interaction between present-day academic disciplines. Such studies would be extremely beneficial for understanding authors like Paley who utilised information taken from philosophy, rhetoric, theology and the natural sciences. Such a multifaceted intellectual base allowed his argument to serve as
reference point for both religious and secular writers in the nineteenth century. His scientific commonplace also introduced his readers to various aspects of science under the auspices of literary genre already familiar to them. As such, *Natural Theology* was an eloquent restatement of an argument that they already believed. Perhaps this is why the book enjoyed considerable success during the entire nineteenth century. Its publication figures remained high throughout the century, it was translated into several languages and it was standard reading for ordinands at the universities of Durham, Oxford and Cambridge. Further studies of the natural theology genre would benefit by exploring the tropes, figures and stylistic concerns often associated with the classical conception of *elocutio*. Following Brooke and Cantor, larger works that compare the rhetoric employed by prominent natural theologians like Ray, Nieuwentyt and Derham are also needed. Such studies would not only shed more light on theological representations of nature, but also on the process by which scientific knowledge was popularised to the reading public.

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5 E. Paley, *Account of the Life*, details this argument and how his father used Cicero on pages 49–62.
6 See Brooke and Cantor, *Reconstructing Nature*.


4. ‘Chapter III. Application of the Argument’. Because of the plethora of *Natural Theology* editions available, for the convenience of the reader, I cite the chapter number and name.

5. ‘Chapter XXIV, Of the Natural Attributes of the Deity’. In his analysis of Paley’s argument, Nuovo treats this ‘eulogistic’ from philosophical perspective but fails to associate it with rhetoric. V. Nuovo, ‘Rethinking Paley’, *Synthese* 91 (1992) 41.


Also see Rhetorica ad Herennium, §1.4.6; §1.7.11 and De inv. §1.13.20.


‘Chapter XXIII. Of the Personality of the Deity.’

The process of updating Paley’s science is briefly treated in the preface of Thomas Smibert’s edition (Edinburgh: William and Robert Chambers, 1837).


Meadley, Memoirs, pp. 65, 130.

F. Jeffrey, Art. III, Natural Theology, p. 287.


In the words of Cicero, ‘Induction is a form of argument which leads the person with whom one is arguing to give assent to certain facts to which he has assented’. Cicero, De Inventione, §1.31.51.

De Natura Deorum, §2.65.163.

Both of Paley’s quotations in the paragraph are taken from ‘Chapter III: “Application of the Argument”’. Such blatant admissions make one wonder why Nuovo holds that Paley ‘barely mentions’ the ‘principle of analogy’. Nuovo ‘Rethinking Paley’, p. 36.

Cicero, De Oratore, §3.61.

‘Chapter II. State of the Argument Continued.’

This quotation is taken from Rackham’s ‘Introduction to De Natura Deorum, (1932), p. xvii.

Rhetorica ad Herennium, §1.7.9.


‘Hence their Doctrine of Topics, or ‘Loci Communes’, and ‘Sedes Argumentorum’, which makes so great a figure in the writings of Aristotle, Cicero, and Quintilian. These Topics or Loci, were no other than general ideas applicable to a great many different subjects, which the Orator was directed to consult, in order to find Out materials for his Speech.’ Blair, Lectures on Rhetoric, Vol. II, pp. 399–400.


Ibid., p. 321. Some of the spellings here are different than today’s usage.

Archbishop Whately once noted the similarity between the arguments offered by Nieuwentyt and Paley. R. Whately, Miscellaneous Lectures and Reviews (London: Parker, Son and Bourn, 1861), p. 94.

Moss, Printed Commonplace-Books, p. 258.

Oftentimes, the believability of an author’s testimony came down to whether or not he was an upstanding gentleman. See S. Shapin, Social History of Truth: Civility and Science in Seventeenth-Century England (Chicago: Chicago UP, 1994).

Chapter VI. The Argument Cumulative.’

‘Chapter VIII. Of Mechanical Arrangement in the Human Frame.’

See Edmund Paley’s list in the above paragraph.


De Natura Deorum, §2.54.134. The discussion of the human body continues until §2.58.146.


Keill and Cheselden both leaned toward iatromechanism, the belief that various functions of the body could be reduced to mathematical principles. Keill’s Account of Animal Secretion (1708) particularly demonstrates this proclivity. For this mathematical context of these texts, see T. Frängsmyr, ‘The Mathematical Philosophy’ in T. Frängsmyr, J.L. Heilbron and R.E. Rider (eds), The Quantifying Spirit in the Eighteenth Century (Oxford: California UP, 1990), pp. 27–44.


Paley cites Derham’s Physico-Theology (London: 1696) and Nieuwentyt’s A Religious Philosopher, or the Right Use of Contemplating the Works of Creator, trans. (English) J. Chamberlayne (London: 1718). He also references an article published by ‘Dr Nieuwentyt’ in Leipsic Transactions but gives no date or publication information. See ‘Chapter IX. Of the Muscles’.

Chapter III cites Everard Home’s 1800 Philosophical Transactions article on the ear of an elephant. Paley goes on to nebulously cite ‘another volume of the Transactions above referred to, and of the same year’. This, however, does not stop him from including a six line quotation taken from the unnamed articles.

W. Paley, Natural Theology or Evidences of the Existence and Attributes of the Deity, Collected from the Appearances of Nature by William Paley D.D., Illustrated by a Series of
Plates, and Explanatory Notes, by James Paxton, Member of the Royal College of Surgeons, London (Oxford: J. Vincent, 1826). These anatomical plates were also published as a book of their own: J. Paxton, Illustrations of Paley’s Natural Theology with Descriptive Letter Press (Oxford: J. Vincent, 1826).

`Chapter III. Application of the Argument.'

`Chapter X. Of the Vessels of Animal Bodies.'


De Natura Deorum, § 238.97.

Many studies have addressed this situation. L. Stewart, This Rise of Public Science is a helpful introduction to the topic.


Cotes was a Cambridge mathematician and Plumian Professor of Astronomy and Natural Philosophy. He was also a personal friend of Isaac Newton and helped him publish the second edition of Principia. See the Roger Cotes entry in the DNB.

Paley gratefully acknowledges his debt to John Brinkley with a footnote on the first page of the astronomy chapter. At the time, Brinkley was the Astronomer Royal for Ireland. Paley’s correspondence with him was fostered by Edmund Law (1703–87), the Bishop of Elphin (Ireland) and friend of Paley since his days at Cambridge University.


‘Chapter XXII. Astronomy.’ The following quotes about natural philosophy in the next two paragraphs come from this chapter.

For Cicero’s brief treatment of this area in De Natura Deorum, see § 2.62.155–59.


‘Chapter XIX. Of Insects.’

Paley mainly reference’s Ray’s Wisdom of God (London: 1691), which was still a respectable scientific source on certain topics even a century after his death. The definitive biography of Ray still remains C. Raven, John Roy Naturalist: His Life and Works (Cambridge: Cambridge UP, 1942).

includes several interesting facts about Goldsmith’s view of natural history, especially the introduction that he wrote for Richard Brooke’s *A new and accurate system of natural history, etc.* (London: J. Newbery, 1763).

93 W. Withering, *A Botanical Arrangement of all Vegetables Naturally Growing in Great Britain* (London: 1776), which Paley cites as *Botanical Arrangement*. The third edition’s title was slightly different: *An Arrangement of British Plants: According to the Latest Improvements of the LINNAEN SYSTEM: To which is Prefixed an Easy Introduction to the Study of Botany* (Birmingham: 1796).


96 ‘Chapter XIX. Of Insects’ and ‘Chapter XX. Of Plants.’


98 See Théologie naturelle, ou Preuves de l’existence et des attributs de la divinité, tirées des apparences de la nature, traduction libre de l’anglais d’après William Paley, par Charles Pictet..., (Geneva J.J. Paschoud, 1804); Teologia Naturale... Tradotta nell’idioma Francese in Ginevra, ed ora...nell’ Italiano (Rome, 1808); Teologia Natural... Traducida á la lengua Española por D.J.L. de Villanueva (London, 1825); *Naturliche Theologie/mit Bemerkungen und Zusätzen von Lord Brougham und Sir Charles Bell, Deutsch von Dr H. Hauff* (Stuttgart: 1837).

99 Although Fyfe has challenged the role of *Natural Theology* in Cambridge’s early-nineteenth-century curriculum, it was clearly recommended reading for those wishing to pass their ordination exams during the 1880s. See *Outlines of Theological Study, Compiled and Published with the Approval of the Committee of the Conference upon the Training of Candidates for Holy Orders, 1881–1887* (Cambridge: Deighton Bell, 1887), p. 52; A. Fyfe, ‘The Reception of William Paley’s “Natural Theology” in the University of Cambridge’, *British Journal for the History of Science* 30 (1997) 321–35.