

Berkeley's *Analyst*:
Rigour and Rhetoric

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Abstract of the Dissertation

This thesis argues for a new interpretation of *The Analyst* based on Berkeley's mature theory of meaning and its role in his views on religion and mathematics. I argue that we should read the Body of *The Analyst* as consisting in an *argumentum ad hominem* against 'freethinkers' who alleged that a mathematical/logicist criterion of intelligibility showed significant parts of religion to be unintelligible and irrational. By showing that the same standards (standards inspired by mathematics and logic) demonstrate the logical instability of calculus, he provides a *reductio* argument against this freethinking methodology. The text has typically been read as constituting a significant change in Berkeley's position on the philosophy of mathematics—one involving a newly conciliatory outlook on the foundations and axioms of classical mathematics and an abandonment of the sweeping semantic pragmatism advanced by Euphranor at the end of *Alciphron* and the instrumentalism that defines much of his previous approach to mathematics and science. I argue that this ostensible endorsement of the foundations of traditional mathematics is merely a necessary condition of an internal argument Berkeley wishes to use to demonstrate that the calculus fails its own discipline's tests of rigour. Further, by reading the text as I suggest, we can reconcile the arguments of *The Analyst* with the pragmatic theory of word meaning endorsed in the decisive argument of the final dialogue of *Alciphron*.

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¹ (Hight 2012, 116)

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List of Abbreviations

Works by Berkeley

Alciphron

When citing *Alciphron, or, the Minute Philosopher in Seven Dialogues*, I refer to the 1732 second edition in *Berkeley's Alciphron: English Text and Essays in Interpretation* edited by Brykman, Jaffro and Schwartz. References are to dialogue number and section number (e.g. *Alciphron*, D1 §1).² When referring to the editorial material in the same work I use the authors' details in the citation and give the page number (e.g. Berkeley, Jaffro, et al. 2010, p.11).

The Analyst

When citing from the main text ('the Body') and queries ('the Queries') of *The Analyst*, I refer to the edition in Luce and Jessop's *The Works of George Berkeley Volume IV*. When citing the synoptic contents (not included in Luce and Jessop) or Douglas Jesseph's editorial commentary, I refer to Jesseph's *De Motu and The Analyst: A Modern Edition, with Introductions and Commentary* and give the page number. References to sections of the Body are given by Section number, references to Queries by Query number (e.g. Q46).

Arithmetica

When citing Berkeley's *Arithmetica*, I refer to the translated version ('Arithmetic demonstrated without Euclid or Algebra') by G N Wright (1843), which is reproduced in Sampson's *Works of George Berkeley Volume 1* (1897).

De Motu

When citing *De Motu*, I refer to the version in *The Works of George Berkeley Volume IV*. References are to section number.

² I share Brykman and Jaffro's preference for this 1732 second edition, over the 1752 edition favoured by Luce and Jessop in *The Works of George Berkeley, Bishop of Cloyne*, and David Berman in *Alciphron in Focus*. See their 'Preface' (Berkeley, Jaffro, Brykman, & Schwartz, p. 9).

<i>DFM</i>	When citing <i>A Defence of Freethinking in Mathematics</i> , I refer to the version in <i>The Works of George Berkeley Volume IV</i> . References are to section number.
<i>Dialogues</i>	When citing <i>Berkeley's Three Dialogues between Hylas and Philonous</i> , I refer to <i>The Works of George Berkeley Volume II</i> (Jessop, 1949). References are to page number.
<i>Guardian</i>	When citing the articles Berkeley published in Richard Steele's <i>Guardian</i> , I refer to the versions published in <i>The Works of George Berkeley Volume III</i> (Fraser, 1871) and give the page number(s) of the quoted excerpt.
Hight	When citing Berkeley's correspondence, I refer to Marc E Hight's <i>Correspondence of George Berkeley</i> (2012), and give the page number(s) of the quoted excerpt.
<i>MI</i>	When working from the document now known in the scholarship as the 'Manuscript Introduction' I use Belfrage's <i>George Berkeley's Manuscript Introduction</i> (1987).
<i>MIM</i>	When citing Berkeley's <i>Discourse addressed to Magistrates and Men in Authority</i> , I refer to the 1738 edition published in Sampson's <i>Works of George Berkeley Volume 3</i> (1898).
<i>Miscellanea</i>	When citing Berkeley's <i>Miscellanea Mathematica</i> , I refer to the translated version ('Mathematical Miscellanies') by G N Wright (1843), which is reproduced in Sampson's <i>Works of George Berkeley Volume 1</i> (1897).
<i>N111</i>	When citing Berkeley's notebooks, I refer to 'the notebooks' (formerly and elsewhere known as <i>The Commonplace Book</i> or <i>The Philosophical Commentaries</i>) and cite from the edition in <i>Berkeley: Philosophical Works including the works on vision</i> (1975), edited by Michael Ayers. References are to entry number (e.g. N111).
<i>NTV</i>	When citing Berkeley's <i>Essay towards a New Theory of Vision I</i> , I refer to the 1732 version in <i>The Works of George Berkeley Volume I</i> . References are to Section number.

'Of Infinites'	When citing Berkeley's essay 'Of Infinites', I refer to the manuscript reproduced in Luce and Jessop's <i>Works of George Berkeley Volume IV</i> .
<i>Principles</i>	When citing Berkeley's <i>A Treatise Concerning the Principles of Human Knowledge</i> , I refer to the version in <i>The Works of George Berkeley Volume II</i> (Jessop, 1949). References are to section number. I note differences between the 1710 and 1734 editions where relevant.
<i>Principles Introduction</i>	When citing Berkeley's <i>Principles Introduction</i> , I refer to the version in <i>The Works of George Berkeley Volume II</i> (Jessop, 1949). References are to section number.
<i>The Queries</i>	When citing Berkeley's <i>Querist</i> , I refer to the version in <i>The Works of George Berkeley, D. D., Bishop of Cloyne Volume III</i> (Berkeley & Sampson, 1898). The text is of the revised issue published in 1750. When referring to the 1735 edition, I refer to the version provided in the appendices of the same text. References are to query number (e.g. Q111) and references to queries removed from 1750 edition are marked with an asterisk (e.g. Q112*)
<i>RNR</i>	When citing <i>Reasons for not replying to Mr Walton's "Full Answer"...</i> I refer to the version in <i>The Works of George Berkeley Volume IV</i> . References are to section number.
<i>Ruin GB</i>	When citing 'An essay towards preventing the Ruin of Great Britain', I refer to the version in <i>The Works of George Berkeley Volume VI, edited by Jessop</i> (1953).
<i>Siris</i>	When citing <i>Siris</i> , I refer to the edition in Luce and Jessop's <i>The Works of George Berkeley Volume V</i> , edited by Luce and Jessop (1964).
<i>SIS</i>	When citing 'A Sermon preached before the Incorporated Society for the Propagation of the Gospel in Foreign Parts', I refer to the version in <i>The Works of George Berkeley Volume III</i> (Fraser, 1871).
<i>TVV</i>	When citing <i>The Theory of Vision Vindicated and Explained</i> , I refer to the version in <i>Berkeley Philosophical Works including the works on Vision</i> , edited by Michael Ayers.

WTW

When citing *A Word to the Wise*, I refer to the 1749 edition published in Sampson's *Works of George Berkeley Volume 3* (1898).

Works by Others

Essay

When citing Locke's *Essay Concerning Human Understanding*, I refer to the Clarendon Scholarly version edited by Nidditch in 1975. Citations are indexed to Book, Chapter and Section (e.g. Locke, 1975, VI xii §2).

Life of Berkeley

When citing A.A. Luce's *The Life of George Berkeley*, I refer to the 1949 edition and give the page number.

CP

When citing from Peirce's collected works, I refer to the 1958 Harvard UP edition, giving the number assigned by the CP system (e.g. CP5.122).

General Introduction

Consider the following puzzle: in 1732, Berkeley published *Alciphron*, and with it a sweeping pragmatic vindication of concepts whose terms fail to represent clear ideas. In that pragmatic semantics, he uses mathematical terms as a model example, maintaining that they represent a case where searching for ideas represented, instead of focusing on the functional and instrumental role played, is mistaken and ‘sure to embarrass’ (*Alciphron*, D7 §18) those who take this analytical approach. ‘Infinitesimals’ are among the examples he chooses as relevant examples for this treatment, which should surprise those familiar with his earlier philosophy. Moreover, it is clear that he sees this understanding of meaning as vital to rescuing certain religious and scientific concepts from accusations of obscurity. Just two years later, Berkeley publishes *The Analyst*, containing a thoroughgoing and scathing attack on calculus, despite its acknowledged utility and fruitfulness. Further, the criticism focuses on the incoherence of infinitesimals, and often on the very grounds he rejected as illegitimate critical in exactly such cases two years earlier. Moreover, in *The Analyst*, Berkeley seems to have a newfound appreciation for the general laudableness of mathematics in a way that, again, should strike those familiar with his earlier work as peculiar.

There are various interpretive options to address the puzzle: perhaps, Berkeley was just inconsistent, and in his desire to criticise certain calculus enthusiasts, didn’t worry about the clash it posed with his earlier theory of meaning; or, perhaps he just changed his mind, and saw that the pragmatic account was inconsistent with criticisms he thought important, and more, he really had come to respect the foundations of classical mathematics; or, perhaps he moved from a general account of semantics to a mixed one where utility can rescue meaningfulness in certain restricted kinds of language use, but not in others. In this thesis, I offer my preferred solution. It is one that requires detailed attention to a number of features of Berkeley’s philosophy and context.

This dissertation offers a novel interpretation of *The Analyst* based on Berkeley’s mature theory of meaning and its role in his views on religion and

mathematics. I argue that we should read the main text of *The Analyst* as consisting in an *argumentum ad hominem*³ against ‘freethinkers’ who alleged that a mathematical/logicist criterion of intelligibility showed significant parts of religion to be unintelligible and irrational.⁴ By showing that the same standards (standards inspired by mathematics and logic) demonstrate the irrationality of calculus, he provides a *reductio* argument against this freethinking methodology. The text has typically been read as constituting a significant change in Berkeley’s position on the philosophy of mathematics—one involving a newly conciliatory outlook on the foundations and axioms of classical mathematics and an abandonment of the sweeping semantic pragmatism advanced by Euphranor at the end of *Alciphron*.⁵ I argue that this ostensible endorsement of the foundations of traditional mathematics is merely a necessary condition of an internal argument Berkeley wishes to use to demonstrate that the calculus fails its own discipline’s tests of rigour. Further, by reading the text as I suggest, we can reconcile the arguments of *The Analyst* with the pragmatic theory of word meaning endorsed in the decisive argument of the final dialogue of *Alciphron*.

The Analyst is a complex work, the understanding of which requires the integration of three strands of Berkeleyan philosophy. At the forefront of his 1730s philosophy is a deep, almost neurotic concern with the future of Anglican morality and the future of western European society. This anxiety is visible in *Alciphron* and *The Analyst*, but perhaps even more pronounced in his social and homiletic writings in the surrounding period—*SIS*, *MIM* and *WTW*—and his personal correspondences.

³ Berkeley used this longer Latin phrasing (e.g. *DFM* §3, §50). Henceforth, I will refer to ‘ad hominem’ or ‘ad hominem arguments’ without italics.

⁴ In my second chapter, I give a detailed account of how we should understand Berkeley’s use of the term ‘freethinker’. A very brief anticipation would appeal to attributes such as deism, atheism, reformism, libertinism—notably, a number of the attributes suggested as associated with leading figures of the ‘Radical Enlightenment’ in the work of (e.g.) Jacob (1976) (2003), Israel (2010) and Wigelsworth (2009). Primary figures occupying Berkeley’s attention were Lord Shaftesbury (Anthony Ashley Cooper, 3rd Earl of Shaftesbury), Bernard Mandeville, Anthony Collins, John Toland, Francis Hutcheson and Matthew Tindal.

⁵ Very briefly, Berkeley’s pragmatism is one according to which a word can have meaning in virtue of its success in application or on the basis of the role it plays in its system, and, even though it does not and could not represent a clear idea in the mind of language users. For relevant discussions, see Berman (Berman D. , *Cognitive Theology and Emotive Mysteries in Berkeley's "Alciphron"* , 1981), Flew (2013), Friedman (2003), and James (1978) (1997).

This anxiety prioritises a pragmatist approach to meaning that Berkeley sees as essential to the vindication of elements of traditional religion. Though this philosophical outlook becomes prior for Berkeley, it exists alongside many of his older, familiar gripes about failures in mathematical theory and practice—particularly those concerning abstraction and the proper object of geometry.⁶ However, this pragmatism, heightened as it is in the works of the 1730s, exerts pressure on the more straightforwardly empiricist picture available in the work of 1709-1713.

Also present is an *ad hominem* about the danger of the rationalistic standard of intelligibility he sees utilised by certain deists and scientists. The same standard that Berkeley believes capable of destroying traditional religion can be shown to be similarly deleterious to disciplines thought to be defined by their rigour—disciplines from which these standards are supposed to derive. This is the intention of the calculus criticism: to provide a kind of *reductio* against freethinking methodology. Thus, the calculus criticism is a misleading guide to Berkeley's own mathematical views at that point, since it is conducted from the position of the freethinker, whose philosophy he opposed relentlessly over the previous twenty years.

This thesis provides an account of the evolution of Berkeley's thinking about language and meaning, and their role in philosophy, taking the development of his views on mathematics as a marker of his philosophical development. I claim that *The Analyst* is impossible to understand without appeal to *Alciphron*. The mature philosophy espoused in the latter text shows that Berkeley underwent an evolution with respect to his philosophical strategy. Though his ends remain fixed, his sense of the means by which to achieve them has changed (a socially oriented philosophy focusing on the well-being of society has replaced the metaphysics-focused approach of the *Principles*). Further, the empiricist metaphysics and epistemology that define the early work are considerably relegated in importance in the work of the 1730, before they are in some aspects recanted in *Siris*. This evolution makes

⁶ For Berkeley's views on the object of geometry, see the notebooks (many of the relevant passages are highlighted in Chapter 3), the *NTV* (1709, especially §124, §149, §160), and the *Principles* (1710).

the standard reading of *The Analyst* look misguided, in that it is irreconcilable with elements that are vital to the objectives of his positive philosophy in *Alciphron*.⁷

In Chapter 1, I chart the progression of Berkeley's early views on language and meaning. I argue that the radical transformation between the views of the notebooks he kept at Trinity College Dublin (c. 1707-1708) (in which he not only endorsed Locke's 'idea theory of meaning', but twice listed it as a principal axiom of his forthcoming system), and the more moderate pluralism of the *Principles* (1710) has a deeply formative influence on the development of his philosophy. I assess his less-discussed influences in this domain and examine his relationship with Locke's *Essay*. I argue that, even in the very early work, some of Berkeley's most independent and original thinking centres on issues of meaning and language, most notably the divine language account of visual perception and the rejection of abstract ideas. In his later work, his anticipation of Wittgensteinian and American pragmatist approaches to language continues this trend for linguistic ingenuity.⁸ I claim that Berkeley's suspicion of language and its capacity to philosophically corrupt is distinctive, even in a period significantly marked by anxieties about language. This linguistic analysis is crucial to understanding Berkeley's sustained engagement with the constraints of meaning, and his arrival at the semantic and broader philosophical pragmatism that defines his mature position.

In Chapter 2, I assess the philosophy of *Alciphron*. Beginning by looking at Berkeley's initial attacks on the freethinkers (in Steele's *Guardian*), I analyse his notion of freethinker and contextualise his worries over their increasing influence. I argue that a deep proto-pragmatism pervades *Alciphron*, and that the better known discussion of meaning and use in Dialogue VII follows very naturally from the earlier debates in the book. Eschewing philosophy characterisable as "barren speculation" is a constant theme. It is clear from *Alciphron* that, where epistemology and metaphysics once took precedence, Berkeley's later primary concerns were religion, society and public morality. This represents a markedly public turn in his philosophy. This turn is further evidenced by Berkeley's

⁷ Examples of the standard reading are found in Jesseph (1990), (2010), (1992), (1993), Sherry (1987), and Katz and Sherry (2013).

⁸ See Flew (2013) for discussion of this view.

subsequent philosophical output, as I discuss. I emphasise the great flexibility of Berkeley's pen and the variability of his writing style. Berkeley writes philosophy in a style typical of his period, but also variously in dialogue form (*Alciphron* and *Dialogues* are quite different kinds of work within this broader genre), satirical articles (*Guardian*), homiletic sermons, works of a more scientific style and content (arguably, *NTV* and *De Motu* are as much psychology and physics as they are philosophy), and sets of queries. This variability in his writing means we should be cautious over any assumption that Berkeley is always sincerely avowing his own philosophical outlook, especially given his ties to Pope, Swift and engagement with the satirical culture of the time.

In Chapter 3, I show the depth of Berkeley's early animosity towards pure mathematics, particularly the special esteem afforded to mathematicians as supremely adept reasoners. I analyse the different elements of his anti-mathematicism, concentrating on the tensions between his idealism and many of the basic elements of the Euclidean system, and, his preoccupation with infinite divisibility. Using one of John Keill's proofs of the infinite divisibility of geometric extension (and Keill's extrapolation of this result as decisive in the matter of extension *simpliciter*), I argue that Berkeley sees misunderstandings about the limitations of mathematical results as detrimental to his own metaphysical projects. This account is fundamental to understanding why, despite Berkeley's avowed pragmatism, he still feels compelled (in the Queries) to weigh in on the factors he sees as ultimately responsible for the difficulties in the foundations of mathematics. Even in the late work, Berkeley still thinks the metaphysics of typical mathematics is mistaken on a number of points, and that this means there will always be difficulties in deriving consistent results. In the end, the success in application of calculus should justify the mathematical results (*Alciphron* commits Berkeley to this), but if one is looking to understand the root of the irregularities in the consistency of the foundations, they should be scrutinising the metaphysical assumptions made by mathematicians (as Berkeley does in the Queries).

In Chapter 4, I provide my critical account of *The Analyst*. I work through the text of the Body, emphasising the correspondences to freethinking criticisms of religion, and the tensions with the position outlined in *Alciphron*. I highlight the

differences between the outlook of the *Body* and *Queries*, focusing on three points of tension: anti-mathematicism, the proper objects of geometry, and infinite divisibility. I argue that Berkeley's inheritances from previous calculus criticism are often underestimated, and point to Nieuwentyt in particular (whom Berkeley read and wrote about in works as early as 'Of Infinities' (c. 1708) and as late as *Siris* (1744)) as a forebear of *The Analyst* criticism. Overall, I suggest that Berkeley would have understood the *Body* of the work differently from the way it is now read. It is typically interpreted as a straightforward guide to a revised philosophy of mathematics, reflecting a change in Berkeley's attitude to classical mathematics. I argue that we should read it as he entreats us to—as a series of arguments conducted from the position of (and 'taking the privilege of') his freethinking ideological opponents. This gives the content of the *Body* of *The Analyst* a hypothetical and internal character of the form 'if you are committed to a certain set of methodological constraints on intelligibility (rationalism, scientism, the idea theory of meaning), then you should see they entail the inadequacy of both infinitesimal and fluxionary calculus'. That we know Berkeley is not committed to those constraints should make us extremely cautious in interpreting the *Body* literally.

In Chapter 5, I offer an interpretation of the ad hominem arguments of *The Analyst*.⁹ I give a detailed account of the role of ad hominem argument in early modern philosophy, emphasising the pervasiveness of the argument form. I maintain that this is a symptom of a much more holistic approach to philosophy, whereby one's failure to 'live' their philosophy is seen as an indication of its insincerity. Further, I contend that Berkeley recognised this standard and exploited

⁹ Much of this work is inspired by Geoffrey Cantor's paper 'The Analyst Revisited' (1984) in which he provides the first scholarly account of what it means to say that Berkeley had ad hominem intentions in writing *The Analyst*. Another noteworthy influence has been Jasper Reid's paper 'Faith, Fluxions and Impossible Numbers in Berkeley's Writings in the Early 1730s' (Reid J. , 2002). My project expands on both by arguing that *The Analyst* is primarily an ad hominem project and that this difference of interpretation has considerable consequences for the nature of the claims made in the text. I am grateful to Cantor for meeting with me and for numerous helpful email exchanges, and for Reid's supervisory help.

it in his use of ad hominem argument. I utilise components of informal logic to characterise two versions of the ad hominem argument provided in *The Analyst*.

In the conclusion, I outline the consequences of my reading for the interpretation of Berkeley's philosophy of mathematics. I suggest that ignoring Berkeley's primarily rhetorical intentions—or failing to take seriously their implications for the status of his claims—has led to a distorted picture of his mature position on mathematics. Instead of reading the work as an argument against freethinking methodology, most commentators read it as a sincere criticism of calculus on the grounds that its foundational entities are logically incoherent—an incoherence Berkeley forgives explicitly and unequivocally on pragmatic grounds in *Alciphron* two years earlier.

Chapter 1: Berkeley's Early Views on Language and Meaning

1.1

Introduction

The most striking feature of Berkeley's views on language and meaning is the acceptance of sense experience as semiotically significant insofar as its components are the significant products of divine intentional content.¹⁰ He uses this view of experience (as intelligent output) as the grounds for an abductive proof of God's existence that aligns the likelihood of existence of a divine intelligence with that of the existence of other minds.¹¹ Just as the best explanation for the seemingly meaningful verbal output of other people is that they have minds that work more or less like our own minds, Berkeley believes that the best explanation for the coherence of the information given in (among others, but *particularly* visual) experience is the existence of a divine intelligence. Thus, Berkeley's position on which components of experience can be said to have *meaning* is dramatically broad.¹²

¹⁰ His original discussion of experience as an instance of divine communication takes place in the *Essay Towards a New Theory of Vision* (1709). At that time he was only (publically) committed to the immaterialism of the objects of visual experience. Though almost all of the content of *NTV* (barring one explicit reference to the independent reality of the objects of touch) is consistent with his eventual global immaterialism, he only discusses it in the context of vision in *NTV*. I discuss this in more detail in the section of this chapter specifically dealing with the text, but want to flag at this point that I recognise that saying either 'sensible experience' or even just 'visual experience' would be a bit presumptive given the textual version of things.

³ This argument is anticipated in §147 of *NTV* and given explicitly in Dialogue 4 of *Alciphron*. For discussion see Kline (1987).

⁴ In Pearce (2017), a solution to certain structural problems in Berkeley's philosophy is offered via linguistic means. 'According to Berkeley, the perceived world is itself a language – or, rather, a discourse in a language. Berkeley intends this claim quite literally. It is the linguistic structure of the perceived world that our thought and speech about co-instantiation, physical causation, and other structural concepts aims to capture. In this way, I argue, Berkeley succeeds in preserving the common sense and scientific structure of the perceived world'. (Pearce K. L., 2017, p. 3)

Berkeley also had pronounced views on the kind of meaning that is more traditionally the purview of philosophy of language—word meaning.¹³ The mature account of language and word meaning that emerges in its most fully developed form in the seventh dialogue of *Alciphron* allows Berkeley to accommodate the semantically challenging aspects of terms that feature in talk of religious mysteries. In providing an alternative to the prevalent *idea theory of meaning*,¹⁴ Berkeley made space for meaningful discussion of entities whose definitions made them impossible to account for within an idea-theoretic framework. In this chapter I provide an account of Berkeley’s fascination with language and meaning and give a history of his transformation from a Lockean idea-theorist in the notebooks¹⁵ to the proto-pragmatist of *Alciphron*. I discuss some of the formative influences in his thinking on language and meaning, and some of the components of his context that animated him and his contemporaries about linguistic issues.

⁵ For Berkeley on word meaning see discussions in Belfrage (1985), (1986), Pritchard (2012), Williford and Jakapi (2009), and Pearce (2017). For philosophy of language in the early modern period, see Aarsleff (1982), Nuchelmans (1983) and Dawson (2007).

¹⁴ I use ‘idea theory of meaning’, or ‘idea theory’ to refer to the fairly prevalent early modern theory that all words stand for ideas. Berkeley refers to the theory in his explanation of how the problematic Doctrine of Abstraction came about: ‘[I]t is a received opinion, that language has no other end but the communicating of our ideas, and that every significant name stands for an idea’ (*Principles Introduction*, §19). Associated with the ‘idea theory of meaning’ is the Lockean view of knowledge according to which knowledge is the perception of the agreement or disagreement of ideas. For further discussion of the idea theory of meaning see Pearce (2017), Yolton (1956), Lowe (2016), and Locke (1975). The extensive discussion in Pearce (2017) addresses what he terms ‘The Theory of Meanings’, which is a somewhat broader approach to meaning, capturing many more potential historical influences than previous discussions. I return to his analysis later in the chapter.

¹⁵ I follow Robert McKim in referring to the notebooks kept by Berkeley at Trinity College Dublin as ‘notebooks’, and follow his reasoning in doing so: ‘Berkeley’s notebooks have been known variously as the *Commonplace Book* – which is short for the *Commonplace Book of Occasional Metaphysical Thoughts*, the name given by A.C. Fraser, who published the first edition of the notebooks in 1871 – and the *Philosophical Commentaries*. Fraser’s title suggests that the notebooks contain random thoughts jotted down whenever it was convenient. Luce thought “Philosophical Commentaries” to be superior because he took the entries to be comments on earlier immaterialist writings he believed Berkeley had written. No earlier immaterialist writings have come to light, and we lack any clear indication that they ever existed. I take the absence of any clear references to it in the notebooks to be strong evidence against its existence; thus I shall henceforth use the neutral title “notebooks.” (McKim, 2005) My references to the notebooks are to the version in Michael Ayers’ edition of Berkeley’s *Philosophical Works* (Berkeley & Ayers, 1996).

I will argue that *Alciphron* represents a considerably more nuanced and comprehensive view of language and meaning than that already interesting and independent position we find set out previously (in the *Principles Introduction*—hereafter ‘*PI*’— and the previous work). This view of meaning is the first plank of a more explicitly pragmatist later philosophy.

1.2

Early Thoughts on Language and Meaning

Educational Influences

Berkeley’s education at Trinity College Dublin (hereafter ‘Trinity’) took place in the early 1700s. It is difficult to get an accurate picture of the precise content of Berkeley’s undergraduate education. The second chapter of Luce’s *Life of George Berkeley* entitled ‘Student Days’ is the longest piece of writing devoted exclusively to that period. It offers a careful study of the available information on Berkeley’s time at Trinity; however, as to containing anything like a concrete curriculum at Trinity at that time, it seems that it was simply too early to expect any real uniformity from tutor to tutor.

Berkeley arrived in Dublin in 1700, at the age of 15. His tutor was Dr Joseph Hall,¹⁶ the Vice-provost of Trinity. Luce describes the university as part of a ‘recovering’ Dublin, regaining calm after the Williamite War (or, Cogadh an Dá Rí). Luce’s first remark on the educational material at Trinity at the time is that ‘Locke’s *Essay*, published in 1690, went on the course almost at once, through the influence

¹⁶ Interestingly, Berkeley thanks Dr Hall especially for encouraging him to think about mathematics in the introduction to his *Arithmetica*: ‘I could not on this occasion, without justly incurring the charge of ingratitude, omit mention of the name of the Rev. John Hall, doctor of divinity, Vice-provost of this college, and the worthy professor of Hebrew. To that excellent man I acknowledge my obligations on many accounts, and not the least, that by his exhortations I was excited to the delightful study of mathematics’ (*Arithmetica*, p. 32).

of William Molyneux, and was ‘working like leaven’ (Luce A. , 1949, p. 31). Many central thinkers with connections to the Dublin intellectual scene endorsed some or most of Locke’s theory: Molyneux, Archbishop William King, Bishop Peter Browne¹⁷ (provost in TCD during Berkeley’s matriculation) and (certainly odd man out in the bunch) John Toland.¹⁸ It is strange to regard Toland as a central or appropriately connected thinker given that *Christianity Not Mysterious*, his best-known book, was burned by order of parliament in 1697. It is stranger still to list Toland as sharing sympathies with Peter Browne, given Browne’s *Letter in answer to a Book entitled Christianity not Mysterious* and its predictably harsh treatment of the former’s work. And yet, he was certainly well known and definitely a man without whom it is difficult to understand that intellectual period in Ireland.

Berkeley studied a broad range of subjects: mathematics, languages,¹⁹ logic and philosophy. Luce reports that the education Berkeley received was distinctly modernist. The suggestion is that TCD’s was a cutting-edge curriculum in many respects²⁰—much more so than the Oxbridge equivalents—and that he participated in the running of a philosophy club that met weekly ‘to discourse on some part of the new philosophy’ (Hoppen, 1970, p. 18). A TCD contemporary of Berkeley’s, writing home, is said by Luce to have described his curriculum as ‘a farrago of conflicting hypotheses drawn from Aristotle, Descartes, Colbert, Epicurus, Gassendi, Malebranche, and Locke, with Plato making little show, and Bacon, Digby, and Boyle absent’ (Luce A. , 1949, p. 39). We know from notebook entry N564 that Berkeley actually had read and absorbed some Bacon, so again, even reports of the curricula of Berkeley’s contemporaries may not prove elucidatory in assessing what Berkeley had or had not read. The dominating influences in the notebooks are Locke and Malebranche by some distance. Their

¹⁷ Luce notes that while Browne was critical of Locke’s theory of reflection, he promoted the study of Locke and “the new way of ideas” (Luce A. , 1949, p. 31) generally.

¹⁸ Toland: ‘But I desire you would remember, that notwithstanding my dissent with Mr Lock about space, I consider his Essay of Human Understanding to be the most useful book towards attaining universal knowledge; as well as for help in men to speak pertinently, intelligibly, and accurately, of all kinds of subjects’ (Toland, 1704, p. 226). Toland’s utilisation of Locke’s philosophy in service of his program of theological reform is a central theme in my fourth chapter.

¹⁹ Berkeley studied Latin, Greek, French and Hebrew.

²⁰ See Berman’s ‘Berkeley and Irish Philosophy’ (2005) for discussion.

combined role in the beginning of his better-known views is apparent from the notebooks: ‘ffrom Malbranch, Locke & my first arguings it cant be proved that extension is not in matter and ffrom Lockes arguings it can’t be prov’d that colours are not in bodies’(N265).

Bacon is a potential influence that has never been seriously considered in Berkeley scholarship. Interestingly, his views on learning are praised in Berkeley’s earliest published works: *Arithmetica* and *Miscellanea*. Berkeley’s admiration for William Molyneux and his collegiate friendship with his son Samuel were significant elements of his early academic life. Molyneux (snr) had been instrumental in making Locke’s *Essay* a feature of Berkeley’s education; his position as parliamentary representative for Dublin University from 1692 until his death facilitated this influence. Molyneux’s regard for Bacon may also have played a role in Berkeley’s early research interests, especially in the latter’s engagement with the Dublin Philosophical Society (established by Molyneux in 1683), a society set up to mirror the championing of Baconian ideas that the Royal Society had undertaken in London. Given the Royal Society’s obvious inheritance from the Baconian ‘new science’ and the aspirations towards the kind of scientific *community* described in *New Atlantis*, it is natural to think that the Dublin Philosophical Society, of which Berkeley was a contributing member, had a similar philosophical spirit.²¹

Berkeley praised Bacon’s mathematical insights in the *Miscellanea*:

Bacon, somewhere, in what he has written concerning the advancement of knowledge, has observed a sort of analogy between the play of hand-ball and mathematics. To wit, as by means of that, besides the pleasure primarily aimed at, we attain other more valuable objects, agility and strength of body, quicksightedness: so mathematical studies, besides their proper aims and uses, have the

²¹ ‘Although no minutes have survived for Samuel Molyneux’s society, a few of the papers read by its members are still extant. (...) Some pieces do however stand out as sentinels of what might have been had the society survived longer than it did. (...) The most interesting paper was however submitted by the society’s most distinguished member, George Berkeley. It is entitled ‘Of Infinities’ and was delivered at a meeting of 1707. Berkeley’s other contribution to the society’s business is a good, accurate, and straightforward description of the famous cave near Dunmore.’ (Hoppen, 1970, p. 196)

collateral one, that they abstract the mind from the senses, sharpen and confirm the talents. (*Miscellanea*, 74)²²

According to this view, the main benefit of mathematics is that it might sharpen your thought in other practices.²³ Significantly, Berkeley also mentions Bacon's views on language in one of his earliest mentions of the problems of abstraction (to general ideas), remarking: 'Doctrine of abstraction of very evil consequence in all the sciences, Mem: Bacon's remark. Entirely owing to language.' (N564) A recurring Baconian theme is that there are a number of forces that psychologically corrupt progress in learning and knowledge. In *The Advancement of Learning* the human mind is imperfect, and, far from being pure and incorruptible is prone to all sorts of problematic dispositions.²⁴ In the *Novum Organum*, Bacon categorises practical problems that make scientific progress difficult in line with four kinds of idols (Idols of the Tribe, Cave, Market Place and Theatre). Analysis of Bacon's description of the idols, suggests that Berkeley was likely thinking of Bacon's discussion of Idols of the Market Place (problems generated by linguistic practice) in his N564 reference.²⁵ The following aphorism is suggestive of this connection:

There are also illusions which seem to arise by agreement and from men's association with each other, which we call idols of the marketplace; we take the name from human exchange and community. Men associate through talk; and words are chosen to suit the understanding of the common people. And thus a poor and unskilful code of words incredibly obstructs the understanding. The

²² Compare *The Advancement of Learning*: 'In the mathematics I can report no deficiency, except it be that men do not sufficiently understand this excellent use of the pure mathematics, in that they do remedy and cure many defects in the wit and faculties intellectual. For if the wit be too dull, they sharpen it; if too wandering, they fix it; if too inherent in the sense, they abstract it. So that as tennis is a game of no use in itself, but of great use in respect it maketh a quick eye and a body ready to put itself into all postures, so in the mathematics that use which is collateral and intervenient is no less worthy than that which is principal and intended.' (Bacon, 2000, p. 82)

²³ This is coupled with a disdain for the intellectual reverence afforded to the pure mathematician, which suggests that Berkeley thought too many people were playing tennis in the middle of a battle.

²⁴ '[T]he mind of man is far from the nature of a clear and equal glass, wherein the beams of things should reflect according to their true incidence, nay, it is like an enchanted glass, full of superstition and imposture.' (Bacon, 2000, p. 109)

²⁵ Stromberg sees verbal worries as a key theme: 'Especially interesting is Bacon on the Market-place, for this is none other than his favourite point about words. Men are the victims of what has been more recently called labelitis; they attach words to things and then are misled by their own categories. It is the fallacy of the catchword, or the unexamined vocabulary.' (Stromberg, 1975, p. 48)

definitions and explanations with which learned men have been accustomed to protect and in some way liberate themselves, do not restore the situation at all. Plainly words do violence to the understanding and confuse everything; and betray men into countless empty disputes and fictions. (Bacon, 2000, p. 42 §XLIII)

This idea—that specialist terminology has, rather than liberating us from semantic confusions, confused us even farther—is alive and well in the *PI*, and it is worth considering Bacon as an influence here. Berkeley's notebooks' mention of Bacon makes explicit reference to abstraction and language. One of the central themes of the *PI* is that a certain kind of meaningless talk (talk of abstract general ideas—obviously an invention of the learned) has led to real problems in the pursuit of understanding. This kind of talk is learned from 'the writings and disputes of philosophers' (*PI* §6) and is protected by its vocabulary and philosophy. The result is that 'most parts of knowledge have been strangely perplexed and darkened by the abuse of words, and general ways of speech wherein they are delivered.' (*PI* §21) Thus, Berkeley takes an idol of the Market Place and shows how one particular instance has completely misdirected philosophical progress.

Thus, far from being absent wholly from Berkeley's TCD experience, there is a case to be made that Bacon had some formative influence on him; particularly, on the issue of the reliability of words to safeguard meaning in philosophical discourse. Rather than seeing anti-abstractionism as a purely negative reaction to Locke, I think it is easy to see it as a positive reaction to and elaboration of Bacon.²⁶ However, of these two possible influences, it does seem clear that the greater was that of Locke, to whom I accordingly now turn.

Locke's Philosophy of Language: 'Of Words'

²⁶ I hope to pursue this line of thought in later work, but am thankful to examiner feedback for forcing me to consider the strength of the existing case.

There has been no shortage of work done on Locke's philosophy of language.²⁷ This is because there is a lot to say; so much, in fact, that the prospect of offering an uncontroversial summary of his central claims is a daunting one. Some of the attention the text has received is due to the fact that Book III of Locke's *Essay* is an early classic of linguistic philosophy, and, according to Kretzmann: 'the first modern treatise devoted specifically to philosophy of language.' (Kretzmann, 1968, p. 175). Relatedly, it may also be seen as an archetypal version of the pre-Fregean system of thinking about language. Frege makes some critical mention of Locke—when, in the *Grundlagen*, Frege criticises pre-existing conceptions of number, Locke's position, that number is a property of objects, is explicitly criticised.²⁸

The literature differs on the correct interpretation of Locke's views on language on a number of issues (both in terms of what Locke actually believed, and the potentially separate issue of what he ought to have believed/what the best version of a Lockean-type theory looks like). Interesting work has been done on Locke's linguistic philosophy, connecting it to more novel work associated with western philosophy's linguistic turn—a period in which meaning and language were transparently at the forefront of contemporary philosophical concern. For example, it has been suggested that there are interesting parallels between the Lockean position outlined in the *Essay* and much more recent notions in semantic theory. It has even been suggested that one can find sensitivity in Locke to something like the sense-reference distinction.²⁹ This research emerges from a series of publications attempting to rescue the respectability of Locke's best-known linguistic claim, that words signify ideas. Ashworth characterises one such attempt (by Kretzmann) as follows:

Kretzmann has identified the main thesis of Locke's semantic theory as the view that words signify ideas, and he wrote that 'it is in [Locke's] presentation of it that this thesis has become established as one of the classic blunders in semantic theory.' (Ashworth, 1981, p. 4)

²⁷ For treatments of Locke's philosophy of language see Ashworth (1981), Kretzmann (1968), Dawson (2007), Landesman (1976), Yolton (1956), and Ayers (1991).

²⁸ (Frege, 1948, pp. 7-8).

²⁹ Examples are Kretzmann (1968) and Yolton (1968).

For the current purposes—of discussing the formative influence Locke’s views on language exerted on Berkeley—it seems prudent to take a fairly traditional stance and stay close to the presentation in Locke’s own work. When reference is made to the more recent literature it will typically be to try to resolve puzzles presented in the primary text.

Locke, it seems, didn’t set out to talk about meaning and language in the *Essay Concerning Human Understanding* (hereafter ‘*Essay*’):

When I first began this discourse of the understanding, and a good while after, I had not the least thought that any consideration of words was at all necessary to it. But when, having passed over the original and composition of our *ideas*, I began to examine the extent and certainty of our knowledge, I found it had so near a connexion with words that, unless their force and manner of signification were first well observed, there could be very little said clearly and pertinently concerning knowledge, which, being conversant about truth, had constantly to do with propositions. (Locke, 1975 III ix §21)³⁰

To the contemporary philosopher, it is hardly surprising to discover that a comprehensive account of epistemology ought to have something to say about semantics. In the *Essay*’s ‘Epistle to the Reader’, Locke extols the achievements of the ‘master-builders’ of his ‘commonwealth of learning’. He has in mind the leading lights in the physical and medical sciences: Boyle, Sydenham, Huygens, and Newton. Locke sees himself as their ground-clearer, working as an ‘under-labourer in clearing the ground a little, and removing some of the rubbish that lies in the way to knowledge’ (Epistle to the *Essay*). This labour requires him to draw attention to the philosophical and scientific problems that can arise as a result of imprecise, ‘frivolous’ use of ‘uncouth, affected, or unintelligible terms’ in the discussion of important ideas. A similar unease over language’s capacity to mislead and the importance of constraining this capacity can be seen in the following remarks from Hobbes: ‘Philosophy professedly rejects not only the paint and false colours of

³⁰ Early on, Berkeley considers this a significant reason for some of the problems he finds in Book III: ‘Locke’s great oversight seems to be that he did not begin with his third book at least that he had not some thought of it at first. Certainly the 2^{1st} books don’t agree what he says in ye 3d’ (p. N717). This idea—that Locke should have addressed language first—is interesting given that in the early notebooks presentation, Berkeley chose the proposition that words must represent ideas as an axiom of his own system (N378-N378b and N356).

language, but even the very ornaments and graces of the same; and the first grounds of all science are not only not beautiful, but poor, arid, and, in appearance deformed.’ (Hobbes, 1969, p. 2)

As well as being concerned with abuses of language, the *Essay* offers an elaboration of the right use of language, and how it must be to figure in the sort of well-functioning epistemology Locke advertises. Since, for Locke, knowledge and understanding are active epistemic notions uniting agents and ideas in laudable ways, the organisation of these ideas—internally to the agent and in their transmission in public discourse—requires a robust account of meaning and language.

The proximity to a scientific revolution is palpable—Locke’s writing conveys that he believed that natural philosophy was finally well and truly on the way to giving knowers as many facts as they might want about the natural world, and that the principal job for the philosopher was to clarify the framework and definitions. This familiarity with the scientific developments of the time surely played a role in Locke’s further suggestion that many questions philosophers wished to answer, particularly questions of ultimate metaphysics which lay beyond the domain of empirical investigation, might be unanswerable in any kind of affirmative way. Locke says of ultimate substance that it is ‘something I know not what’ (Locke, 1975 II xxiii §2). As Daniel Garber notes:

[O]ne of Locke’s most important goals in writing the *Essay* was to clarify some of the ideas we have in order to settle certain important debates in the learned world, or, if not settle them, explain why they cannot be settled(...). It is in the context of this program that we must understand Locke’s project in Book II of the *Essay*, where he attempts to show how various of the ideas we have are derived from experience, from sensation and reflection. (Garber, 1987, p. 24)

When, in Book III: ‘On Words’, Locke arrives at his focused discussion of language, he introduces the topic with thoughts on our (created) nature as human beings, and the role of language in our status as creatures. God’s design of human beings can be understood in the context of our capacity for language. Language allows us to rise above mere impressions into the realm of predictable, reliable, explicable experience. Between Descartes’ account of humans as the essentially rational animal, and Hume’s rejection of exactly that in his account of our ultimately

animalist, habitual nature, Locke finds some middle ground in a view of the person as organiser and communicator of experience:

God, having designed man for a sociable creature, made him not only with an inclination, and under a necessity to have fellowship with those of his own kind, but furnished him also with language, which was to be the great instrument and common tie of society. Man, therefore, had by nature his organs so fashioned, as to be fit to frame articulate sounds, which we call words. (*Essay*, III i §1)

However, this must be balanced against Locke's anxiety about the damaging capacity of language. There is a certain amount of baggage that a contemporary reader brings the assessment of early-modern philosophy of language. As Lowe points out:

[O]ur concerns and his were very different, as are our and his presumptions regarding the relationship between linguistic inquiry and philosophical investigation. Philosophers trained in the Anglo-American analytic tradition are still inclined to see language and linguistic analysis as providing key insights into philosophical problems. In contrast, Locke, in common with many other seventeenth-century philosophers, tends to see language as a necessary but dangerous convenience: necessary as a means to clothe our thoughts in forms fit for others to apprehend them, but dangerous in being liable to abuse by those concerned to persuade us more by their eloquence than by the cogency of their reasoning. (Lowe, 2016, p. 299)³¹

This sense of caution is palpable in Locke's writing on language. So too is the sense that poor language use and manipulation deserves blame for a lot of the preceding incorrect philosophy—an accusation Berkeley will recharge later, in a significant way directing it back at Locke.

A similar anxiety may be read into a number of seventeenth century attempts to design languages with minimal scope for semantic corruption. Examples include John Wilkins' *Essay Towards a Real Character and a Philosophical Language* (1668)

³¹ This is also true of Berkeley in the early eighteenth century. Though Locke and Berkeley recognise the importance of language to the communication of knowledge etc., both seem acutely aware of the potential it has to mislead philosophically. Ultimately, though, what each man takes to be the source of confusion will differ significantly, and what Locke takes to be a key sin (language use involving words that represent no clear ideas) will ultimately be a foundation of Berkeley's mature account. Further, Berkeley's anxiety over language must be balanced against his sense that revised understanding of meaning is vital to the projects of his mature philosophy. This is discussed in greater detail in the next chapter.

and George Dalgarno's *Ars Signorum* (1661). Leibniz's better-known *characteristica universalis* (conceived circa 1676) criticised both Wilkins' and Dalgarno's attempts on the grounds that they prized practicality over scientific value, and he introduced his own attempt.³² The near-simultaneous emergence of these different proposed schemes suggests a seventeenth century concern with the capacity of language to precisely capture and translate the intentions of communicators.³³

To Locke, and perhaps Wilkins *et al*, it was obvious that pre-existing accounts of language and meaning were unfit for purpose and that the project of describing human understanding required its own significant book on language. '[...] I hope I shall be pardoned if in the Third Book I dwelt long on this subject, and endeavoured to make it so plain that neither the inveterateness of the mischief, nor the prevalency of the fashion, shall be any excuse for those who will not take care about the meaning of their own words, and will not suffer the significancy of their expressions to be inquired into' (Locke 1975, Epistle to the Reader).

Locke's theory of language and meaning are presented in Book III of the *Essay*. The highlights, as I see them, are as follows: words signify ideas in the mind of the speaker, and those ideas are the meanings of the words. This is what distinguishes us from parrots (Locke 1975, III i §1): an ability to 'use these sounds as signs of internal conceptions; and make them stand as marks for the ideas within his own mind, whereby they might be known to others, and the thoughts of men's minds be conveyed from one to another' (Locke 1975, III i §2). This process is not uniform and there are exceptions in the case of more semantically technical

³² The traditional thinking on Voltaire's choice of the name 'Dr Pangloss' (for his Leibnizian blusterer in *Candide*) is that it reflects Leibniz's fame as a polymath, and perhaps some feeling in Voltaire that Leibniz had something to say about everything, and not in a good way. Yet, it is pleasant to think that the 'Pangloss' character was also lampooning the idea of the universal language of *characteristica universalis* in his name selection, as the name might also suggest. Nicholas Cronk has suggested (in private correspondence) that this reading may make better etymological sense.

³³ See Jaap Maat's *Philosophical Languages in the Seventeenth Century* for account of the best-known of these 17th century artificial and auxiliary languages. He discusses their broad background and notes that 'projects of this kind were pursued in France, Italy, and Germany as well as in England. Neither were specific religious beliefs or clerical affiliations typical for the proponents of these schemes, as there were Catholic priests, Protestant reformers, as well as members of the Anglican clergy among them' (Maat, 2012, p. 2).

components such as negative terms, certain qualifying words, and, logical connectives (or, 'particles', which are 'made use of to signify the *connexion* that the mind gives to ideas, or to propositions, one with another'(Locke 1975, III vii §1)). Locke distinguishes general terms and their general ideas from particular terms and particular ideas, and implies that the semantics of names is a key component in understanding signification as it works in a well-functioning linguistic system:

Since all (except proper) names are general, and so stand not particularly for this or that single thing, but for sorts and ranks of things, it will be necessary to consider, in the next place, what the sorts and kinds (...) are, wherein they consist, and how they come to be made. These being (as they ought) well looked into, we shall the better come to find the right use of words; the natural advantages and defects of language; and the remedies that ought to be used, to avoid the inconveniences of obscurity or uncertainty in the signification of words: without which it is impossible to discourse with any clearness or order concerning knowledge: which, being conversant about propositions, and those most commonly universal ones, has greater connexion with words than perhaps is suspected. (Locke 1975, III i §6)

According to Landesman, '[s]trictly taken, Locke's theory is that *names* signify ideas in the mind of the speaker' (Landesman, 1976, p. 24). Though Book III contains commentary on a multitude of parts of speech/language, Locke's theory is, in the most part, a theory centred round a view of signification where nominal signification is either the archetype or the cornerstone. In Locke's initial presentation, the signification that exists between names and communicators is a three-termed relation obtaining between words, speakers and ideas. '[I]t was necessary that man should find out some external sensible signs, whereof those invisible ideas, which his thoughts are made up of, might be made known to others' (Locke 1975, III ii §1). Thus, Locke's theory of meaning is generalised from the working of meaning at the level of the individual user.

A fourth relation suggests itself immediately—what are we to think of the relationship between words used and the objects in the world that we may intend them to signify? Language has an external facing component that links words to our experiences of the world. Hannah Dawson notes this feature in her introduction to Locke's theory: 'Language has a thought-reflecting and world-reflecting component. Meanings are thoughts that in turn, if one is talking about the external

world, hook on to things' (Dawson, 2007, p. 7).³⁴ An account of Locke's thinking about external reference is not as forthcoming (in the *Essay*) as one might expect.³⁵ On this matter, Walter Ott has said the following:

For at bottom there is no room for an irreducible conception of *Bedeutung* in Locke's view. He can recast sentences involving ascriptions of reference easily enough, but he cannot, and does not wish to, accommodate the intuition that words directly refer to things. This is the heart of his disagreement with the Aristotelians. Insofar as one's sympathies lie with a Kripke/Putnam view of reference, one is apt to find Locke's position absurd. (Ott, 2004, p. 33)

This seeming absence of a devoted discussion of reference has been the subject of an exchange between Landesman and Kretzmann.³⁶ Indeed, it is tempting to think that the distinction made earlier between Locke's actual philosophy of language and the best Lockean-type theory of language is at its most lively on the issue of Locke's thinking on the semantical relation between word and world. Many accounts of Locke's philosophy of language seem to underplay the extent to which what Locke says about world-reference is quite puzzling in places.³⁷

Lowe distinguishes between the *semantic* (word-world), *cognitive* (thought/idea-world) and *expressive* (thought/idea-word) relationships with which Locke is concerned and acknowledges that: 'Locke's interest in language seems to focus first and foremost on its *expressive* character rather than on its *semantic* relations and properties' (Lowe, 2016, p. 301). The signification of ideas (by words) is prior for Locke, and perhaps the best way of thinking about this is as a

³⁴ See Pearce (2017, pp. 8-11) for further discussion of the Theory of Meanings and the relationship supposed between ideas and objects in that debate.

³⁵ By 'reference' I mean roughly the Fregean notion where sense and reference may be compared with form and content, or thought of as mode of presentation ('country of birth of George Berkeley' and 'most successful country in the history of the Eurovision Song Contest') versus thing picked out (Ireland, the country).

³⁶ See Landesman (1976).

³⁷ Being charitable to Locke, this is probably a natural consequence of providing what many philosophers take to be a first real discussion of philosophy of language, broadly speaking, in anything like the contemporary sense. There simply is no normal accepted terminology in this period. Especially for the 21st century reader, it is irresistible to interpret 'signify' and 'immediately signify', when used variously (as they are in Book III) as having importantly different meanings, and yet it may just be a case of emphasis that is more a result of Locke's perhaps over-generous prose.

continuation of his introduction of language as communication-focused.³⁸ The relations of speaker-word-idea are primary since, at some level, the involvement of objects as referents isn't necessary to the explanation of the interpersonal communication component of language (perhaps at a mature stage, since it might be natural to think that the learning of at least some words requires engagement with the world).

At the outset, Locke describes words as articulate sounds which we use as the signs of ideas. In the first instance, words stand for ideas in such a way that they 'stand as marks for the ideas within [a man's mind], whereby they might be made known to others, and the thoughts of men's minds be conveyed from one to another'. The first mention of reference to things in the world is when Locke says: 'It is not enough for the perfection of language, that sounds can be made signs of ideas, unless those signs can be made use of as to comprehend several particular things: for the multiplication of words would have perplexed their use, had every particular thing need of a distinct name to be signified by' (*Essay*, III i §3). It is unfortunate that the first reference to signification of objects is nested in a claim about generality of ideas.³⁹ Perhaps, having dwelled so long on ideas in Book II, Locke takes it that the relationship between ideas and the objects of sensation is so well explained that there is no need for additional clarification of any difference of relation between words-as-they-signify-ideas and words-as-they-signify-objects.⁴⁰ This may be so, but there is frustratingly little by way of connection offered in Book III. He claims that the origin of complex signification ('more abstruse significations') is in that of words marking 'common sensible ideas' (*Essay*, III i §5).

³⁸ As in Ott, 'the purpose of speech is to reveal one's mind to others' (2004, p. 33).

³⁹ Maybe this is an unfair desire for distinction between ideas of things and things in their relations to words (in likelihood brought about by a cursory knowledge of contemporary philosophy of language). That being said, the lack of clarity makes sense of Mill's swift rejection of the theory (on the grounds that sometimes we clearly do not mean *our idea of x* when we say 'x' as (for Mill) '[w]hen I say "the sun is the cause of the day" I do not mean that my idea of the sun causes or excites in me the idea of day; or in other words, that thinking of the sun makes me think of day.' (Mill, 1960, p. §1)

⁴⁰ If not for the difference in style, there are a number of places where one could be forgiven for thinking it was Berkeley speaking. Landesman finds it important that Locke's tentative view of substance means that no metaphysical dualism can be presupposed in the semantic theory. (Landesman, 1976, p. 25)

Words are the sensible and intended signs of the ideas of the speaker, and in a number of instances Locke's phrasing makes it seem as though it is ideas and ideas alone that words can signify. 'The use men have of these marks being either to record their own thoughts, for the assistance of their own memory or, as it were, to bring out their ideas, and lay them before the view of others: *words, in their primary or immediate signification, stand for nothing but the ideas of the mind of him that uses them*' (*Essay*, III ii §2, my italics). That this is an important point is underlined by how often he repeats it. The following is but a small selection:

The use then of words, is to be sensible marks of ideas; and the ideas they stand for, are their proper and immediate signification. (*Essay*, III ii §1)

Words, as they are used by men, can properly and immediately signify nothing but ideas, that are in the mind of the speaker... (*Essay*, III ii §4)

...this is certain, [Words'] signification, in [man's] use of them, is limited to his ideas, and they can be nothing else. (*Essay*, III ii §8)

A lot rides on the interpretation of 'signification' here, since if 'signification', for Locke, is the kind of relation that *can* hold between words and objects (as well as between words and ideas), then to say that words can 'properly and immediately signify nothing but ideas' is to deny that version of the world-relation in his theory.⁴¹

Locke's use of 'primary or immediate signification' is frustrating, since it suggests a potential distinction between immediate and mediate signification that is not made explicit anywhere in the text. If Locke's 'immediate signification' is a restricted sense of (a more general kind of) 'signification' that aims to characterise just the expressive relation between linguistic items and mental items, then to say that words can only *immediately* signify ideas is reasonably unsurprising and still leaves the door open to a form of *mediate* signification that accommodates objectual relations. If not, and 'immediately signify' and 'properly signify' mean much the same as 'signify' (in Locke's normal use of that word), then the claim he

⁴¹ Locke's tendency to move between 'signification' and 'immediate signification' is made much of in Kretzmann (1968, pp. 6-8).

makes over and over again is a drastic one, and is perhaps rightly classified as a 'blunder'.

Landesman, in engaging with this issue, presents a view of Locke sometimes using 'idea' in a way that is consistent with its referring to objects of intention. Landesman says: 'Both "idea" and "mental proposition" are used ambiguously to designate either a mental operation (or a constituent of one) or an object of a mental operation (or a constituent of one).' He thinks this ambiguity is active in Locke's discussion of signification:

Now, if I wish to convey my thoughts to another, I want him to understand the things I am thinking of. "Idea" then can either mean the intentional object, that which I am thinking of, or the act of thinking of that object, or the conception I have, or the mental representation of it when I think of it. Nothing can be an intentional object unless it is referred to in an act of thought or conception or mental representation. In this sense, intentional objects, although they may be public in one sense, also qualify as internal conceptions in another. So the argument is at least consistent with the interpretation that the things signified are among the intentional objects. (Landesman, 1976, p. 31)

Thus, on this kind of account, perhaps we can just assume Locke's use of 'idea' includes intentional objects whenever and wherever it should (though, this is certainly in the 'what Locke should have said rather than did say' domain, since Locke seems to claim in Books I and II that ideas and the object they represent are metaphysically distinct and thus this view is at least under-explained).⁴² One point that I find supportive of the Landesman interpretation (because of its seeming emphasis on the necessity of some intermediary idea) is the following excerpt from the chapter 'Of the Signification of Words': 'A man cannot make his words the signs

⁴² See especially Locke (*Essay*, II viii §3): *Ideas in the mind distinguished from that in things which gives rise to them.* 'Thus the ideas of heat and cold, light and darkness, white and black, motion and rest, are equally clear and positive ideas in the mind; though, perhaps, some of the causes which produce them are barely privations, in those subjects from whence our senses derive those ideas. These the understanding, in its view of them, considers all as distinct positive ideas, without taking notice of the causes that produce them: which is an inquiry not belonging to the idea, as it is in the understanding, but to the nature of the things existing without us. These are two very different things, and carefully to be distinguished; it being one thing to perceive and know the idea of white or black, and quite another to examine what kind of particles they must be, and how ranged in the superficies, to make any object appear white or black.'

either of qualities in things, or of conceptions in the mind of another, whereof he has none in his own. Till he has some ideas of his own, he cannot suppose them to correspond with the conceptions of another man; nor can he use any signs of them of another man; nor can he use any signs for them: for thus they would be the signs of he knows not what, which is in truth to be the signs of nothing' (*Essay*, III ii §2).

With something like a basic infrastructure of words, ideas, minds and the world in place it is easy to see how language is central to Locke's account of knowledge. When he explains the role of language in knowledge in the last book, it is introduced via an unequivocal statement about the nature of knowledge:

Knowledge then seems to me to be nothing but the perception of the connexion of and agreement, or disagreement and repugnancy of any of our ideas. In this alone it consists. Where this perception is, there is knowledge, and where it is not, there, though we may fancy, guess, or believe, yet we always come short of knowledge. (*Essay*, IV i §2).

Ideas are the meanings of words and the proper objects of knowledge on the Lockean view. For Locke, knowledge is the recognition of certain relations among word meanings and the parts of experience they signify.

What is crucial for thinking about Berkeley's engagement with this philosophy is that Locke clearly thinks ideas are in some sense necessary for every instance of meaningful language use, and thus knowledge. This view is made use of repeatedly by various among the people Berkeley considers to be freethinkers.⁴³ Berkeley's perception of their approach to the idea theory of meaning is that it can be used as a criterion for determining whether the concepts of a certain discipline are intelligible or not, and whether they make rational discourse about that discipline impossible. This view will come in for very explicit criticism in the functionalist and pragmatic picture of language presented in *Alciphron*, but the claim that a word must represent an idea in all instances of meaningful use is rejected much earlier.⁴⁴

⁴³ Especially by Toland, as I discuss in detail in the next chapter.

⁴⁴ Pearce (2017) argues that Berkeley has an interest in a broader set of views he calls the 'Theory of Meanings'. However, I think it's fair to say that at this very early stage in his philosophical thinking (at the time when he endorses some version of Locke's idea theory), he has Locke in mind as the central figure in the debate. The other sources

1.3

Berkeley's Reception of Locke

Locke's influence on Berkeley is very obvious from the notebooks—there are an impressive 71 mentions of Locke by name—and Berkeley engages with what he takes to be the Lockean position on a number of different philosophical topics.⁴⁵ Only Malebranche competes for Berkeley's early philosophical attention, and, at 15 mentions, it's not even close.

Among the Lockean positions Berkeley endorses are Locke's 'bantering' of material substances (N289),⁴⁶ his reluctance to define motion in abstract terms (N450-1),⁴⁷ and his suggestions that much of the discourse of earlier philosophies may be philosophically empty (N492).⁴⁸ A striking early reminder of his admiration of Locke is his immediate recommendation of Locke's *On Education* to his friend Percival on the occasion of the birth of his first child:

Pearce discusses (the Port-Royalists and John Sergeant) use representations as meanings in different ways, and so, on his account, Berkeley's eventual gripe is with a family of views (Theories of Meanings) rather than the narrower view (The idea theory of meaning). I agree that Berkeley's criticisms cut against these other views, but I do think the roots of his complaints about existing theories of meaning are to be found primarily in his engagement with Locke's presentation. Further, as I argue in the next chapter, Berkeley's angst is particularly exacerbated by Toland's use of Locke in his application of the theory to questions of religious intelligibility.

⁴⁵ Sometimes the Locke references are approbative, as is clear from this (somewhat backhanded) praise: 'Wonderful in Locke that he could when advanced in years see at all thro a mist that had so long a gathering & was consequently thick. This more to be admir'd than that he didn't see farther.' (N567) Backhanded or not, I think it is indicative of a sense that Locke had begun to clear a way through some problems in previous philosophy that Berkeley saw as important.

⁴⁶ 'M Material substance banter'd by Locke b.2c.13.s.19.'

⁴⁷ 'P¹ Motion distinct from the thing moved is not Conceivable. N Mem: to take notice of Newton for Defining it also of Locke's wisdom in leaving it undefin'd.

⁴⁸ 'We have learned from Mr. Locke. that there may be and that there are several glib, coherent, methodical Discourses which nevertheless amount to just nothing, this by him intimated with relation to the Scholemen. We may apply it to the Mathematicians.'

May he inherit your good qualities as well as our estate in order to which I entreat you will read Mr Locke's book of Education that abounds with excellent maxims. And, believe me, the foundations of a useful and healthy man cannot be laid too early. (Hight, 2012, p. 55)⁴⁹

Berkeley also displays his familiarity with Locke's political writings in one of the earliest of his collected correspondences (1709). Berkeley discusses the merits of William Higden's recently published *A View of the English Constitution*. On the question of 'bounds on [regents'] power who rule' Berkeley urges Percival to read 'Mr Locke's *Treatise of Government*' for a superior account of that topic.

Frequently, Berkeley's notebook remarks show a very active philosophical engagement with Locke: 'N.B. to consider well what is meant by that which Locke saith concerning algebra that it supplies intermediate ideas.' (N697) Often, his references to Locke are more critical, as in the contemplation of Locke's account of the idea of God: 'Qu: How can our idea of God be complex or compounded, when his essence is simple & uncompounded v. Locke b.2.S 35' (N177). He is similarly critical of Locke's apparent endorsement of priority in matter and motion: 'Locke's very supposition that matter & motion should exist before thought is absurd, includes a manifest contradiction' (N573). In addition, Berkeley makes note (often without sustained discussion) of times when Locke just gets it wrong, or where his own theory will improve upon Locke's account of a particular notion.⁵⁰

What is clear is that Berkeley saw Locke as one of the most relevant authorities in the project in which he takes himself to be participating. Further, the feeling that he is in some sense of a kind with Locke is, I think, apparent from the following:

Pure intellect I understand not.

Locke is in the right in those things wherein he differs from the Cartesians & they cannot but allow of his opinions if they stick to their own principles or cant of existence & other abstract ideas. (N810-11)

⁴⁹ The fact that *On Education* was the guidebook for Locke's educating and instructing of Shaftesbury (one of Berkeley's major later critical targets) makes this somewhat ironic.

⁵⁰ Such critical mentions can be found in the notebooks: N49, N80, N89, N123, N177, N298, N319, N495, N526, N554, N555, N561, N563, N565, N573, N586, N598, N601, N610 and N650.

Many of the references to Locke in the notebooks concern the views on language and knowledge expressed in the third and fourth books of the *Essay*. As might be fairly expected from a set of notebooks never intended to see the light of day, Berkeley's position on Locke's views on language and its relation to knowledge is difficult to extricate, and sometimes it seems like in reading the notebooks we are witnessing him change his mind, or move from deference to defiance of Locke.⁵¹ What is clear is that in material prior to the *Principles Introduction*, Berkeley, at various points (in some sections of the notebooks and in 'Of Infinities'), endorses much of Locke's philosophical method, including the view that words must be associated with ideas—it is even stated as an early axiom of the system he is devising. However, by the time of the publication of the *Principles*, this view has been assuredly revised, and Berkeley not only explicitly rejects that word-idea thesis, but rails against one case of it as a significant sickness of the contemporary philosophy. The shift towards the more pragmatist theory outlined in the 7th dialogue of *Alciphron* might be seen as a result of Berkeley's discovering the unsuitability of that theory to a number of the concepts that his religious views required.

'Of Infinities' and Berkeley's Notebooks

'Of Infinities' gives a clear expression of Berkeley's early commitment to the idea theory of meaning. 'Of Infinities' was a short article that Berkeley presented to the Dublin Philosophical Society, preserved among the 'Molyneux Papers' in the Trinity College library and first published in 1901. The date is uncertain, but it is estimated

⁵¹ I discuss the importance (to the current project) of including material from the notebooks in chapter 3 in more detail. For the current purposes, I hope it will suffice to say that in an analysis of Berkeley's language where a key theme is Berkeley's movement through and beyond a Lockean linguistic philosophy, it is important to include the material which showcases this early engagement with the idea theory of meaning at its most positive (and perhaps unreflective). So, in this sense, I use them in this chapter reasonably unsystematically, and primarily to show that in this early period he was at one or two points committed to the theory he later dramatically rejects.

by Luce and Jessop to have been produced between 1707 and 1708.⁵² Thus, it is thought to be from within the same period as the notebooks. The paper is about the use of infinitely small entities in natural philosophy, and discusses disputes that arise out of their use in geometry. Berkeley proposes that ‘one passage in the incomparable Mr. Locke’s treatise’ (the *Essay*) allows for the successful dissolution of these disputes. The Locke passage he takes to relieve geometers of their burden is from: ‘Difference between infinity of space, and space infinite’ (*Essay*, II xvii §7):

Though our idea of infinity arise from the contemplation of quantity, and the endless increase the mind is able to make in quantity, by the repeated additions of what portions thereof it pleases; yet, I guess we cause great confusion in our thoughts, when we join infinity to any supposed idea of quantity the mind can be thought to have, and so discourse or reason about an infinite quantity, as an infinite space, or an infinite duration. For, as our idea of infinity being, as I think, an endless growing idea, but the idea of any quantity the mind has, being at that time terminated in that idea, (for be it as great as it will, it can be no greater than it is,)—to join infinity to it, is to adjust a standing measure to a growing bulk; and therefore I think it is not an insignificant subtilty, if I say, that we are carefully to distinguish between the idea of the infinity of space, and the idea of a space infinite. (*Essay*, II xvii §7)

The predominant thought in the opening paragraph of Berkeley’s essay is that in Locke’s philosophy and the ‘judgement & clearness wch is so peculiar to him’ (‘Of Infinites’) lies the solution to a whole host of entanglements arising around the topic of infinitely-x entities/quantities, where x is a property known by experience. The improvement or development Berkeley suggests is that Locke’s thought on the predication of infinite largeness might be applied to cases involving infinitely small quantities *mutatis mutandis*. Given the estimation of date provided by Luce and Jessop, this is probably the earliest statement of Berkeley’s anxieties around the modern mathematical analysis. This anxiety resides in the ‘obscurity & confusion’ which surrounds the new mathematics, and Berkeley suggests some Lockean distinctions can relieve some pressure.

⁵² This is the same period they suggest for the writing of the notebooks—between June 1707 and the autumn of 1708.

The position articulated in 'Of Infinities' is that we can have an idea of an infinity of space but not one of space infinite, or space infinitely large. From Locke's point of view, an infinity of space is conceivable—we concentrate on our idea of the infinite, which is for him a notion of endless growing, incompleteness, and consider it in the domain of space. Space infinite is different because it involves predicating of a known, stable feature of experience (i.e. space) an unstable, incomplete qualification. The resultant idea is bound to be problematic, according to Locke.

For Locke, finitude and infinitude are the 'modes of quantity' (*Essay*, II xvii §2), and are to be attributed to things with parts. We generate an idea of infinity from finite ideas. Our idea of infinity is almost a meta-idea, one generated out of the experience of manipulating finite ideas (via operations such as repeating, joining, adding, doubling, multiplying...) and recognising that that process of reproduction might be continued indefinitely. It corresponds to a power or potential in us to continue along the same lines – 'after he has continued this doubling in his thoughts, and enlarged his idea as much as he pleases, he has no more reason to stop, nor is one jot nearer to the end of such addition, than he was at first setting out: the power of enlarging his idea of space by further additions remaining still the same, he hence takes the idea of infinite space (*Essay*, II xvii §3).⁵³ This is the idea of the infinite that Locke thinks may be considered in the domain of space. Berkeley, in 'Of Infinities', supposes the same analysis may be applied to the parts of mathematics that require infinitely small components.

'Of Infinities' is interesting for the very enthusiastic expression of Locke's views it represents, and this very explicit endorsement of Locke's central claim about meaning.

This (...) is very common with writers of fluxions or the differential calculus, &c. They represent, upon paper, infinitesimals of several orders, as if they had ideas in their minds corresponding to those words or signs, or as if it did not include a contradiction that there should be a line infinitely small & yet another infinitely less than it. 'Tis plain to me we ought to use no sign without an idea answering to it; & 'tis as

⁵³ This example is prior to the discussion of the difference between the idea of an infinity of space, and the idea of space infinite.

plain that we have no idea of a line infinitely small (...). (Berkeley G. , 'Of Infinities', 1951, p. 236)

Here it is clear that he takes a central problem for the mathematicians to be that they are guilty of using words/signs where there are no associated ideas. This endorsement of Locke's theory of meaning is quite decisive, and is interesting given his strong rhetoric against it in the *Principles Introduction*. It is possible to connect this favourable approach to the idea theory in 'Of Infinities' to similar sentiments in the notebooks at what Luce and Jessop judge to be roughly the same time, so it is reasonable to suppose that Berkeley did see it as a central plank of any future system in the period predating the *Principles*.

The following set of axioms appears in the notebooks, following the definitive plank of his new philosophical system: 'An idea cannot exist unperceiv'd.' (N378)

- +1 All significant words stand for Ideas
- 2 All knowledge about our ideas.
- +3 All ideas come from without or within.
- 4 If from without it must be by the senses & they are call'd sensations.
- +5 If from within they are the operations of the mind & are called thoughts.
- 6 No sensation can be in a senseless thing.
- 7 No thought can be in a thoughtless thing. (N378)

These arguments must be proposed shorter & more separate in the Treatise. (N378a)

N.B. Other arguments innumerable both a priori & a posteriori drawn from all the sciences, from the clearest plainest most obvious truths whereby to demonstrate the principle i.e. that neither our ideas nor any thing like our ideas can possibly be in an unperceiving thing. (N379a)

It is difficult to interpret this as other than note-making on the roll-out of Berkeley's own philosophical system. Berkeley's abbreviations (using letters and symbols) make understanding his thinking here difficult. Though he provides a key for the meanings of the letters, there is less certainty on the issue of his use of symbols.

According to Robert McKim:

The two most frequently occurring signs are “X,” which seems to signify that the entry is about extension, and “+.” There is some disagreement about the meaning of the “+” sign. This is not a trivial matter because it has a bearing on how we ought to read many entries. Recent interpreters generally have taken “+” to mean “delete” or “disregard”. This view is in spite of the decisive evidence against it. (McKim, 2005, p. 65)

The two pieces of evidence McKim cites in this matter are as follows: the view that the symbol had the meaning attributed above mostly came from somewhat under-investigated recommendations of Luce in his *edition diplomatica* of the notebooks. In later work, McKim notes, Luce withdrew his former position on the interpretation of ‘+’, believing that there was little concrete to be said in support of the reading. Thus, its continued status as the standard reading is not even supported by its own initial proponent. The second piece of evidence given by McKim for Luce’s change of mind was the doctoral thesis of Bertil Belfrage. In light of Belfrage’s criticism of Luce’s ‘Commentary Hypothesis’, Luce moved from his interpretation of the ‘+’ as ‘a sort of *obelus*, [set] against those entries which he found he could not use’ (quoted in Luce (1970, p. 8)), to a more tentative view, acknowledging that though the obelus interpretation was helpful in thinking about most cases, it also unwisely assumed the possibility of rigidly and directly translation where there probably was none:

It is idle to look for *the meaning* of the plus sign as we look up *the meaning* of a word in the dictionary. Probably the plus sign was to Berkeley originally no more than a labour-saving device, enabling him to run his eye quickly down the pages without being delayed by trivialities and without foreclosing on open questions. (Luce A. , 1970, p. 10)

Whether Berkeley’s choice to append the symbol to the axiom concerning words and ideas constitutes evidence of a change of mind, or, in line with Belfrage’s and (later) Luce’s more conservative analysis, simply conveys that he needed to think more about his endorsement of that claim, the notebooks clearly show that there was a time when Berkeley was committed to the self-evident or axiomatic truth of

the idea theory of meaning. Its position as an axiom in his new system is indicative of a sense that it was for him something like a fundamental principle.⁵⁴

Yet, by 1709 we see him defending exceptions to the idea theory in his correspondences,⁵⁵ and soon after, he rejects it firmly in his introduction to the *Principles*. This rejection of the idea theory of meaning seems to have had a significant influence on the later philosophy, as is clear from his stating many of philosophy's problems in those terms.

An Essay Towards a New Theory of Vision: Ordinary Communication and the Divine Language Theory

The issue of the correct interpretation of the relationship between the *NTV* and the *Principles* is complicated.⁵⁶ One theme that has attracted some attention is the question of exactly how deep into the ultimate position of immaterialism Berkeley is—or is willing to show himself to be—in the *NTV*. He denies the mind-independent “reality” of the immediate objects of vision, but where is he on the objects associated with the other sense modalities? The extent of his commitment in the text to the existence of a material world (available only through haptic perception) has been questioned. But, the following excerpts make it appear that he is contrasting the mind-dependence of the objects of vision with the mind-independence of the objects of touch:

In order therefore to treat accurately and unconfusedly of vision, we must bear in mind, that there are two sorts of objects apprehended by the eye: The one, primarily and immediately, the other secondarily and by intervention of the former. Those of the first sort neither are, nor appear to be without the mind, or at any distance off. They may indeed grow greater, or smaller, more confused, or more clear, or more faint. But, they do not, cannot approach, or recede from us. Whenever we

⁵⁴ For additional discussion of this change in the early philosophy, see Belfrage (1985), (1986), and Berman (1994).

⁵⁵ See particularly the 1709 letter to Molyneux discussed at the end of this chapter (Hight, 2012, p. 29).

⁵⁶ See discussion in Atherton (1990) and Armstrong (1960).

say an *object* is at a distance, whenever we say, it draws near, or goes farther off; we must always mean it of the latter sort, which properly belong to the *touch*, and are not so truly perceived, as suggested by the eye, in like manner as thoughts by the ear. (NTV, §50)

For all visible things are equally in the mind, and take up no part of the external space: And consequently are equidistant from any tangible thing which exists without the mind. (NTV, §111)

This suggests an interesting philosophical trajectory in which Berkeley, whom we know from the notebooks to have rehearsed his arguments for immaterialism in some detail at that earlier stage, presents a theory of perception that is highly amenable to immaterialism, but not explicitly committed to it. It also seems that he is genuinely treating the objects of touch as mind-independent in this work. Reflecting on the NTV in the *Principles*, he characterises things as follows:

The ideas of sight and touch make two species, intirely distinct and heterogeneous. The former are marks and prognostics of the latter. That the proper objects of sight neither exist without the mind, nor are the images of external things, was shown even in that treatise. Though throughout the same, the contrary be supposed true of tangible objects: Not that to suppose that vulgar error, was necessary for establishing the notion therein laid down; but because it was beside my Purpose to examine and refute it in a discourse concerning *vision*. (*Principles* §44)

This may have been a tactical decision to popularise a perceptual theory amenable to his metaphysics before presenting that metaphysics itself—a sort of gateway drug approach. Such thinking would not be unfamiliar to Berkeley who discussed in letters his presentation and editing of the *Principles* so as to minimise the sense for the uninitiated reader that he was going to be making a bold metaphysical claim. The following excerpt is from a letter to Percival the year of the publication of the *Principles*:

However, I imagine whatever doctrine contradicts vulgar and settled opinion had need been introduced with great caution into the world. For this reason it was I omitted all mention of the non-existence of matter in the title page, dedication, preface, and introduction, that the notion might steal unawares on the reader, who possibly would never have meddled with a book that he known contained such paradoxes. If, therefore, it shall at any time lie in your way to discourse your friends on the subject of my book, I entreat you not to take notice to them that I deny the being of matter in it, but only that it is a treatise of human

knowledge designed to promote true knowledge and religion (...).
(Hight, 2012, p. 44)

This relationship between the *Principles* and *NTV* has seen discussion in previous literature.⁵⁷ In what follows, I will try to heed the advice Margaret Atherton provides in her introduction to the study of Berkeley's visual theory:

Instead of reading the *New Theory* as a preliminary version of his later metaphysics, we should understand it as principally addressed to a positive program for solving some problems in the theory of vision. I intend to argue, moreover, that a richer understanding of the project of the *New Theory* will also shed light on Berkeley's wider projects and show them to be less exotic and less misguided than has been supposed. (Atherton M. , 1990, p. 5)

Atherton urges against reading the *NTV* as a 'half-way house' to immaterialist metaphysics. I think her assessment is correct, and, as she argues elsewhere,⁵⁸ it is a shame that the contemporary success and considerable consensus on the merit of *NTV* is too often lost in the dismissive approach many in modern-day philosophy take to Berkeley's idealism and immaterialism. That being said, I think if one is trying to trace one theme (language) through Berkeley's philosophical progress, it is important to give some credit to the idea that, from Berkeley's point of view, it looks like he himself wrote it in such a way that a large part of his intention is to disseminate a reasonably metaphysically neutral account of perception that would open the door to the eventual withdrawal of the metaphysical restraint.

1.4

Language in the *New Theory of Vision*

The main business of the *NTV* is initially at some remove from language. Berkeley's project in the *NTV* is to provide a positive theory of vision that is consistent with his empiricist principles—one that offers an alternative to the 'geometric' Cartesian

⁵⁷ See especially Atherton (1990) and Armstrong (1960).

⁵⁸ See Atherton (2005).

account which he finds hopelessly problematic. The two stated aims of the text are (i) to provide an account of how we see distance, size and position, and, (ii) to distinguish the objects of sight and touch. He provides his own distinctive account of mature vision, in which we visually perceive distance only mediately,⁵⁹ via the immediate percepts of vision (the two-dimensional array of *minima visibilia*) and sense of touch (the experience of sensations in the eye—we take objects to be at a greater distance from us when we must strain our eyes in order to bring them into focus). His other significant thesis is referred to in the scholarship as the *heterogeneity thesis*, which is the claim that '*(s)trictly speaking, we never see and feel the same thing*' (*NTV* Contents §49).⁶⁰ These two goals are rendered explicit in his opening phrase:

My design is to shew the manner, wherein we perceive by sight the distance, magnitude and situation of Objects. Also, to consider the difference there is betwixt the ideas of sight and touch, and whether there be any idea common to both senses. (*NTV*, §1)

Ultimately, *NTV* includes numerous interesting allusions to Berkeley's thinking on language. It is in this text he first introduces his theory of the divine language of nature. He also discusses the more ordinary communicative sense of language in assessing the role it plays in our conceptualising the objects of perception. In Berkeley's frequent critical mentions of the 'geometric' theorists' (particularly Descartes's⁶¹) desire for a (mathematically adequate) necessary connection between the immediate and mediate components of the visual perception of distance, Berkeley appeals to language for analogy. In Berkeley's view, the experience-dependence of the visual perception of distance means that the connections between the mediate and immediate percepts are habitual.

From all which it follows that the judgement we make of the distance of an object, view'd with both eyes, is entirely the result of experience. If we had not constantly found certain sensations arising from the

⁵⁹ 'It is, I think, agreed by all, that distance, of it self and immediately, cannot be seen' (*NTV* §2).

⁶⁰ The development of this idea in greater detail begins in the body of *NTV* at §47.

⁶¹ An interesting letter from the same year outlines Berkeley's various complaints about Descartes' broader philosophy, specifically the content of the *Meditations*. After some specific criticism he stops himself, saying 'But it would take up too much time to observe to you all the like blunders that appeared to me when I formerly read that treatise' (Hight, 2012, p. 30).

various dispositions of the eyes, attended with certain degrees of distance, we shou'd never make those sudden judgements from them, concerning the distance of *objects*; no more than we wou'd pretend to judge of a man's thoughts, by his pronouncing words we had never heard before. (*NTV*, §20)

He uses the analogy of language to elucidate the possibility of the experiential indicators of distance (confusedness/vividness, sensation of eye strain etc.) having been otherwise or even opposite, saying:

This case is much the same as if we shou'd suppose an Englishman to meet a foreigner who used the same words with the English, but in a direct contrary signification. The Englishman wou'd not fail to make a wrong judgement of the ideas annexed to those sounds in the mind of him that used them. (*NTV*, §32)

This section is consistent with (and even seems to presuppose) the conventional claims of the idea theory of meaning—to understand the meaning of the word is just to have a good sense of the idea that accompanies it in the mind of speaker.

The second half of the *NTV* pursues the thesis that the objects of the faculties of sight and touch are different, and that the objects of sight exist only in the mind. The role of language in obscuring things features in his initial statement of the heterogeneity thesis:

That which is seen is one thing, and that which is felt is another. If the visible figure and extension be not the same with the tangible figure and extension, we are not to infer that one and the same thing has diverse extensions. The true consequence is, that the objects of sight and touch are two distinct things. It may perhaps require some thought rightly to conceive this distinction. And the difficulty seems not a little increased, because the combination of visible ideas hath constantly the same name as the combination of tangible ideas wherewith it is connected. Which doth of necessity arise from the use and end of language. (*NTV*, §49)

Here, Berkeley is referring to ordinary communication and its influence over our philosophical thinking—his claim is that language and our linguistic practice encourages or reinforces a conceptual confusion about the cause and nature of our perceptions. On Berkeley's view, experience constantly conjoins related visual and tangible ideas in our experience. This means (i) that we are likely to mistake what are actually distinct entities as one singular entity, and (ii) that our language practices will both reflect and reinforce this error. If our language accurately

reflected our experience, in his view, there would be no talk of ‘seeing’ some tangible property of an object:

So that in truth, and strictness of speech, I neither see distance it self, nor any thing that I take to be at a distance. I say, neither distance, nor things placed at a distance are themselves, or their ideas, truly perceived by sight. (...) Sitting in my study I hear a coach drive along the street; I look through the casement and see it; I walk out and enter into it; thus, common speech would incline one to think I heard, saw, and touch’d the same thing, to wit, the coach. It is nevertheless certain, the ideas intromitted by each sense are widely different and distinct from each other; but having been observed constantly to go together, they are spoken of as one and the same thing. (*NTV*, §45-46)

Thus, our linguistic descriptions of perception have a masked metaphorical aspect with the natural result that we speak of the ideas of sight and ideas of touch as though they were the same ideas. The singular grammar will reinforce the view of ‘an apple’ as a unitary entity rather than a combination of a tangible-apple-idea and visual-apple-idea (and ideas of whatever other modalities may arise when having experiences with apples). This disguises the semantic element of what Berkeley would see as a sign (the word ‘apple’) referring to a collection of ideas (any of the modal experiences of apples).⁶² Berkeley re-emphasises the role language plays in this again a little later:

No sooner do we hear the words of a familiar language pronounced in our ears, but the ideas corresponding thereto present themselves to our minds: in the very same instant the sound and the meaning enter the understanding: So closely are they united, that it is not in our power to keep out the one, except we exclude the other also. We even act in all respects as if we heard the very thoughts themselves. (*NTV*, §51)

Here, Berkeley emphasises the involuntary element of the occurrence of a corresponding idea in the processing of the word/sign in an instance of communication. This is strongly reminiscent of the Lockean idea-theory picture, since Berkeley is noticing a seemingly unavoidable feature of that theory: hearing meaningful speech causes us to have certain mental experiences—ideas present themselves to the mind. In line with the Locke sketch, it seems that at the receiving-end, processing a piece of language is to hear/see the relevant sign, and to have

⁶² The uniformity and ubiquity of this singular grammatical treatment is also noted in the notebooks: ‘Qu: how came visible & tangible qualitys by the same name in all languages?’ (p. N43)

this irresistibly accompanied by an appropriate mental item. In fact, the framing in the above section seems to *equate* ‘the very thoughts themselves’ with the ‘meaning’.

This involuntary association (e.g. the combination of hearing ‘apple’ and having apple-experiences—potentially multi-modal ones with respect to sense organs) misleads us in thinking about the composition and nature of ordinary objects. An apple, which, according to Berkeley, is not a simple idea, but typically given in experience as a changeable complex of *minima visibilia* and ideas from other sense faculties (its cold, firm feel in the hand, its acidic, sweet taste etc....). The question of ontology in *NTV* lingers. Does the text contain the same idealist and immaterialist commitments we find in the *Principles*? We know from the *NTV* that the source of visual experience is not a material external world:

Upon the whole, I think we may fairly conclude that the proper objects of vision constitute an universal language of the Author of nature, whereby we are instructed how to regulate our actions, in order to attain those things that are necessary to the preservation and well-being of our bodies, as also to avoid whatever may be hurtful and destructive of them. It is by their information that we are principally guided in all the transactions and concerns of life. (*NTV*, §147)

Thus, for Berkeley, the objects of vision are themselves linguistic, or components of a language. This necessitates a brief prologue to a more detailed discussion that will follow on Berkeley’s thinking on divine ‘communication’ and the divine language argument that takes place in *Alciphron*. What must be noted for now is that Berkeley’s positions on causation and the metaphysics of perception mean that all experience has a linguistic character, at least by such time that the *Principles* have fully taken the possibility of a role for material substance (in haptic experience) off the table. It is essentially semiotic, and powered by an intentional intelligence. By taking matter out of the scheme in the explanation of sense experience, and committing to a causal view that makes proper causation the preserve of agent minds, Berkeley has replaced passive perception with an archetypal kind of communication. To experience the world is not to randomly receive or perceive one’s surroundings; it is being talked to, being directed in action via a language. Pearce (2017) argues that, taken seriously and understood correctly,

this linguistic understanding of experience offers a solution to the structural problems he regards as inherent in Berkeley's metaphysics.

Berkeley draws a comparison between the two following phenomena: 1) the 'irresistible' movement from receiving a linguistic sign (word/phrase) to conceiving of an appropriate idea, and 2) the observing of some element of visual experience (seeing something) and an involuntary inference or psychological connection to components of mediate perception (e.g. the tangible properties of some object). The following excerpt continues from the end of the quote before the previous one, in which he discusses the involuntary move from sign to idea:

So likewise the secondary objects, or those which are only suggested by sight, do often more strongly affect us, and are more regarded than the proper objects of that sense; along with which they enter into the mind, and with which they have a far more strict connection, than ideas have with words. Hence it is, we find it so difficult to discriminate between the immediate and mediate objects of sight, and are so prone to attribute to the former, what belongs only to the latter. (*NIV*, §51)

Therefore, in Berkeley's philosophy, there are truly two senses of communication and language. The first, archetypal kind is that by which God communicates with us about experience. In the *NIV* this discussion takes place as though he is committed to the view that, while the objects of touch may be material objects out in the world, the ideas constituting visual experience are caused by God, and having no existence distinct from in minds.

Though there is no evidence of a shift away from the orthodoxy of the idea-theory in the content of the *NIV*, and indeed §32 and §51 serve as evidence against such a shift, there are good reasons for thinking that by late 1709 Berkeley's position has already changed to reflect new thinking about language. One relevant thought is that, since it seems that Berkeley is tactically holding back from the more radical parts of his metaphysics in the advancement of his views of perception, it is equally reasonable to think that he might similarly avoid challenging a position on meaning which, as Pearce (2017, pp. 8-12) argues, was 'at the centre of an entire tradition of theorizing about language that stretches back to Plato and Aristotle' (Pearce K. L., 2017, p. 8). It seems plain from his correspondences that the decisive rejection of the idea theory found in the *Principles* was already being defended by

Berkeley. In a letter to Molyneux of December 8th, 1709, Berkeley makes the following remarks:

Dr Molyneux, You desire to know my thoughts, first, whether the ideas laid up in the imagination are all images of what they represent, and secondly whether we can reason without ideas, and if not how comes it that we can reason about a chiliagon whereof we cannot frame an idea? (...) To the second, I answer, that we may very well, and in my opinion often do, reason without ideas but only the words used, being used for the most parts as letters in algebra, which though they denote particular quantities, yet every step do not suggest them to our thoughts, and for all that we may reason or perform operations entirely about them. (Hight, 2012, p. 29)

By the time of the *Principles*, Berkeley has moved to wholesale rejection of the idea theory of meaning (this is discussed further in Chapters 2 and 4) and has come to regard it as a serious mistake of the new philosophy. This rejection becomes a basic plank of the proto-pragmatic philosophy espoused in *Alciphron*.

Chapter 2: The Philosophy of *Alciphron*

2.1

Introduction

Alciphron is vital to my interpretation of *The Analyst*. I argue that that *The Analyst* is, philosophically speaking, straightforwardly a continuation of *Alciphron*. Taken together, the two form companion arguments against freethinking. One (*Alciphron*) speaks the Berkeleyan language of pragmatism and context-sensitivity, and offers Berkeley's positive philosophical outlook. The other (*The Analyst*) works "from behind enemy lines" and operates within the paradigm advanced by Berkeley's opponents, the freethinkers, in order to show the anti-instrumentalist and damaging consequences of their rival philosophical outlook. In this chapter, I argue that a significant change of emphasis takes place in the philosophy of *Alciphron* and suggest that we should take this emphasis-shift as indicative of a modification in philosophical priorities for Berkeley; specifically, with respect to the relationship between his pragmatism and empiricism. Although it is true that in *Alciphron* (and the surrounding philosophy) Berkeley provides evidence of some retention of his more distinctive views on empiricism (and the attendant metaphysical and epistemological theories), these views are relegated to a different position in his philosophising, relative to his earlier best-known work. The continuity is significant—especially when contrasted with *Siris*, where the relationship to the old work is *much* less clear.⁶³ And yet, there are significant changes, which I discuss in the chapter.

⁶³ The consternation over the interpretation of *Siris* is evident from Jessop's evaluation of Fraser's position on that work: 'Ever since Fraser recalled attention to *Siris*, it has been assumed that this work presents a contradiction, if not a recantation of Berkeley's earlier philosophical position. The empiricist, we are told, has become a rationalist; the abstractions formerly banished are reinstated as the only realities; the former dismissal

In Berkeley's earlier views, immaterialism was the key to disposing of religious scepticism; in *Alciphron* that is no longer the strategy (methodologically speaking), though that ultimate goal remains very much intact. I demonstrate the role that Locke's philosophy of language and epistemology play in these changes in a way that makes sense of Berkeley's continued preoccupation with the philosophical dangers of language. Here, I contrast my position with a recent account from Pearce (2017).⁶⁴ I supplement this analysis with appeals to Berkeley's other works of a similar period, particularly 'A Sermon Preached before the Incorporated Society for the Propagation of the Gospel in Foreign Parts' (1731) (*SIS*) and the surrounding correspondence. I also examine some of his earlier works, which, like *Alciphron*, connect various cultural and public changes, as he saw them, with a dire worry about the future of his society. I'm particularly interested in 'An Essay towards preventing the Ruin of Great Britain' (henceforth *Ruin GB*), first published in 1721.

Another change we see in the philosophy of *Alciphron* (when contrasting it with the philosophy of 1709-1713) is the outward looking nature of the philosophy and its focus on social benefit. The project of the early philosophy is about recasting the world through the lens of perception and rooting it in the mental. Berkeley concentrates on the metaphysics and epistemology of individual experience, and the plan for achieving his philosophical agenda involves individuals' reinterpreting their relationship with the world. The benefits of this project were thought to be certainty, anti-scepticism and theoretical parsimony. A further hope was to correct

of corporeal causes is replaced with a close pursuit of them; and yet other disparities are alleged. The assumption rests on an interpretation both of his early and of his late philosophy with which I am unable to agree. In *Siris* I can see a deep alteration of temper and a larger theatre of interest, but no *volte-face*; an excursion from his older doctrines, not a cancellation of them.' (*Siris*, 12, Jessop's Introduction) The agreement over the interpretative difficulty of *Siris* emphasises the importance of understanding Berkeley's philosophical position (with respect to his early work) in *Alciphron* and *Analyst*; they are the last significant works in which the lines to that early philosophy are still easily traceable (subsequent works like *The Querist*, *WTW* and *MIM* have little interest in empiricism at all), and, a 'larger theatre of interest', as Jessop put it, is already evident. My reading is that, by the philosophy of *Alciphron* and *The Analyst*, things have already shifted more significantly than is the popular opinion: the pragmatism I discuss later in this chapter makes unequivocal commitment to the metaphysical and epistemological radicalism of the earlier work a matter requiring more subtle treatment.

⁶⁴ 'Berkeley's Lockean Religious Epistemology'

the problems in the history of philosophy. In *Alciphron*, the philosophy is directed in a much more public way—Berkeley is advertising the connection between his ideas and public happiness and well-being. The key to intelligibility and living well is eventually to be found in a pragmatic theory of meaning, one grounded in context and public value.

In this chapter, I discuss the freethinkers Berkeley has as targets in *Alciphron*, paying attention to how these criticisms relate to previous parts of his philosophy. I begin with the account of freethinking that can be gleaned from his popular writing in the *Guardian*. I analyse the key features of the philosophy of *Alciphron* and some of his homiletic work that relate to his thinking on freethinkers and contemporary philosophy. I emphasise important developments in his thought—a move towards a deeper pragmatism than that already present in his earlier works, and a public-facing shift in his philosophy. At the end of the chapter, I discuss Berkeley’s connections to elements of the London literary scene, and argue that he was deeply influenced by his friends Alexander Pope and Jonathan Swift, and that these influences can be seen in the great literary flexibility with which he approached philosophical problems.

2.2

Berkeley and the Freethinkers

*Berkeley at the Guardian: ‘The Pineal Gland of a Free-thinker’,
‘Narrowness of Free-thinkers’ and ‘Happiness Obstructed by
Free-thinkers’*

The most interesting, and in my experience least discussed, source of Berkeley's early thinking on those he calls the 'minute philosophers'⁶⁵—the freethinkers—is the collection of short articles he wrote for Richard Steele's *Guardian*.⁶⁶ An excellent example, in which Berkeley gives an account and diagnosis of what he takes to be the typical freethinker, is 'The Pineal Gland of a Free-Thinker', published in the *Guardian* on April 25th, 1713. The central literary conceit of the essay is that the author has a correspondent ("Ulysses Cosmopolita") who has 'acquired the faculty of entering into other men's thoughts', from whom he is receiving a report about a recent trip to the pineal gland of Anthony Collins.⁶⁷ The report begins with a remark on the anatomical smallness of the understanding of the mind of the freethinker:

I repaired to the Grecian coffeehouse,⁶⁸ where, entering into the Pineal Gland of a certain eminent Free-thinker, I made directly to the highest part of it, which is the seat of the Understanding, expecting to find there a comprehensive knowledge of all things human and divine; but, to my no small astonishment, I found the place narrower than ordinary, insomuch that there was not any room for a miracle, prophecy, or separate spirit. (*Guardian*, 154)

This prefigures many of the sentiments Berkeley will go on to express in *Alciphron*, if more plainly. Although the freethinkers present their movement as cultured and

⁶⁵ Berkeley's well-known opinion on the name 'freethinker'—which is that it is far too generous—is given in *Alciphron*, in §10 of Dialogue I, prefaced as *Modern Free-thinkers more properly named Minute Philosophers*. Euphranor suggests they follow Tully's 'appellation' of the equivalent group of thinkers in his time: '[H]e calls them *Minute Philosophers*.' Crito then says: '[T]he modern free-thinkers are the very same with those Cicero called Minute Philosophers, which name admirably suits them, they being a sect which diminishes all the most valuable things, the thoughts, views, and hopes of men (...), human nature they contract and degrade to the narrow low standard of animal life, and assign us only a small pittance of time, instead of immortality.' After Alciphron responds indignantly to this description, Euphranor says: 'O *Alciphron*! These Minute Philosophers (since that is their true name) are a sort of pirates, who plunder all that come in their way. I consider myself as a man left stript and desolate on a bleak beach' (*Alciphron*, D1 §10).

⁶⁶ Though there was some uncertainty over the authorship of one of the *Guardian* articles (one formerly attributed to Berkeley is now thought to be Steele's), the three discussed in this section are uncontroversially regarded as Berkeley's. I discuss the Steele article and its authorship in my fifth chapter.

⁶⁷ The pineal gland, the point of contact between Cartesian matter and spirit, is further lampooned in another *Guardian* essay, 'A Visit to the Pineal Gland'. (*Guardian*, 147)

⁶⁸ O'Higgins discusses Collins and the Grecian Coffee House: 'By this time [1713] he was recognised as a deist and a freethinker, the centre of a group that met at the Grecian Coffee House near Temple Bar.' (O'Higgins, 1970, p. 12)

expansive (given their independent approach to the topics of philosophy and culture), they are actually narrow and bigoted in understanding and rationality because they have expressly deprived themselves of certain kinds of belief. The imagination of the freethinker is described in the following terms:

This obliged me to descend a story lower, into the Imagination, which I found larger, indeed, but cold and comfortless. I discovered Prejudice in the figure of a woman standing in a corner, with her eyes closed shut and her fore-fingers stuck in her ears; many words in a confused order, but spoken with great emphasis, issued from her mouth. (...) I could discern vast dungeons, and all about it lay scattered the bones of men. (...) I found a mob of Passions assembled in a riotous manner. Their tumultuary proceedings soon convinced me, that they affected a democracy. After much noise and wrangle, they at length all harkened to Vanity who proposed the raising of a great army of notions, which she offered to lead against all those dreadful phantoms in the imagination that had occasioned all this uproar. (*Guardian*, 154-155)⁶⁹

Thus, in the bloated imagination of the freethinker dwells a woman covering her eyes and ears and babbling nonsensically. Her perception that priests and churches are torturous, castle-guarding monsters has caused the emotions of the freethinker to gather around Vanity, and swell into an army to be led by her against the 'dreadful phantoms' of the freethinker's imaginative representation of the church. In *Alciphron*, Crito describes Alciphron and freethinkers generally as 'frightened at spectres of their own raising'. (*Alciphron*, D1 §4) On Berkeley's view, the freethinker misunderstands and fears the church. Though this work is directed at Collins, it might apply equally to Toland's writings on the public evils of priestcraft.⁷⁰ As to the content of the freethinker's "storehouse of ideas", Berkeley's agent gives the following list:

⁶⁹ This army of passions is to be led against the 'few innocent clergy' defending the church that the understanding of the freethinker has imagined as 'certain men in black, of gigantick size, and most terrible forms' defending 'a great castle with fortification case round it, and a tower adjoining to it that through the windows appeared to be filled with racks and halters'. (*Guardian*, 154-55)

⁷⁰ For discussion of Toland on priestcraft, see Wigelsworth (2009, 20-23). 'Toland identified such clerical actions as 'priestcraft' and assured his readers that it was this practice that he combatted and not religion itself, and he would frequently identify himself as a Protestant Dissenter. Purveyors of priestcraft, Toland explained, were supported by a certain political element which viewed deviation from orthodoxy as dangerous to the welfare of the nation, which was secured only through conformity.' (Wigelsworth, 2009, p. 21)

I beheld a great number of lifeless notions confusedly thrown together (...). Here were to be seen, among other odd things, sleeping deities,⁷¹ corporeal spirits, and worlds formed by chance; with an endless variety of heathen notions, the most irregular and grotesque imaginable. And with these were jumbled several of Christian extraction; but such was the dress and light they were put in, and their features were so distorted, that they looked little better than heathens. (*Guardian*, 155)

To Berkeley, the ideas of the freethinker are in a state of confusion, and their contents are a hodgepodge of both ostensibly religious and heretical notions. The version of religion that the freethinker recommends is, to Berkeley, distorted to the point of negating any actual sanctity. When the metaphorical army led by Vanity to attack the castle of the Church seems 'rather a confused rabble than a regular army', Berkeley's agent remarks 'I could, nevertheless, observe, that they all agreed in a squinting look, or cast of their eyes towards a certain person in a mask, who was placed in the centre, and whom by sure signs and tokens I discovered to be Atheism' (*Guardian*, 155).

Ultimately, according to Berkeley, the collective passions of the freethinker look to atheism for security, or, their attempts at religious reform terminate in a similar disposition. At the end of the report from Ulysses Cosmopolita, it is suggested more explicitly that the freethinker in question is Anthony Collins (or at least someone who shared his ideas), since the very same 'representations' and 'notions' were found on the pages of *A Discourse of Free-thinking* (1713),⁷² as had been encountered in the journey into the mind previously described.

Berkeley uses this report to form the basis of a diagnosis and treatment-plan for what he takes to be an increasingly prevalent public ailment. Berkeley's recommendations focus primarily on regulating and suppressing the vanity: 'I advise whoever undertakes the reformation of a modern Free-thinker, that above all things to be careful to subdue his vanity' (*Guardian*, 156). Berkeley's belief that the vanity is a central obstacle between the freethinker and wellness (following his

⁷¹ Presumably, this is a reference to the materialistic picture lampooned by Berkeley as a world created and abandoned by God.

⁷² Collins's book had been reviewed in a previous article in the *Guardian*. This article was attributed to Berkeley by Fraser, and is included his edition of the Berkeley's *Works* (Volume III, 1871). It is now thought to have been written by Steele himself.

metaphor) is reiterated in *Alciphron* a number of times. When discussing the freethinker Alciphron's claims about the obscurity and difficulty of parts of scripture, Berkeley's Euphranor urges modesty:

May we not also suppose from the reason of things, and the analogy of nature, that some points, which might otherwise have been more clearly explained, were left obscure merely to encourage our *diligence* and *modesty*? Two virtues, which, if it might not seem disrespectful to such great men, I would recommend to the minute philosophers. (*Alciphron*, D6 §8 (my italics))

If the subject's vanity is difficult to conquer, Berkeley offers a strategy appropriate to that particular failing. He recommends an *argumentum ad vericundiam*⁷³ (argument from authority) on the grounds that it may be possible to entice a robust vanity by appealing to the fact that 'the greatest *genii* of the age have a respect for things sacred.'⁷⁴ This may sway the freethinker as he will be keen to keep in the company (and in line with the habits) of the great thinkers of the time.⁷⁵

In a later article in the *Guardian*, 'Narrowness of Free-thinkers', he considers the sect and their beliefs against the backdrop of the Christian Church. Comparing the design and architecture of St Paul's Cathedral to the fabric of the church, he opens with a statement of the ultimate value of both, claiming that they share the 'same design, and with an admirable concurrence tending to one view, the happiness and exaltation of human nature' (*Guardian*, 173). This practical element is what the freethinker, in his minute approach, misses in his evaluation:

The thoughts of a Free-thinker are employed on certain minute particularities of religion, the difficulty of a single text, or the unaccountableness of some step of Providence or point of doctrine to

⁷³ I discuss Berkeley's awareness of Locke's division between content and context arguments in Chapter 5. In his writing on reasoned argument, Locke identifies 'four sorts of argument' that appeal to argumentative context rather than content. (*Essay*, IV xvii §19) An arguer may use these four to press his opponent or shift the burden of proof. *Argumentum ad hominem* and *argumentum ad vericundiam* are two of the four mentioned, and it is interesting to see Berkeley promoting the use of this other rhetorical device for the purposes of engaging with freethinkers.

⁷⁴ In *Alciphron*, Crito appeals to Newton's religiosity—claiming him for the cause and citing his 'perfect contempt of all those celebrated rivals' (*Alciphron*, D6 §22). The religious belief of Locke, Boyle and Bacon are also proclaimed. This reference is another confirming instance of Berkeley's regard for Newton as a thinker.

⁷⁵ I typically use the male singular for the freethinker since it facilitates a consistency of person between my own description and quotations from Berkeley.

his narrow faculties, without comprehending the scope and design of Christianity, the perfection to which it raiseth human nature, the light it hath shed abroad in the world, and the close connection it hath as well with the good of public societies as with that of particular persons. (*Guardian*, 173)

The freethinker is compared to a fly in St Paul's Cathedral, who cannot appreciate the scope or beauty of the broader project because of his limited viewpoint. Berkeley's claim that the freethinker is obsessed with the coherence of doctrinal minutiae is echoed in the sixth dialogue of *Alciphron* where the freethinkers jump from point to point, barely considering the connections and relative persuasiveness of the objections.⁷⁶ When Berkeley muses over what kind of learning might liberate the freethinker from their limitations, or encourage the right kind of breadth of outlook, he suggests philosophy would help the freethinker to see beyond the scope and triviality of certain minute problems. Of the sciences, astronomy is 'particularly adapted to remedy a little and narrow spirit' and might remind the freethinker of the more holistic nature of things and the limitation of individualistic perspectives. 'These ideas wonderfully dilate and expand the mind.' (*Guardian*, 174)

However, to Berkeley, it is the Christian religion itself that is the surest remedy: 'Philosophy increaseth our views in every respect, but Christianity extends them to a degree beyond the light of nature' (*Guardian*, 175). This is ventured in conjunction with the confession that what really causes indignation in Berkeley is the freethinker's claim that it is the traditional Christian believer who is always intellectually narrow. It's not clear who he has in mind here (though, this more frivolous claim would certainly be found in the mouth of Lysicles⁷⁷ rather than Alciphron in *Alciphron*). For Berkeley, the agent whose actions are always directed

⁷⁶ Naturally, this is deeply unfair to most of the most obvious candidates. Collins and Toland work through their subject matter systematically and thoughtfully. Shaftesbury is certainly deeply motivated by the idea that philosophy should help people live better, and though Mandeville is satirical in discussing subjects Berkeley wants handled with seriousness, most of the best known freethinkers are very gentle with believers of Christianity. Deslandes, writing for a more liberal French audience (and, subject of a previous essay), may be a more natural target for Berkeley, but I struggle to find anything in *A Philological Essay* to suggest attribution of narrowness to Christians.

⁷⁷ See (Stoneham T. , p. (ms)) for discussion of Berkeley's didactic usage of the Lysicles character in *Alciphron*. I engage with this work directly in the next section.

at the pleasure of an omnipotent, omniscient God (and contextualised in that plan) is much broader and deeper. The Christian's conception of the natural world, according to Berkeley, enjoys the same enriching, relative to the rival pictures. As astronomy may teach the freethinker about scope and the triviality of the minute, Christianity, according to Berkeley, gives the freethinker a way of seeing everything as connected to something of untouchable significance and scale.

The *Guardian* articles give us a sense of Berkeley's early feelings about his freethinking opponents. In summary, though they pride themselves on their rationality, they have more imagination than reason, and their ideas are a confused mix of sacred and secular. Their weakness is vanity, and a feeling that they are the most cultivated,⁷⁸ since they challenge orthodoxy and, by their own lights, take nothing on trust or authority.⁷⁹ Though his diagnosis takes place within a piece of satirical writing, the recommendations should be taken seriously, especially since they reappear in various parts of *Alciphron*. Those recommendations are: to read more philosophy; to cultivate a more nuanced understanding of logic; to tame and discipline one's intellectual vanity; and, to read Christian doctrine in a holistic way that takes the global system and its intended outcomes as primary.

It is noteworthy that even in this earlier, less homiletic work he advocates for religious belief primarily on the grounds of its benefit to believers. Importantly, this is typically not done with forensic notions of divine punishment and reward at the forefront. In most instances, Berkeley advocates for Christianity on the grounds that it is best for society and public well-being. Naturally, the two are related for Berkeley, and he believes that it is the regulation of the will and the 'noble pursuit [of the] assimilation of himself to the deity, which is the proper employment of every Christian' that improves society by altering public activity towards a shared end. In the other direction, we can presume that he sees a happy, well-functioning society as essential for the securing of an afterlife, which must ultimately be the

⁷⁸ In 'Happiness Obstructed by Free-thinkers' he describes their sense of their values as follows: 'Liberty and truth are the main points which these gentlemen pretend to have in view (...). [U]nder the pretence of advancing liberty and truth, they do in reality promote the two contrary evils'. (*Guardian*, 180)

⁷⁹ This idea is seriously challenged in *The Analyst*, where one of the central claims is that the freethinkers begrudge faith and revelation in religious believers, but tolerate and even enact an equivalent deference for leaders in their preferred fields.

goal of a man of the church. Yet, it is interesting how often he focuses on the betterment of society in the present. Also, as he mentions above, human goodness delights God. In a later essay, 'Happiness Obstructed by Free-thinkers' this kind of social utilitarianism is at the forefront:

I have in a late paper observed, that men who have no reach of thought do oft misplace their affections on the means, without respect to the end, and by a preposterous desire of things in themselves indifferent forego the enjoyment of that happiness which those things are instrumental to obtain. (*Guardian*, 180)

Let us then respect the Happiness of our species, and in this light examine the proceedings of the Free-thinkers. From what giants and monsters would these knight-errants undertake to free the world? (*Guardian*, 181)

Is it of any use to the public that good men should lose the comfortable prospect of a reward to their virtue, or the wicked be encouraged to persist in their impiety, from an assurance they shall not be punished for it hereafter. (*Guardian*, 181)

As is clear, Berkeley was deeply pessimistic about the ability of traditional morality to withstand the consequences of the kind of 'liberty and truth' advocated by the freethinkers. This was especially so in instances where freethinkers sought to apply rules designed for scientific and mathematical disciplines to theology, in order to challenge (or, in some instances, to try to improve) the rational respectability of traditional theology.

Understanding Alciphron

Berkeley's correspondences just prior to leaving America provide us with an invaluable insight into his thinking at that time. He wrote to Percival about the failure of the Bermuda project:

I have received such accounts on all hands from both England and Ireland that I now give up all hopes of executing the design which brought me into these parts. I am fairly given to understand that the money will never be paid. And this long continued delay and discountenance hath (...) made those persons who engaged with me

entirely give up on all thoughts of the college and turn themselves to other views. So that I am absolutely abandoned by every one of them. This disappointment which long lay heavy upon my spirits I endeavour to make myself easy under by considering that we cannot know the times and the seasons of Providence (...). Upon the whole my thoughts are now settled towards Europe, where I shall endeavour to be useful some other way.

What they foolishly call free thinking seems to me the principal root or source not only of opposition to our College but of most other evils in this age, and as long as that frenzy subsists and spreads, it is vain to hope for any good either to the mother country or colonies, which always follow the fashions of Old England. (Hight, 2012, p. 336)

As a despairing Berkeley departs America, there are two predominant thoughts: 1) he is looking to make himself useful with new projects in Europe, and 2) he regards the failure of the College project as intimately linked to the increasing popularity of freethinking, which he sees as the cause of most of the evils of the age.

Berkeley's traditionalism and orthodoxy on religious matters is particularly interesting given his enthusiasm for the new philosophy (and strong opinions on the blunders and ailments of scholastic philosophy)⁸⁰ and desire to reconcile his own philosophy with the emerging new science.⁸¹ If, like Jonathan Israel, we view the 'Radical Enlightenment'⁸² as concerned with movement towards 'democracy; racial and sexual equality; individual liberty of lifestyle; full freedom of thought, expression, and the press; eradication of religious authority from the legislative process and education; and full separation of church and state' (Israel, 2010, pp. vii-viii), it is clear that Berkeley is squarely in the 'unenlightened' conservative corner.

In the earliest literature on the Radical Enlightenment as such, the story is very much cast in terms of the activities of freethinkers. In *Deism and Enlightenment England*, Jeffrey Wigelsworth describes the scholarship on this

⁸⁰ He described scholastic philosophy as having 'corrupted philosophy for so many ages like some dire plague' (*De Motu*, §40).

⁸¹ This admiration for the new science is balanced against an anti-sceptical (as he believed) desire to ensure that the new science not be used to make people believe that 'how things really are' (i.e. as seen at the level exhibited by microscopes) is more real or actual than the version of events given in natural perception. This is clearest in the *NTV* and *De Motu*.

⁸² See Israel (2010).

radical strain of Enlightenment as originating in Jacob's work on freethinking.⁸³ David Berman notes a related Counter-Enlightenment in the Irish philosophy of 1690—1750:

The primary impulse of philosophy in Ireland is theological: its character and growth being constituted by the so-called Deist controversy and the play of Enlightenment and Counter-Enlightenment forces (...). Irish philosophy produced works and ideas of considerable originality, influence and value. It also found more lasting expression in the more popular literature of the period, notably in the writings of Jonathan Swift. (Berman D. , 1982, p. 5)

Berkeley was very much a part of the conservative Enlightenment (or Irish Counter-Enlightenment) that marked the majority intellectual culture of his period and geography.⁸⁴ He uses the term freethinker broadly, but it particularly encompasses those attempting to reform the church in line with (radical) Enlightenment values and (radical) Enlightenment science.⁸⁵

2.3

Alciphron's Freethinkers

⁸³ He has in mind *The Newtonians and the English Revolution, 1689-1720* (1976) and *The Radical Enlightenment* (2003), in which Jacob argues that freethinkers challenged a political establishment supported by Newtonian science and the church.

⁸⁴ Wigelsworth: '[I]n more recent accounts of English Enlightenment deists are portrayed as existing in opposition to the conservative establishment. John Redwood, in one of the first books that adopted the concept of an English Enlightenment, claimed that deists were unable to mount an effective challenge to monarchs and church and could only hurl ridiculing insults at that which they hoped to topple. (...) Israel takes the position that deists existed in a 'Radical Enlightenment' that contained the ideals that we have traditionally associated with the Enlightenment in general and that the radicals were opposed to what he calls the 'Conservative Enlightenment', composed of the individuals whom we usually see as defining Enlightenment, such as John Locke and Isaac Newton. Conservatives defended church and crown and all the trappings of the establishment while radicals sought to topple the establishment and champion human freedom and toleration of differences.' (Wigelsworth, 2009, p. 4)

⁸⁵ This includes people whose motivations are diverse. 'Free-thinker', for Berkeley, could apply to an outright atheist, as well as one motivated by the perceived shortcomings of the rational respectability of the church in an age of increasing attention and devotion to rationality.

It is natural to begin an account of certain aspects of *Alciphron* by attempting to deal with the issue of who the 'Alciphron' or 'Minute Philosopher' is. The two characters offering freethinking arguments in the text—Alciphron and Lysicles—are said by Jaffro and Brykman to represent the views of Shaftesbury and Mandeville respectively. (Berkeley, Jaffro, Brykman, & Schwartz, 2010, p. 10) Jaffro and Brykman also acknowledge in the same breath that there are so many different lines of argument given in the course of the dialogues that these characters must, at different times, represent more contemporary voices than just their primary inspirations.⁸⁶

Berkeley undoubtedly believes the freethinkers to be misguided in their arguments generally, so the prospect of having the freethinking characters jump from arguments of one kind to another (without much regard for their mutual consistency) would serve his purpose well enough, particularly since he presses them for consistency (*e.g.* *Alciphron* D1, §16: 'This conclusion you have been led to by your own concessions'). Of the central difference between Alciphron and Lysicles, I think Berman captures things precisely when he suggests that it is their degree of intellectual seriousness which distinguishes them:

More problematic are Alciphron and Lysicles, the critics of religion, because they are spokesmen for a wide variety of freethinkers, some of who—notably Shaftesbury and Mandeville—were largely opposed to each other. On the whole, however, Alciphron is the more sober philosopher, the defender of Shaftesbury and Collins; whereas Lysicles is the flightier figure,⁸⁷ the man of pleasure, who defends Mandeville. (Berman D. , 1993, p. 10)

This seriousness contrast is also manifest in Stoneham's discussion of Lysicles' philosophical 'unreasonableness' and the unusual fact that Lysicles is never ultimately convinced in the dialogue—'he leaves the dialogue as unreasonable as

⁸⁶ 'Alciphron and Lysicles – though the former is obviously a disciple of Shaftesbury, and the latter specifically represents Mandeville – turn everything to account and borrow their arguments from a whole range of theoretical libertines, from Hobbes to Collins, through Spinoza, Toland, *et alii.*' (Berkeley, Jaffro, Brykman, & Schwartz, p. 10 Introduction)

⁸⁷ The reader's introduction to Lysicles is via his laughing at an earnest suggestion of Euphranor's.

he enters it.’⁸⁸ (Stoneham T. , p. (ms) 1) This is in contrast with Alciphron, who ‘end[s] up, like Hylas before him, shaken in his beliefs.’ (Stoneham T. , p. (ms) 4) Berman also acknowledges that this picture is made more complicated by the fact that Berkeley is not simply relying on the published views of the authors in question, but appealing to their ‘hidden esoteric positions’. (Berman D. , 1993, p. 10) We probably differ on how entitled Berkeley is in doing so, given that (as Berman acknowledges) Berkeley’s Shaftesbury and the Shaftesbury of the *Characteristics* disagree significantly.⁸⁹

Further, Berkeley’s presentation of Mandeville’s *Fable of the Bees* material (in the second dialogue) significantly misrepresents Mandeville’s actual recommendations and ignores a number of instances where he clarifies his intentions for the text.⁹⁰ There can be no doubt that Berkeley thought that many of the freethinkers insincerely represented themselves as theists so as to better position them to influence the undecided. This might explain why he exploits similarly misrepresentative tactics for similar reasons. Just as the freethinker sought to capitalise on positive public dispositions towards traditionalism, Berkeley sought to capitalise on public anxiety over widespread vice and explicit atheism.

However, it is of utmost importance to acknowledge that Berkeley is a particularly unfair guide to the views of the people represented. Alciphron and Lysicles variously represent some views of: Bernard Mandeville, the 3rd Earl of Shaftesbury, Anthony Collins, John Toland, Francis Hutcheson, Matthew Tindal, and probably more. The sheer mathematics of this mean that neither character is likely to hold a consistent set of views. Responses at the time (especially Mandeville’s in *A Letter to Dion*) acknowledge the selective and hyperbolic presentations given of freethinking views in *Alciphron*.⁹¹ In my discussions of Berkeley’s particular

⁸⁸ This situation does seem particularly noteworthy given that *Alciphron* is an apology. In a defence of Anglican theology, we might well expect the narrative to run such that both objectors leave changed and redeemed.

⁸⁹ See Berman (1993, pp. 10-11).

⁹⁰ For Mandeville’s views on the misrepresentation, see *A Letter to Dion*, first published in 1732 (Mandeville B. , 1953). For Mandeville’s clarifications of his view (in response to other criticism) see *A Vindication of the Book*, added in 1724, and ‘The Preface’ and ‘The Introduction’ of the 1741 edition (Mandeville & Harth, 1989).

⁹¹ See also Stoneham’s discussion of Berkeley’s handling of what are assumed to be Shaftesbury’s views on ridicule. (Stoneham T. , p. 11)

arguments against the freethinkers, I focus on his representation of the arguments, but try to note the limitations of that presentation.

On the matter of the personages of Crito and Euphranor, things are somewhat less complicated, at least numerically speaking. Crito represents traditional Christianity, and offers the orthodox views of the Anglican Church. Euphranor is Berkeley, or speaks for Berkeley; like Philonous in the *Dialogues* he is the character representing the author's philosophical views.

However, one might wonder, to what extent should we see the views of dialogue interlocutors as the representations of philosophical views in any straightforward sense. Surely, dialogue form represents particular complexities in this light, given the license it provides to set argumentative content in highly artificial literary context. Stoneham notes this need for caution in work on both the *Dialogues* and *Alciphron*:

Even if Berkeley had chosen to base his dialogues exclusively on real people, places, and events, their roles within the dialogues would be completely determined by what was written about them. If we are fully to understand this work of fiction written by a philosopher, we need to be explicit in recognizing its fictional elements. (Stoneham T. , 2002, p. 17)

The method [a species of doxography] seems particularly appropriate when a philosopher chooses to express his views by writing fiction, and *Alciphron*, being a dialogue, is a work of fiction as well as a work of philosophy. (Stoneham T. , p. (ms) 3)

This explains naturally why Stoneham might be reluctant to acknowledge Euphranor as a Berkeley surrogate in an unqualified way.⁹² I find the case that Euphranor represents Berkeley's philosophical outlook very convincing. Of course, I am also happy to qualify this to a certain extent. As suits the dialogue style, it is natural to expect that an author may present the protagonist as more neutral, perhaps more naïve, and more indecisive than might suit another narrative form. After all, a narrative of persuasion is much more effective (and convincing) if it appears that the parties are open to the discussion developing in any direction; a

⁹² Stoneham does qualify the interpretation of Euphranor as Berkeley: '[T]he character Euphranor, who is to some extent Berkeley's mouthpiece, quickly ties religious to moral duties (...). (Stoneham T. , p. 1)

fair fight is one that either could win in principles. For this reason, it would be wrong to attribute to Berkeley dialogical statements of neutrality or uncertainty (for example, when Euphranor seems never to have heard of freethinking at the beginning of the first dialogue, when we know well that Berkeley has). However, in the positive arguments and in the statement of conclusions which Euphranor attempts to persuade his colleagues, I think we should read these as statements of Berkeley's philosophical outlook—at least insofar as it represents his views relative to the issues at hand (*i.e.* freethinking and how to temper its popularity).

The best evidence for this is the enormous consistency between Euphranor's positions and Berkeley's well known (and in many cases esoteric) positions. Euphranor's brief references to visual theory, inference from visual language to a divine intelligence, and, rejection of abstract general ideas are all quintessentially Berkeleyan positions. They are by no means the focus of the work—indeed, it's important to my account that these issues have been largely relegated to side issues in *Alciphron*—but the continuity is important.

Further, and I think more importantly, the continuity and back-referencing to Euphranor's arguments in the later prescriptive works, *MIM* and *WTW*, is striking. In 'A Discourse addressed to Magistrates and Men in Authority', Berkeley refers back to *Alciphron* in making points about the unsuitability of freethinking theory to a moral life (Berkeley & Sampson, pp. 181-182); here, he references the third and fourth dialogues. In discussing his view on 'the general good of mankind being the rule or measure of moral truth' (Berkeley & Sampson, p. 184) he directs the reader to the first dialogue, §16, where Euphranor makes the same case. In 'A Word to the Wise', the emphasis on the role of religion in the promotion of the public good, emphasis on public favour, and the pragmatism of Berkeley's urging the Catholic clergy to remind the flock of the pope's recent commercial projects are reminiscent of Euphranor's thought in *Alciphron*.

Returning to the freethinking antagonists, we may consider *Alciphron's* prologue. Berkeley describes the project as one investigating the various presentations of the freethinker as 'atheist, libertine, enthusiast, scorner, critic, metaphysician, fatalist, and sceptic' (*Alciphron*, Advertisement). In the same advertisement, he decries 'raillery' on serious matters (advocated by Shaftesbury

in *Essay on the Freedom of Wit and Humour*).⁹³ My sense of the inclusion of this point in the advertisement is that Berkeley wants to immediately disabuse the reader of the idea that frivolous, satirical or whimsical treatments of these issues should be immune from criticism. It's clear from *Alciphron*, and also from various articles in the *Guardian*, that he thought freethinking as it occurred in the public sphere and in unserious written treatments was potentially more insidious than those accounts given in careful scholarship. Further, based on his approach to freethinking philosophy in the *Guardian* articles (and in *The Analyst*, as I claim in the fourth chapter), we know he thought satire was an effective way to do philosophy and convince readers of philosophical ends.

To witness his anxiety over public freethinking and intellectual infidelity at fever pitch, one only needs to look to his recommendations for their treatment in *Ruin GB* (1721):

[W]hatever conduct common sense, as well as Christian charity, obligeth us to use towards those who differ from us in some points of religion, yet the public safety requireth that the avowed contemners of all religion should be severely chastised; and perhaps it may be no easy matter to assign a good reason why blasphemy against God should not be inquired into, and punished with the same rigour as treason against the king.

For though we may attempt to patch up our affairs, yet it will be to no purpose; the finger of God will unravel all our vain projects, and make them snares to draw us into greater calamities, if we do not reform that scandalous libertinism which (whatever shallow men may think) is our worst symptom and the surest prognostic of our ruin. (*Ruin GB*, 70-71)

His despair over the state of things in that essay is palpable. The coincidence of this public crisis of infidelity, as he saw it, with the South Sea Bubble's economic impact meant that Berkeley was deeply anxious about region's future prospects. 'The truth is, our symptoms are so bad that, notwithstanding all the care and vigilance of the legislature, it is to be feared the final period of our State approaches.' (*Ruin GB*, 84-58)

⁹³ This is Shaftesbury's terminology in *Essay of the Freedom of Wit and Humour*. Berkeley refers to a 'certain admired writer' who believed virtue 'likely to suffer less from its witty antagonists, than from its tender nurses (...)' (*Alciphron*, Advertisement).

Often, the centrality of the religious objective in the metaphysics of the *Principles* and the *Dialogues* is underestimated, and it can make the philosophy of *Alciphron* look like more of an ideological departure than it is. One needn't look far to see how fundamental the anti-sceptical project was to Berkeley's early work. The *Dialogues* has the following full title:

Three Dialogues between Hylas and Philonous: The design of which is plainly to demonstrate the reality and perfection of human knowledge. The incorporeal nature of the soul, and the immediate providence of a Deity: in opposition to Sceptics and Atheists. Also to open a method for rendering the Sciences more easy, useful and compendious. (*Dialogues*, Title)

Where metaphysics and epistemology (and Berkeley's radical empiricism more generally) were once the tool Berkeley regarded as best suited to the achievement of his religious goals, in *Alciphron* we see a considerable movement. On my account, pragmatic semantics and instrumental social philosophy are the new priority for Berkeley. In the next section, I look to the overarching philosophy of *Alciphron*, focusing on key themes that impact my reading of *The Analyst*. Beyond the obvious goal of refuting various freethinking and deist arguments against Christianity as traditionally practiced (as presented by characters in the dialogues), what philosophical viewpoint emerges in the course of *Alciphron*? The discussion of meaning in Dialogue 7 is of vital importance to my interpretation of Berkeley's position on calculus in *The Analyst*; it is also important to my account that the *Alciphron* presentation constitutes a ratcheting up of Berkeley's pragmatism (as compared with that presented in the philosophy prior to the 1730s).

Berkeley's use of 'infinitesimal' as an explicit exemplar of a concept that earns its intelligibility in use and practice is also crucial for my purposes. And, his comparison of it to the Holy Trinity and other problematic religious items (grace, original sin, etc.), in terms of their definitional problems, is emblematic of this pragmatic approach to philosophy, and his rejection of the freethinkers' methodology.

2.4

Against Speculative Philosophy: Berkeley's Anti-Theoretical *Alciphron* Philosophy

A Caveat Concerning Proto-Pragmatism

In the analysis that follows, I have chosen the lens of proto-pragmatism to analyse the linguistic theory and philosophy of *Alciphron VII*. Williford discusses his worries about this kind of project, but has as his focus the emotive theories he finds in Belfrage (1986) (1987, p. Editor's Introduction), Berman (1994) and Brykman (1993):

Although there is nothing wrong in principle with the careful use of relatively recent philosophical terminology for the purposes of succinctly characterizing the texts of past philosophers, the practice is dangerous. The question in the case at hand is this: have influential commentators, in ascribing to Berkeley a theory of emotive meaning, anachronistically likened his view, on the basis of superficial similarities, to a twentieth-century semantic doctrine and thus tucked the Good Bishop into a procrustean bed? (Williford K. , 2003, p. 274)

One might well worry that the same concern must pervade my account and my attempt to link the thought in *Alciphron* Dialogue 7 to pragmatism (even though I acknowledge it must of course be a proto-pragmatism, if anything). This is an important difficulty in the history of philosophy, and one that this thesis must address.⁹⁴ Where possible (particularly in my discussion of ad hominem arguments in chapter 5), I try to avoid anachronism by exploring terminology and argumentative convention in the period in question. Where there are relevant anachronistic features, I try to show which ones we need to worry about. I also am keen to emphasise the different motivations and variety of approaches offered by the early pragmatists, and to be clear that there is no one monolithic view that answers to the term 'pragmatism'.

I worry about an approach to history of philosophy that is intent on casting early modern content in twentieth century moulds. I particularly worry about this

⁹⁴ I have found Pearce's discussion of these issues in his Aims and Methodology section of his monograph very instructive and it has guided my own approach significantly.

in the case of discussions of truth and meaning in early modern philosophy. I think it can be ill-advised to suppose that early modern philosophers saw the relations between language, truth and metaphysics the way we do now. And, I think Berkeley is a particularly troubling case, since I do not think he has a particular theory of truth in anything like the modern sense. However, systematic study of the philosophy of language becomes a proper discipline admitting of comparative accounts and more substantial theories in the late nineteenth and early twentieth centuries, and thus systematic study of earlier philosophy of language will be impacted by this fact (particularly where language is so central to the work of a particular philosopher).

I find the pragmatist approach to be very instructive in Berkeley's case. I do and have always understood Berkeley's use of 'operative' (in the sense it is drawn on by philosophers who study Berkeley's work on meaning) as a proto-pragmatist principle. This is so especially given its frequent conjunction with ideas of the good and practical benefit. I draw comparisons between the views of the American pragmatists and Berkeley's language in explaining his own view because I find it extraordinary how close the language is and how similar the goals are. In what follows, I lean heavily on that pragmatist material, because I believe it sheds light on Berkeley's outlook, and connects him to a tradition that seems to operate in a similar manner. I don't think we should suppose that Berkeley's outlook is anything like that of a modern pragmatist (though again I want to emphasise the variety existing in pragmatist philosophy), but in those early writings by the pragmatists about what matters, and what is meaningful, and when we should dig in our heels and argue and when we should not, I see Berkeley everywhere. In the following section, I highlight the parts of *Alciphron* that encourage this proto-pragmatist, anti-speculative reading.

'Barren Speculation'

In *Alciphron*, Berkeley's long-held distaste for the reverence of 'barren speculation' (*SIS* p132, *Alciphron* D7 §18) over more applied and practical concerns is at its most vociferous. In *Alciphron*, I contend, we see what was previously a tertiary issue become a core principle. For example, in his early philosophy, we find that well-known criticism of the philosophical salience of abstract general ideas. Berkeley acknowledges that it is not just their very nature (abstract general ideas) that is problematic, but their constant exaltation above what Berkeley takes to be their ostensible ends. This frustration over the tendency of philosophers to focus too much on the abstract and purely speculative version of things is long held, and is visible in the opening sentences of the *Dialogues*:

Though it seems the general opinion of the world, no less than the design of Nature and Providence, that the end of speculation be practice or the improvement and regulation of our lives and actions; yet those, who are most addicted to speculative studies, seem as generally of another mind. (*Dialogues*, 167)

Here we see Berkeley talk of focus on the speculative as a kind of academic malady or perversion from true philosophical purpose.⁹⁵ Indeed, there is a discernible trajectory of this kind of pragmatist emphasis in Berkeley's philosophy. It is the same point he seems to have drawn from Bacon's tennis analogy early on—yes, tennis is good in that it trains various systems of the body effectively, but the ends of such improvement should not just be more tennis. Looking at Berkeley's correspondences from around the same time, his choice to emphasise his commitment to focus on the practical is perhaps particularly understandable given the criticism of the *Principles* that Percival reports back to him from London. In a letter of 1710, Percival summarises what he has learned of the reactions (of Samuel Clarke and William Whiston) to Berkeley's early work.

There are here two clergymen who have perused your last book, Dr. Clarke, and Mr. Whiston, both deservedly esteemed men of excellent

⁹⁵ An interesting modern assessment of this tendency in philosophy is found in the writings of the pragmatist jurist Oliver Wendell Holmes. 'Man is like a strawberry plant, the shoots that he throws out take root and become independent centres. And one illustration of the tendency is the transformation of means into ends. A man begins a pursuit as a means of keeping alive—he ends by following it at the cost of life. (...) Philosophy as a fellow once said to me is only thinking. Thinking is an instrument to the adjustment of the conditions of life—but it becomes an end in itself.' (Holmes, 1992, p. 105)

learning, though the last is a little different from the orthodox in some points, inclining as it is said to Arianism. Not having and acquaintance with these gentlemen I can only report to you by second hand that they think you a fair arguer, and a clear writer, but they say your first principles you lay down are false. They look on you as an extraordinary genius, and profess a value for you, but say they wished you had employed your thoughts less on metaphysics, ranking you with Father Malebranche, Norris, and another whose name I have forgot, all whom they think extraordinary men, but of a particular turn, and their labours of little use to mankind for their abstruseness. (Hight, 2012, p. 47)

Given that they offer little by way of substantial or technical criticism—at least, such that it is available to Berkeley—it is unsurprising that Berkeley latched on to the only part of Percival’s report which offers some specific comment.⁹⁶ The clergymen, Berkeley is told, lament that the book is abstruse, and in being so, can produce little use for mankind. Berkeley’s response to this letter from Percival draws on the comparison with Malebranche and Norris, saying:

As to what is said of ranking me with Father Malebranche and Mr. Norris, whose writings are thought too fine spun to be of any great use to mankind, I have this to answer: that I think the notions I embrace are not in the least coincident with, or agreeing with, theirs, but indeed plainly inconsistent with them in the main points, insomuch that I know few writers whom I take myself at bottom to differ more from than them. Fine spun metaphysics are what I on all occasions declare against, and if anyone shall show me anything of that sort in my *Treatise* I will willingly correct it. (Hight, 2012, p. 49)

These correspondences make sense of Berkeley’s decision to frame the *Dialogues* as he did.

Berkeley’s anti theoretic bent reaches its crescendo in the sweeping account of meaning given in Dialogue 7. That part of *Alciphron* will be explored in detail, but I want to note some of the other pragmatist elements of the text that show that this approach had moved to the very centre of Berkeley’s thinking, constituting an important departure from the earlier philosophical approach.

⁹⁶ Berkeley did pursue a more serious correspondence with Clarke, but Clarke could not be convinced. Berkeley was disappointed with this response, remarking that ‘Dr. Clarke’s conduct seems a little surprising. That an ingenious and candid person (as I take him to be) should declare I am in error, and at the same time out of modesty refuse to show me where it lies, is something unaccountable.’ (Hight, 2012, p. 53)

A first suggestion of the practice-focused philosophy to come may be in Berkeley's choice of the name 'Euphranor' for the character defending his own philosophical ideas. This had initially puzzled me, since usually Berkeley's choice of character names requires a limited amount of research, and information on the ancient Euphranor is markedly scant. 'Ulysses Cosmopolita' makes sense as a choice of name to juxtapose the (in Berkeley's view) mundane ideas of the freethinker with the epic traveller imagery conjured by the Ulysses reference. 'Eubulus' is the name he used in writing to the Dublin Journal, advising against the combat impracticality and unnecessary cost of dressing military personnel in ornately adorned regalia (rather than dressing them as sailors, which he advises). The choice of name is apt since the ancient Eubulus was an Athenian statesman renowned for managing public finances and freeing up military money to increase the budget available for public works projects. In the *Dialogues* 'Philonous' ("lover of mind") creates an eminent contrast with the mundane 'Hylas' ("matter").

The Euphranor of ancient history is primarily known for having been both a painter and a sculptor in a time where few artists were skilled in both techniques. The narrator (Dion) of *Alciphron* introduces us to Euphranor (and in choosing that name I think Berkeley asks us to focus on some duality of personae) by remarking that he 'unites in his own person the philosopher and farmer: two characters not so inconsistent in nature as by custom they seem to be.' (*Alciphron*, D1 §1) This must be to emphasise at the outset that the protagonist is a man of philosophy *and* a man of the world—a member of commercial society, a practical person.⁹⁷

Late in the first dialogue there is a revealing discussion of truth that sets the pragmatist tone for the rest of the work. Following Alciphron's claim that he has much left to prove in the current debate (over the naturalness of religion and religious differences across regions), Euphranor gives the following response, hinting at what he will take to be a key principle moving forward:

⁹⁷ The farmer embodies the antithesis of 'barren speculation' (in fact, if one really wanted to dig into the metaphor, 'fertile' is a literal antonym of 'barren'), tackling the problems of philosophy in the field: 'He is of the opinion that he could not carry on his studies with more advantage in the closet than in the field, where his mind is seldom idle while he prunes the trees, follows the plough, or looks after his flocks.' (*Alciphron*, D1 §1)

O *Alciphron*! I do not doubt your faculty of proving. But before I put you to the trouble of any farther proofs, I should be glad to know whether the notions of your minute philosophy are worth proving. I mean, whether they are of use and service to mankind. (*Alciphron*, D1 §15)

This discussion continues into the next section, and Berkeley's Euphranor explores the relation between a theory's being provable, and its being valuable to people. Alciphron originally resists any kind of close relation, by first distinguishing between things which 'may be useful to one man's views, and not another's' and then by rejecting the idea that truth can be in any way reduced to convenience for men. Euphranor replies: 'But is not the general good of mankind to be regarded as a rule or measure of moral truths, of all such truths, as direct or influence the moral actions of men?' (*Alciphron*, D1 §16)⁹⁸ It seems that Berkeley here endorses the idea that on all views related to action and morality, public utility can determine truth.

A similar style of thinking is to be found in subsequent work, when, in *MIM*, where Berkeley advocates for the active 'prejudicing' of people with religious notions on grounds that good ends should supersede rational means where benefit to society is concerned:

There must, therefore, of necessity, in every state, be a certain system of salutary notions, a prevailing set of opinions, acquired either by private reason and reflection, or taught and instilled by the general reason of the public; that is, by the law of the land. (...) Nor will it be any objection to say that these are prejudices; inasmuch as they are neither less useful nor less true, although their proofs may not be understood by men. (...) Prejudices are notions or opinions which the mind entertains without knowing the grounds and reasons of them, and which are assented to without examination. Do what you can there will still be bias from education; and, if so, is it not better this bias should lie towards things laudable and useful to society? (*MIM* 175 & 176)

Returning to *Alciphron* Dialogue 1, the discussion moves to the analogy of a wise man. Euphranor demands to know whether Alciphron will consent to the view that

⁹⁸ This section is referenced by Berkeley again in *MIM*, where he makes a similar point about truth and goodness. (*MIM*, 181-182)

the wise man is the one who acts with design and ends in mind, rather than 'aiming at random':

Euphranor: By how much, therefore, the end proposed is more excellent, and by how much fitter the means employed are to obtain it, so much the wise is the agent to be esteemed. (...) Can a rational agent propose a more excellent end than happiness? (...) Is not the general happiness of mankind a greater good, than the private happiness of one man, or of some certain men? (*Alciphron*, D1 §16)

Alciphron concedes these points. Later, he resists the final claim about the superiority of the pursuit of general happiness over individual happiness, suggesting, as an egoistic hedonist might, that relative to an individual being, personal happiness is all that should matter: 'the individual happiness of every man alone constitutes his own entire good.' (*Alciphron*, D1 §16)

Going forward, they will pursue the connection between rationality and religion, and whether one can determine a necessary connection between religion and happiness. However, it is certainly an early victory for Euphranor to have convinced Alciphron that truth and public usefulness are related in the way that he has. Many of Euphranor's remarks are similar to those found in early James and Peirce:

Our conception of (...) effects, then, is for us the whole conception of the object, so far as that conception has positive significance at all. This is the principle of Peirce, the principle of pragmatism (...). The ultimate test for us of what a truth means is indeed the conduct it dictates or inspires (...). [T]he effective meaning of any philosophic proposition can always be brought down to some particular consequence, in our future practical experience, whether active or passive (...). (James, *The Pragmatic Method*, 124)

Popkin described Berkeley's powerful dual influence on American thought as follows:

No figure in the history of European philosophy has had a more direct and enduring influence on American thought than George Berkeley; first through his voyage to America, when he personally bestowed on the young colonies the benefit of his wise assistance, and later through his philosophical achievements. (Popkin, 1953, p. 128)

Berkeley's role in inspiring American pragmatism is the key theme of Popkin's piece. (Popkin, 1953, pp. 129-140) James' writings are deeply influenced by Berkeley, as

is obvious from his discussions of (e.g.) the role of common sense in philosophy and the 'pragmatic' spirit of Berkeley's treatment of matter.⁹⁹

The substance of the second dialogue is, broadly, the matter of whether there is any inherent connection between rationality, religious belief and morality. Lysicles tells Euphranor that his goal is to show that 'there is nothing in that necessary connection which some men imagine between those principles you contend for, and the public good' (*Alciphron*, D2 §1). It is agreed by most parties (including Mandeville) that Lysicles is supposed to represent Mandeville and his views.¹⁰⁰ However, it is also agreed by most of the same sources that his portrayal of Mandeville's views is unfair, and pays insufficient attention to aspects of the theory that would allow a Mandevillian to respond to Euphranor's remarks.¹⁰¹ Lysicles both consents to propositions that Mandeville would certainly refuse and ignores many important subtleties and qualifications in the *Fable of the Bees* version of events.¹⁰²

⁹⁹ See especially the lecture 'Pragmatism and Common Sense.' James also regarded Berkeley's criticism of matter as deeply pragmatic: 'Berkeley's treatment of the notion of matter is so well known as to need hardly more than a mention. So far from denying the external world which we know, Berkeley corroborated it. It was the scholastic notion of a material substance unapproachable by us, *behind* the external world, deeper and more real than it, and needed to support it, which Berkeley maintained to be the most effective of all reducers of the external world to unreality. Abolish that substance, he said, believe that God, whom you can understand and approach, sends you the sensible world directly, and you confirm the latter and back it up by his divine authority. Berkeley's criticism of 'matter' was consequently absolutely pragmatic.' (William James: Writings 1902-1910, p. 525)

¹⁰⁰ Berman (1993), Brykman, Jaffro et al. (2010), DeBolt (2015), Harth (1989, p. Introduction). See De Bolt for a summary of the evidence for this claim.

¹⁰¹ Berman suggests that Lysicles fails to capture the tension between Mandeville and Shaftesbury and acknowledges that Berkeley looks to represent the views as they appear in public discourse and in the mind of the freethinker, rather than in publications. So, though Berman might contest the claim that Berkeley is unfair to Mandeville, he would, I think, allow that Berkeley was wilfully straying from the textual version of things.

¹⁰² Stoneham, on the representation of Mandeville, and the general case: 'It is worth reminding ourselves that Lysicles presents lots of different views throughout the book, claiming none as his own but using them to show the arguments of his 'sect'. It would be a crass misreading of the text to think that because Lysicles presents X's views, we can even partially identify the character of Lysicles with the historical character X.' (Stoneham T. , pp. (ms) p11, Note 8)

Mandeville outlines a number of the ways he has been misread in general in the preface to the revised 1724 edition of the *Fable of the Bees* and by Berkeley specifically in his *Letter to Dion* of 1732:

It is impossible that a Man of the least Probity, whilst he is writing in Behalf of Virtue and the Christian Religion, should commit such an immoral Act as to calumniate his Neighbour, and wilfully misrepresent him in the most atrocious Manner. If Dion (the narrator) had read The Fable of the Bees, he would not have suffer'd such lawless Libertines as Alciphron and Lysicles to have shelter'd themselves under my Wings; but he would have demonstrated to them, that my Principles differ'd from theirs, as Sunshine does from Darkness.' (A Letter to Dion, p. 11)

However, as is noted in Viner's introduction, and relates back to my discussion of the mathematical issues of two characters representing six, 'Berkeley had more sinners in mind than Mandeville, and Mandeville more critics than Berkeley.' (Viner, 1953) Thus, it's plausible that Berkeley incorporates aspects of other well-known freethinking ideology (perhaps, especially that of Hutcheson) into his portrayal of Mandeville in Lysicles.

The discussion in the second dialogue begins with Lysicles making the case for drunkenness, on the grounds that this vice can produce public virtue in the form of economic stimulus. By driving public effects—such as increased revenue from malt tax, increased employment in manufacturing and trading, and further stimulating ancillary markets (barrel manufacture, boat maintenance for imported luxuries etc.)—an individual's drunkenness, it is said, can generate benefits for a multitude of people and industries. Lysicles goes on to offer similar arguments for gambling and the 'keeping' of a mistress (especially one born to a disadvantaged background). The additional work the economy must do to satisfy this above-average demand for alcohol (and in the mistress case, the demand for the labours of 'milliners, laundresses, tire-women, mercers' etc.), the relative rewarding of the ingenious (in gambling) and the new industry that may be engendered are seen as the kind of public goods that a society should pursue. Thus, according to Lysicles, the public good (on the one hand) and religious adherence to morality (on the other) are not connected in the way required for Euphranor's argument from the previous dialogue.

I will leave aside a discussion of the way that Lysicles oversimplifies the relevant arguments in order to concentrate on what Berkeley wants us to take from the criticism he does provide. There are two important elements to his response to this approach. The first is addressed very briefly, but is an interesting example of his commitment to the idea that certain examples of language are philosophically dangerous (as has been discussed in the first chapter). When Euphranor's response to Lysicles' ideas is a kind of moral shock, Euphranor wonders out loud if these 'vicious' notions can be accepted or appreciated by many in society. Lysicles' response is to explain that freethinkers use euphemisms for the various vices to avoid causing consternation in the reader:

Thus in our dialect a vicious man is a man of pleasure, a sharper is one that plays the whole game: a lady is said to have an affair: a gentleman to be gallant: a rogue in business to be one that knows the world. By this means we have no such things as sots, debauchees, whores, rogues, or the like in the *beau monde*, who may enjoy their vices without incurring disagreeable appellations. (*Alciphron*, D2 §3)

Thus, it's clear that Berkeley is still worried about the capacity of language to mislead in a damaging way. The more important response to this argument for vice (for my current purpose) is Berkeley's immediate movement to the discussion of the probable failure of this speculative model in practical application.

In the case of drunkenness, Berkeley argues that the most economically stimulative relationship a person can have with alcohol is the kind of one that is most consistent with a long, reasonably healthy life of drinking! Certainly, spending above average amounts on alcohol to afford a privately 'vicious' relationship with it may benefit the tax office, vintners and coopers in the short term. However, in the case of vices that are also unhealthy for the individual, those public returns diminish in a way that is likely to be ultimately worse for the economy overall. Additionally, there may be unforeseen public costs, such as those arising if the drunkenness leads to public property damage, strain on doctors' businesses, unpaid debt etc. So, though the speculative model put forward by Lysicles may have initial theoretical appeal, the inattention to the details of its application—and the features of the actual world it is supposed to map—means it won't produce the projected results in practice.

Euphranor: Hence you think a drunkard most beneficial to the brewer and the vintner, as causing a quick consumption of liquor, inasmuch as he drinks more than other men.

Lysicles: Without doubt.

Euphranor: Say, Lysicles, who drinks most, a sick man or a healthy?

Lysicles: A healthy.

Euphranor: And which is the healthiest, a sober man or a drunkard?

Lysicles: A sober man.

Euphranor: A sober man therefore in health may drink more than a drunkard when he is sick.

Lysicles: He may.

Euphranor: What think you, will a man consume more meat and drink in a long life or a short one?

Lysicles: In a long.

Euphranor: A sober¹⁰³ healthy man, therefore, in a long life may circulate more money by eating and drinking, than a glutton or a drunkard in a short one. (...) [I]t should seem, that he may be more beneficial to the public, even in this way of eating or drinking. (*Alciphron*, D2 §5)

Unfair though this section certainly is, since it's hard to imagine anyone unravelling in their position as willingly as Lysicles does here, it is important to note the dialectic between Euphranor and Lysicles at this point. Lysicles responds to Euphranor's shock at the outline of his argument for vice by explaining that those who are less cultured than the members of his freethinking circles find the logic and causal nature of their argument confusing. That's why they cannot see its merit—they are insufficiently adept at speculative thought, claims Lysicles:

Your moralists and divines have for so many ages been corrupting the genuine sense of mankind, and filling their heads with such absurd principles, that it is in the power of few men to contemplate real life with an unprejudiced eye. And fewer still have sufficient parts and sagacity to pursue a long train of consequences, relations, and dependences which must be done in order to form a just and entire notion of the public weal. (*Alciphron*, D2 §2)

¹⁰³ It is worth noting that the bar for 'sober' was much lower in this generation. In Dr Johnson's dictionary: 'SOBER, (so'-ber) *a.* Temperate, particularly in liquors; not drunken; not overpowered by drink; not mad;' and 'TEMPERATE, (tem'-per-ate) *a.* Not excessive; moderate in degree of any quantity.' (Johnson, 1768) Thus, to be sober can mean merely not being a drunkard.

Euphranor's response, as indicated above, is to say that it is not a failure of understanding in logic and dependency relations that prevents the traditionalist from seeing the benefit of this freethinking approach. Rather, the problem is that the freethinker, considering only the speculative theory and not how it will interact with the specifics of an economy over time, fails to see the limitations of his own theory.

Moving now to the fourth dialogue, Alciphron begins by suggesting that he and Euphranor lay out their basic assumptions and 'lay down certain rules and limitations, in order to shorten [their] present conference' (*Alciphron*, D4 §2). In discussing his expectations of Euphranor's case for God, Alciphron states that he would consider equally likely (and equally unconvincing): 1) metaphysical arguments (such as those concerning the unreasonableness of infinite causal chains or the conceptual necessity of a perfect being); 2) arguments from authority (both of wise individuals and of the collective authority garnered by the endorsement of populations of the past and present); and 3) 'arguments from utility and convenience' (*Alciphron*, D4 §2).

1) and 2) above fit into the typical categories of natural and revealed theology. The first represents two classic arguments of the history of apologetics: variants of the cosmological and ontological arguments. The second case is more complicated. Arguments from authority, on the basis of supposed sacred persons, are beyond the scope of natural religion and should be regarded as revealed theology. Arguments from authority that are grounded in something like the common consent of mankind, though *a posteriori*, are nevertheless available to all through reasoning and should be regarded as natural theology.¹⁰⁴ Then in 3), Alciphron argues, he won't be persuaded by pragmatic benefit arguments because though they may demonstrate usefulness, they cannot demonstrate existence. This third option is less typical in the philosophical consideration of reasons for religious belief, but is the position Euphranor will emphasise most strongly. It is the strain of argument that is discussed in the greatest detail, and importantly, fits with the pragmatist account of meaning he advances in the seventh dialogue. By positing it

¹⁰⁴ For discussion of this kind of 'common consent' argument in the early modern period, see Reid (2015).

as an equal of the natural and revealed theological cases, he is drawing attention to the view that it should be considered similarly important in discussions of God.

By the end of the fourth dialogue, Berkeley's Euphranor has, via the divine visual language argument, persuaded Alciphron of the existence of some intelligence that may as well go by the name God. Alciphron: 'we will grant, that there is a God in this dispassionate sense: but what then?' (*Alciphron*, D4 §25) So, Alciphron ends this dialogue by asking what good this kind of metaphysical God is, and perhaps appealing to the more utilitarian question of what such a result really amounts to, morally and spiritually speaking. The focus of the fifth dialogue is the utility of religion to its believers and to society more broadly, and as I hope is clear, the attention of the reader has been drawn to the more pragmatic elements of religious belief and their benefit. The sixth dialogue focuses on Scripture: its form, contents and external evidences (Jakapi R. , 2010, pp. 354-355). Jakapi contrasts this Christian Scriptural defence with the philosophy of *Alciphron*:

On the whole, the dialogue serves as a valuable guide to the Christian context and framework of Berkeley's thought. In many cases, the grasping of this context helps us to better understand his philosophical thought. (Jakapi R. , 2010, p. 356)

Thus, Dialogue 6 defends the right to believe in the testimonial authority of Scripture. Now, I move to Dialogue 7, where Berkeley provides, through Euphranor, the *philosophical* defence of religious content attacked by freethinkers as meaningless.

2.5

Dialogue Seven

Development

In this section I will articulate my reading of Berkeley's mature theory of meaning, as we see it advanced by Euphranor in the argumentative climax of *Alciphron's* final

dialogue. The scholarship on this element of Berkeley's philosophy is relatively young, compared with the literature on idealism and immaterialism. However, philosophy of language and meaning is now a more central component of Berkeley's scholarship.¹⁰⁵ Flew's paper 'Was Berkeley a Precursor to Wittgenstein?' (2013, first published 1974) provides an interesting way in. His answer to the titular question was yes, and so is mine.¹⁰⁶

Flew begins with Hume's two acknowledgements of Berkeleyan influence in his thinking. One occurs in the *Enquiries* and one in the *Treatise*—both concern Berkeley's arguments against abstract general ideas. Flew calls these acknowledgements insufficient, and more, he notes, they ignore the most distinctive feature of his views (by failing to discuss *Alciphron*):

[I]n Dialogue VII, (...) Euphranor argues that 'the algebraic mark, which denotes the root of a negative square, hath its use in logistic operations, although it be impossible to form an idea of any such quantity. And what is true of algebraic signs is also true of words and language; modern algebra being in fact a more short, apposite, and artificial sort of language (...)'.¹⁰⁷

This (...) constitutes a 'revolutionary and historically premature insight'. What Hume welcomed so enthusiastically in the *Treatise* was an elaboration of the received doctrine that the understanding of a word requires the occurrence of (...) corresponding mental imagery. But what Berkeley maintains here in the *Alciphron* flatly contradicts that received doctrine. The crux now is neither the actual nor the potential occurrence of mental imagery. What matters is not the (private) idea but the (public) use—'its use in logistic operations'. And, furthermore, 'what is true of algebraic signs is also true of words and language'. (Flew, 2013, p. 216)

Even in the *Principles Introduction*, Berkeley made space for a version of word meaning allowing that the primary component of word meaning may not be idea-representation, and that a word may have significance though it represents no idea at all. This theory is treated in more detail in what is now called the *Manuscript*

¹⁰⁵ Important contributions to this scholarship include: Belfrage (1986), (1986, p. b), (1985), Berman (1981), (1994), Brykman (1993), (2010), Flew (2013), Pearce (2014), (2017), Jakapi (2002), Jakapi and Williford (2009) and Williford (2003).

¹⁰⁶ Flew focuses on Wittgenstein's neo-pragmatist philosophy of language, and the 'meaning is use' interpretation, but as I argue Berkeley's work can be evaluated equally in comparison with the earlier American pragmatists (Peirce, James and Dewey).

Introduction, where Berkeley applies it to religious language specifically. Paraphrasing Reid: Christians were not taught about ‘the good things which God had prepared for them’ in order to make them frame clear ideas of those particular good things, but merely so as ‘to make them more cheerful and fervent in their duty’. (Reid J. , 2002, p. 3).¹⁰⁷

My focus here is on the theory of meaning in *Alciphron* Dialogue 7, as distinct from that in the preceding philosophy. I concentrate on the *Alciphron* account because I think it represents a departure from the version given in the *Principles*. And, nested in its new more pragmatically focused context, I think we should understand it differently. Indeed, it is important to the salience of my account that the version given in *Alciphron* Dialogue 7 represents a significantly changed position to that in the *Principles* and earlier work. Since Berkeley had some kind of proto-pragmatist elements in the linguistic discussions of the *Principles Introduction* and perhaps even more so in the *Manuscript Introduction*, it seems that only an account of an important change can justify what I claim is a different and new outlook on mathematical and scientific matters in *Alciphron*.

The *Manuscript Introduction* features perhaps surprisingly infrequently in my discussion, especially given that it is regarded as an important text in understanding the ideational theory and Berkeley’s interaction with it. The primary reason for this is that I am trying to document a change in public position. Though the case is put more forcefully and at greater length in the *Manuscript Introduction (MI)* (when compared with the *Principles Introduction*) the fact remains that the *MI* is not the version of things that Berkeley chose to accompany the empiricist arguments of the *Principles*. He did not change the *Principles Introduction* in his republication of the *Principles*, and we should assume he still thought that the *PI* was the semantic introduction best suited to that early philosophy.

Others have chosen to focus on that work¹⁰⁸, and happily, some of this scholarship can be used to support my reading. Williford (2003) highlights one key

¹⁰⁷ The quoted sections are cited from Volume 2 of the collected works edited by Luce and Jessop (1953, p137), and in the Belfrage edition (Belfrage B. , 1987, p. 107).

¹⁰⁸ See especially Williford (2003) and Belfrage (1987).

piece of argument Berkeley pursues in the *MI*. Williford quotes the following passage of *MI*:

But to give a farther account, how Words came to introduce the Doctrine of Universal Ideas, it will be necessary to observe there is a notion current among those that pass for the deepest Thinkers, that [1] every significant Name stands for an Idea. It is said by them that [2] a Proposition cannot otherwise be understood than by perceiving... the Ideas marked by the terms . . . of it. Whence it follows that according to those Men [3] every Proposition that is not Jargon must consist of Terms or Names that carry along with them each a determinate Idea. This being so, and it being . . . withall [*sic*] certain that [4] Names which yet are not thought altogether insignificant do not always mark out particular Ideas it is straightway concluded that [5] they stand for general ones. (Williford K. , 2003, pp. 274, quoting §33 *MI*).

Williford understands Berkeley's avowed *MI* project in the following terms: 'The goal of Berkeley's theory is to explain how it is that proposition 4 is true, given the falsity of the other claims.' (Williford K. , 2003, p. 275) So, he is attempting to provide an account explaining how words can be meaningful when they do not stand for either particular or general ideas. Williford also acknowledges an important aspect distinguishing the *MI* account from the *Alciphron* account:

It should be noted immediately that Berkeley is not giving us a theory of terms that *never* have ideas answering to them. That is, very much unlike the usual theories of emotive meaning, Berkeley is *not* offering a theory in the *MI* that would fix the emotive meaning of evaluative terms like 'good' and 'beautiful' or, as in *Alciphron* VII, theological or theoretical terms like 'grace' and 'force' – words that arguably *never* have ideas answering to them. Every term Berkeley mentions in his examples is such that it *can* stand for an idea. His point is that in some contexts the terms do not but are nonetheless meaningful. (Williford K. , 2003, p. 278)

The position in *MI* is significantly different with respect to its remit from that in *Alciphron*¹⁰⁹, as Williford notes. This is not my focus, but it is a helpful caveat to bear in mind as I move to contrast the *PI* and *Alciphron* positions. Berkeley rejects the universal claim that all words must represent a clear idea if they are to be meaningful in §20 of the *PI*:

¹⁰⁹ The crucial passages I have in mind here are §16-18 in *Alciphron*, Dialogue 7. They are quoted in detail later in this section.

Besides, the communicating of Ideas marked by Words is not the chief and only end of Language, as is commonly supposed. There are other Ends, as the raising of some Passion, the exciting to, or deterring from an Action, the putting the Mind in some particular Disposition; to which the former is in many Cases barely subservient, and sometimes intirely omitted, when these can be obtained without it, as I think doth not unfrequently happen in the familiar use of Language. (*Principles Introduction*, §20)

Thus there are other ends to which the use of language is put (than the transmitting of ideas) and this kind of use is not infrequent in familiar language. What remains unclear here is the nature of the conditions that would make it such that idea-representation can be omitted (and meaning retained); the cases in which idea-representation is merely 'subservient'.

The semantic alternatives are clear—altering the disposition of another's mind, stimulating action, influencing others etc. In *Alciphron*, we see that what was initially (in the *PI*) a qualification or corrective to the Lockean view of meaning is now at the centre of Berkeley's account of language. In the *PI*, language emerges out of learning that seems to correspond to a Lockean framework, but sophisticated language users may bypass idea-representation in certain circumstances. This is a 'there exist some x that are not y' claim. For this and other reasons, Pearce sees Berkeley as still committed to a Lockean kind of theory (especially when it comes to religious epistemology), or one very much still attendant to it in *Alciphron*:

Berkeley and Browne use the same basic strategy to respond to the Locke-Toland argument: both claim that statements may be meaningful by being connected to our simple ideas by a more complicated and tenuous route than Locke's theory allows, and that religious statements are so connected. (Pearce K. , 2014, p. 431)

I think Pearce here presents the *Alciphron* material as though it is the *PI* material. Of course, in a specific discussion of the extent to which Berkeley is committed to Lockean epistemology, it's unsurprising that the treatment is brief, but the important difference is that the connection to our simple ideas which Pearce describes as 'complicated and tenuous' is something of an understatement since in *Alciphron*, the connection to ideas (in the case of certain terms) can be obliterated, which seems not to be the case in the *Principles*. This important distinction comes across more clearly in Pearce's work specifically on *Alciphron*, Dialogue 7:

The aim of *Alciphron* 7 is to answer objections to the meaningfulness of certain religious utterances by developing and defending a general account of meaningfulness and showing that the meaningfulness of these utterances follows from the account. According to this theory, words are meaningful when they are associated with conventional rules whereby they are used in human society to achieve practical ends. Some of these rules are ideational: they permit us to ‘exchange’ the words for ideas. Many other rules, however, are operative: they direct us to take certain actions or feel certain emotions without the meditation of ideas. These rules connect words together in a complex web in order to help us navigate the world and ultimately achieve “that happiness, which is the ultimate end and design, the primary spring and motive, that sets rational agents at work” (Alc, §7.17) (Pearce K. L., 2017, p. 66)

It is clear from this section that the theory of meaningfulness is a general one in which words may have meaning though they are connected to no idea, or, strictly in virtue of their usefulness in securing practical ends. I return to the specifics of the wording in *Alciphron*, Dialogue 7 shortly, but first move to the motivation of Berkeley’s later linguistic thinking in the work of John Toland.

Below, I analyse what I take to be a key source of motivation for this initial exception (and later privileging) of meaning devoid of idea-representation—Toland’s appropriation of Locke’s theory of meaning for the purposes of delegitimising certain religious concepts. I note the parallels between this view and some of the better known modern variants. Finally, I argue that this view explicitly covers infinitesimals and similar concepts in a way that means that the pragmatism avowed in Dialogue 7 must ultimately vindicate them, and calculus, on pragmatic grounds.

As I argued in Chapter 1, Berkeley evolved from a philosopher considering the idea theory of meaning as an obvious axiom of his own philosophical system into one willing to defend word meaning entirely absent of ideas. There may be many reasons for this change of position—particularly the simple thought that this just didn’t seem to be how meaning worked, in Berkeley’s view—but, an interesting case that may have shown him the dangers of treating the idea theory as axiomatic

(or even generally true) must have been Toland's use of it in his arguing against certain doctrinal elements in *Christianity not Mysterious*.¹¹⁰

Toland uses the combination of Locke's theories of language and knowledge to show that certain expressions (particularly those stating mysteries of the faith) cannot constitute knowledge or be a worthy subject of belief, if Locke's general account is right. If language is about words representing ideas, and knowledge is about perception of the agreement or disagreement of our ideas, then, where there are no ideas, there can be no knowledge. Toland's goal in *Christianity not Mysterious* is to demonstrate that there is nothing in the Christian gospel that requires the believer to endorse mysteries, or truths contrary to or above reason. Describing the relevant portion of his work, he says:

In the [second] Discourse, equally concerning Christians and others, I attempt a particular and rational Explanation of the reputed Mysteries of the Gospel. (Toland, *Christianity Not Mysterious*, 1696, Preface)

Locke had avoided making a similarly controversial claim by acknowledging that though no truth is contrary to reason, some revealed truths may be *above* reason.¹¹¹ This way he forges a division between reason-eligible truths of revelation (which might equally be learned by reason if not revealed) and reason-ineligible truths of revelation. The latter are not contrary to reason but of a different epistemic kind:

But, *Thirdly*, There being many things wherein we have very imperfect notions, or none at all; and other things, of whose past, present, or future existence, by the natural use of our faculties, we can have no knowledge at all; these, as being beyond the discovery of our natural

¹¹⁰ Brykman (2010), Pearce (2017) and Duddy (1999) also specifically motivate their *Alciphron* accounts in terms of responses to *Christianity not Mysterious*.

¹¹¹ See Locke's *Essay* (IV xviii §4-11). Especially §5: 'Even original revelation cannot be admitted against clear evidence of reason. [T]herefore, no proposition can be received for divine revelation, or obtain the assent due to all such, if it be contradictory to our clear intuitive knowledge. Because this would be to subvert the principles and foundations of all knowledge, evidence, and assent whatsoever: and there would be no difference between truth and falsehood (...)' (*Essay*, IV xviii §5). 'In all things, therefore, where we have clear evidence from our ideas, and those principles of knowledge I have above mentioned, reason is the proper judge; and revelation, though it may, in consenting with it, confirm its dictates, yet cannot in such cases invalidate its decrees: nor can we be obliged, where we have the clear and evident sentience of reason, to quit it for the contrary opinion, under a pretence that it is matter of faith: which can have no authority against the plain and clear dictates of reason' (*Essay*, IV xviii §6).

faculties, and *above reason*, are, when revealed *the proper matter of faith*. (*Essay*, IV xviii §7)

Nonetheless, they should not stand contrary to reason:

Whatever God hath revealed is certainly true: no doubt can be made of it. This is the proper object of faith: but whether it be a *divine* revelation or no, reason must judge; which can never permit the mind reject a greater evidence to embrace what is less evident, nor allow it to entertain probability in opposition to knowledge and certainty. (...) *Nothing that is contrary to, and inconsistent with, the clear and self-evident dictates of reason, has a right to be urged and assented to as a matter of faith, wherein reason hath nothing to do.* (*Essay*, II xvii §10)

Understandably, this approach has been regarded as very rationalistic. Paul Helm describes it as anti-enthusiastic (appealing to the relation of this work to the section 'On Enthusiasm' Locke added to the *Essay's* fourth edition in response to the Locke-Stillingfleet Correspondence).¹¹² The enthusiasts, per Pearce (2014) are those 'such as Quakers and some radical Puritans who claim theological certainty on the basis of private religious experience' (Pearce K. , 2014, p. 419). Helm describes Locke's approach as motivated by a desire to protect natural theology by 'overthrow[ing] claims to religious knowledge and authority based on personal inspiration and immediate revelation' (Helm, 1973, p. 53). It's clear that this position suggests a high bar for revealed knowledge, one that certain elements of traditional faith (like miracles and mysteries) may struggle to clear. The notion of a belief being 'above reason' is going to have to rescue a number of valuable tenets (the Holy Trinity, grace etc.).

One view of Locke's approach on this matter is that it opens the door to a rationalist criticism of religious items embraced by the orthodoxy:

While Locke professes to emphasise the complementary roles of reason and revelation, it is easy to read him as tipping the balance very much in favour of reason and effectively preparing the way for arguments that could be used to make a case for a form of religious belief, such as deism, that purports to be altogether rational in origin and character. Locke in *The Reasonableness of Christianity* (1695) expressly rejected deism, claiming it to be a subversion of Christianity, but in Book IV of the *Essay* he has provided thinkers more radical than himself with the makings of the deistic argument. (Duddy, 1999, p. 50)

¹¹² Locke (1824, pp. 1-191).

By weighting reason and rationality so heavily in the evaluation of religious beliefs, Locke made space for a criticism of much more than just the over-enthusiastic accounts of revealed knowledge. This emphasis on the autonomy of reason was picked up by Anthony Collins,¹¹³ but it is especially clear in Toland's commandeering of it in *Christianity not Mysterious*. As in Locke, nothing required of a Christian believer can be *contrary* to reason, but Toland extends this by further challenging the idea that God would want us to accept doctrines *beyond* or *above* our understanding. This analysis is to include the rejection of terms to which no ideational meaning can be attached:

Whoever reveals any thing, that is, whoever tells us something we did not know before, his Words must be intelligible, and the Matter possible. This RULE holds good, let God or Man be the Revealer. If we count that Person a Fool who requires our Assent to what is manifestly incredible, how dare we blasphemously attribute to the most perfect Being, what is an acknowledg'd Defect in one of our selves? As for unintelligible Relations, we can no more believe them from the Revelation of God, than from that of Man; for the conceiv'd Ideas of things are the only Subjects of Believing, Denying, Approving, and every other Act of the Understanding: Therefore all Matters reveal'd by God or Man, must be equally intelligible and possible; so far both Revelations agree. (*Christianity not Mysterious*, II i §16)

This quote notes a further element of contemporary debate among contemporary Irish and British thinkers: the appropriateness of arguing about God's properties and nature via analogies about humans and other non-divine beings.¹¹⁴

Toland regards the celebration of mysteries of Anglicanism and finds them as deserving of reform (and scorn) as transubstantiation 'and other fables of the

¹¹³ Both *An Essay Concerning the Use of Reason* (1707) and *A Discourse of Free-thinking* (1713) invoke Locke's theory of knowledge and distinction between probable and demonstrable truths. Locke is mentioned in the main text and postscript of the latter work as being alleged to be an atheist and a freethinker by some the same people (e.g. 'Reverend Mr [William] Carroll', author of a *Dissertation upon the Tenth Chapter on the Fourth Book of Mr Locke's Essay concerning Human Understanding* (1706) (*A Discourse of Free-Thinking*, 84)) who criticise his own work as emblematic of those sects.

¹¹⁴ Berkeley, Toland, Peter Browne and William King were all involved in this controversy. Berkeley criticised Browne's view in the fourth dialogue of *Alciphron* and Browne responded a year later in a way that Berman suggests caused Berkeley to modify his language in the 1752 edition. Peter Browne also wrote against Toland's *Christianity not Mysterious*. For analysis, see Pittion and Berman (1969) and Curtin (2014).

church of *Rome*' abandoned in the Reformation (*Christianity not Mysterious*, II i §2). In cases where we are asked to endorse views whose notions require 'understanding' contradictions, on the grounds that they are delivered by God, Toland believes this must lead to great uncertainty and scepticism. 'The very Supposition, that Reason might authorize one thing, and the Spirit of God another, throws us into inevitable *Scepticism*; for we shall be at a perpetual Uncertainty which to obey: Nay, we can never be sure which is which' (*Christianity not Mysterious*, II i §2). Duddy describes Toland's 'irrational hypothesis', and its connection to Locke:

Toland's critique of what he calls 'the irrational hypothesis', which is the claim that we are required to accept doctrines, even when they are contrary to reason or beyond our understanding – turns on the Lockean assumption that there is a reciprocal relationship between words and ideas (...) (Duddy, 1999, p. 51)

Toland and Berkeley approach this 'irrationality' situation very differently. Responding to the puzzling position Locke's theory leaves us in (with respect to the mysterious parts of religion), and faced with the option of disavowing this pretty typical way of thinking about the constraints rationality places on our beliefs, Toland opts to retain this understanding of rationality and knowledge, and find a way to make religion conform to it. Thus, he sets out to show how Christianity need not fail these rationality tests if suitably amended (by either removing or naturalising problematic content). And, Toland takes the opportunity of the precedent provided by the example of the Reformation to present this as a legitimate response. Berkeley's response is to move in exactly the other direction. He sees the failure of religion to meet typical standards of rationality to be caused by the excessively rigid account of meaning underlying it—one that encourages the believer to reject concepts where there is inconsistency or unintelligibility in the ideas represented. For him, we should not expect to 'understand' (in Locke's sense) all facts about the divine, we may merely assent, in the sense of agreeing with it or taking it to be true.¹¹⁵

¹¹⁵ For discussion of Berkeleyan 'assent' see Pearce (Pearce K. L., 2017, pp. 139-157).

In Berkeley's view, all one need to do to improve religion's performance under this kind of analysis is to modify the account of meaning so that meaningfulness needn't be defined solely in terms of idea agreement.

Toland's sense of God's omnipotence was that it was dependent on what was really possible. When we describe God as omnipotent, we attribute to him the ability to do all that is possible. For Toland there is a sense in which that possibility is prior and fixed. 'When we say then, *that nothing is impossible with God*, (...) we mean whatever is possible in itself, however far above the Power of Creatures to effect' (*Christianity not Mysterious*, II i §8). Thus, God cannot have us believe or understand contradictions; and, knowing or understanding him can't require such cognitive acts. To show the dependence of this problem on the background account of meaning we may look to Toland's discussion of an example case—one he regards as asking the believer to entertain content that is inconsistent or impossible: limbo.

So to say, as the *Papists*, that *children dying before baptism are damned without pain*, signifies nothing at all: For if they be intelligent creatures in the other world, to be eternally excluded God's Presence, (...) must prove ineffable torment to them: But if they think they have no understanding, then they are not capable of Damnation in their sense; and so they should not say they are in *Limbo-Dungeon*, but that either they had no souls, or were annihilated; which (...) would be reasonable enough, and easily conceived. Now if we have no Ideas of a thing, it is certainly but lost labor for us to trouble our selves about it: For what I don't conceive, can no more give me right notions of God, or influence my Actions, than a Prayer delivered in an unknown tongue can excite my devotion: (*Christianity not Mysterious*, II i §4)

To say, for example, that *a thing is extended and not extended, is round and square at once*, is to say *nothing*; for these ideas destroy one another, and cannot subsist together in the same subject. But when we clearly perceive a perfect agreement and connection between the terms of any proposition, we then conclude it possible because intelligible (*Christianity not Mysterious*, II i §13)

Toland uses an example from Catholicism (limbo), and appeals to transubstantiation. However, there is no good philosophical reason why what he says can't be applied equally to Anglicanism, and presumably the negative association with what might have been regarded as the theoretical excesses of Catholicism would have been strongly appreciated by an Anglican reader. As the

seventh dialogue of *Alciphron* unfolds, this style of argument is put in the mouth of Alciphron.

Meaning in Dialogue 7

The beginning of Dialogue 7 sees Alciphron acknowledge the progress made by the theists in the previous dialogues. Alciphron admits that he has heard good arguments about the benefits of belief and the usefulness of religion and ‘he could not deny several probable reasons were produced for embracing the Christian faith.’ (*Alciphron*, D7 §1) This progress is checked somewhat by Alciphron’s statement of an epistemic principle that should be familiar from the above discussion of Locke and Toland:

Those reasons being only probable can never prevail against absolute certainty and demonstration.¹¹⁶ If I can therefore demonstrate your religion to be a thing altogether absurd and inconsistent, your probable arguments in its defence do from that moment lose their force, and with it all right to be answered and or considered. (*Alciphron*, D7 §1)

If there are decent arguments both for and against belief in God, then the character and quality of the arguments will be decisive. A demonstrative argument, for example from the inconsistency of a concept or impossibility of an idea, to the conclusion that God does not exist or is impossible, must be treated as conclusive, according to Alciphron. Regardless of the quality of the pragmatic and linguistic arguments of the earlier dialogues, if Alciphron can show, logically, that a certain concept entails contradictory content, then that will overthrow the apparent strength of the theist position—‘No testimony can make nonsense sense.’ (*Alciphron*, D7 §1)

¹¹⁶ One can see how this view is also taken up by Hume in the *Enquiry Concerning Human Understanding*, where a demonstration (which, in Hume’s vernacular means either a proof or a probability so high that it approaches certainty) of God’s non-existence can never be challenged by even the strongest kind of probability that testimony about miracles can garner. (*Enquiry*, pp. X §12-13)

Euphranor simultaneously retains his pragmatic outlook while ostensibly accepting this challenge, explaining that to do so is to ‘reduce’ their ‘enquiry within a narrow compass’. Following this set-up for the dialectic to come, Alciphron begins his arguments immediately in the opening of section 2, and his first statement is the Lockean picture of things utilised by Toland:

Words are signs: they do or should stand for ideas; which so far as they suggest they are significant. But words that suggest no ideas are insignificant. He who annexes a clear idea to every word he makes use of speaks sense: but where such ideas are wanting, the speaker utters nonsense. In order therefore to know whether any man’s speech be senseless or significant, we have nothing to do but lay aside the words and consider the ideas suggested by them. (*Alciphron*, D7 §2)

Intelligibility, reasonableness, sense, significance—all are defined for Alciphron by their demand that concepts conform to the idea theory of meaning. And, the great mistakes of the philosophers arise when reasoning is done with names or words that fail this test or are empty of coherent reference. Reasoning only at the level of the signs (names, words) means that philosophers press on with inferences and theories though they contain items that stand for nothing.¹¹⁷

Section 3 begins with a restatement of Locke’s epistemology. To have the opening lines of the two first argumentative paragraphs (here I’m discounting §1 as scene-setting) state the two pillars of the Lockean epistemology should surely be seen as a sign that Berkeley is intentionally flagging the potential dangers that Locke’s system presents.¹¹⁸ The core principles of the ‘new philosophy’ on meaning

¹¹⁷ This is in stark contrast to the position that Euphranor eventually encourages him to accept.

¹¹⁸ An interesting early example of Berkeley discussing linguistic phrases where idea representation isn’t doing the communicative work comes in the *Principles Introduction* when he reflects on the intended meaning of the phrase ‘Aristotle hath said it’ when uttered by a ‘Schoolman’. Berkeley thinks the idea substitution account would give a misleading picture of how this phrase should be understood. Substituting the particles for ideas (notwithstanding the difficulties posed by ‘hath’ and ‘it’), we might get a complex idea of a famous figure in the past having said something (the ‘locutionary content’, as Austin would say)—a factive historical statement. Berkeley presumes that what someone intends when they use this phrase is to dispose you to embrace the opinion (represented by ‘it’), or, at least consider it with the respect appropriate to the authority who endorsed it. In this way, context (here—Aristotle’s status, the special position of Aristotle in the scholastic canon, perhaps even the relative superiority of the utterer) makes a simple idea translation reading of the meaning inappropriate. This is

and knowledge will be the key premises in Alciphron's argument against religion and its cogency:

Though it is evident that, as knowledge is the perception of the connection or disagreement of ideas, he who does not distinctly perceive the ideas marked by the terms, so as to form a mental proposition answering to the verbal, cannot possibly have knowledge: no more can he be said to have opinion or faith which imply a weaker assent, but still it must be to a proposition, the terms of which are understood as clearly, although the agreement or disagreement of the ideas may not be so evident, as in the case of knowledge. (*Alciphron*, D7 §3)

The argument coming is clear: if you accept the idea theory of meaning and you endorse Locke's perception-of-idea-agreement account of knowledge, you must discount as knowledge-eligible or meaningful subjects whose terms and propositions fail to represent clear ideas. But this is no so, according to Berkeley.

According to Berman:

This conclusion only follows if one accepts the Lockean *either, or*—which at one time Berkeley did accept but which in *Alciphron vii*.I he calls 'the primary Motive to Infidelity'—that words *either* communicate ideas and are meaningful, or do not signify ideas and are meaningless. (Berman D. , 1981, p. 225)

According to the freethinker, religion is an irrational subject; therefore, we shouldn't believe its claims or claimants. The world of science is seen as giving licence to this approach, and this demonstrates Berkeley's anxiety that the successes of Enlightenment science might be used as a stick with which to beat disciplines with different methodologies: 'All which will be easily admitted with respect to human learning and science; wherein it is an allowed method to expose any doctrine or tenet by stripping them of the words, and examining what ideas are underneath, or whether any ideas at all?' (*Alciphron*, D1 §3) Euphranor will

extremely common, and an idea not properly analysed until much later philosophy of language (possibly until Austin's speech act theory). The point is, as Berkeley notes, sophisticated language use is so deeply context driven that we have moved past mere symbol pushing, and to attempt to understand people and their intentions as though we haven't, is a mistake. Illocution and perlocution require as much attention as locution.

eventually use Alciphron's insistence on a general standard (for religion and e.g. the sciences) to insist that where the sciences admit a concept on any kind of grounds that are troublesome under the Lockean theory, religion must be allowed concepts with the same kind of *prima facie* problems.

Berkeley's emphasis on parity of reason¹¹⁹ is sustained in *Alciphron*, and part of the main project in the substantial portion of the seventh dialogue is showing that theories which seem, on their face, to only offer an *ad hoc* solution to benefit religious notions, also help to vindicate parts of science that his opponents value. Beyond this 'parity of reason' argument, Berkeley is free to suggest that it needn't be the case that religion meets the same standards as the sciences, since religion obviously depends on supernatural features and emphasises a role for mystery. But, from Berkeley's standpoint, it is a powerful move to show that even faced with inappropriate standards, components of theories of science and reason can be shown to perform similarly. Otherwise, he might well have left things at the defence of the testimonial authority of Scripture. Clearly, Berkeley wants to show that religion can perform well under certain kinds of scrutiny, even if there is a good case to be made that it shouldn't be subjected to it.

The first example of conceptually inadequate religious items raised by Alciphron is grace. Alciphron criticises grace, as a central component of belief, on multiple grounds: the variety and vagueness with which it is described; the multitude of roles it is thought to play; that it is described as a 'vital, active, ruling principle' (*Alciphron*, D7 §4) though there is no agreed definition; that there is no assent over its role in religious life even among experts; and, primarily, that all the aforesaid suggest that the term can represent no clear idea when used by believers.

¹¹⁹ The centrality of 'parity of reasoning' to *Alciphron VII* is made much of by Berman: This line of reasoning—summed up in the proverb 'Sauce for the goose is also sauce for the gander'—constitutes an important part of Berkeley's theological strategy; he employs it in *Alciphron* and also in the *Analyst* (1734) and *Defence of free-thinking in mathematics*. (...) By skilfully using some of the critical results of his early work in philosophy and philosophy of science, Berkeley tries to show that there is nothing 'absurd or repugnant' in Christian mysteries. Thus he contends that while there seem to be difficulties and even contradictions in the Holy Trinity, there are similar difficulties in the received (Lockean) theory of personal identity. And while it is hard to understand grace, it is not any harder than understanding the concept of force; although both 'grace' and 'force' are of considerable use.' (1981, pp. 226-227)

Berkeley then nods to the freethinkers' alleged blind admiration for mathematics and all things speculative by having Alciphron claim that grace's rational inadequacy is 'as clear as anything in Euclid' (*Alciphron*, D7 §4).

We know Berkeley places an enormous amount of importance on grace. If Toland's approach would encourage people to abandon it, then it represents a grave threat to Berkeley. In *SIS*, grace is mentioned as central when Berkeley draws one of his key distinctions between the relative importance of the metaphysical knowledge of God and the practical, saving knowledge of God. The latter is prioritised, and interestingly the metaphysical, 'speculative' kind is in many ways degraded as something that potentially gets in the way of the important, useful kind of knowledge:

From all which it is evident that this saving Knowledge of God is inseparable from the Knowledge and Practice of his Will; the explicit Declaration whereof, and of the Means to perform it, are contained in the Gospel, that divine Instrument of Grace and Mercy to the Sons of Men. The metaphysical Knowledge of God, considered in his absolute Nature of Essence, is one thing, and to know him as he stands related to us as Creator, Redeemer, and Sanctifier, is another. The former kind of Knowledge (whatever it amounts to) hath been, and may be, in Gentiles as well as Christians, but not the latter, which is Life eternal. (*SIS*, 249)

Again, Berkeley draws our attention to the importance of the more pragmatic understanding. In Dialogue 7, Berkeley establishes the connections between freethinking, the fate of society, misuse of the idea theory of meaning, and the tendency of the time to prioritise mathematical and demonstrative reasoning as superior to all others. To highlight this, Alciphron ends his criticism of grace by telling Euphranor that this demonstrative argument is the reason he hasn't been fully swayed, though he has been influenced by some of Euphranor's moral and practical arguments: 'You are not therefore to wonder that a man who proceeds on such solid grounds, such clear and evident principles, should be deaf to all you can say from moral evidence, or probable arguments, which are nothing in the balance against demonstration' (*Alciphron*, D7 §5). Thus, Alciphron has been in some way moved by Euphranor's arguments appealing to well-being and morality, but he cannot let himself listen to them, knowing that he has this speculative demonstration argument in his mind.

This idea, that people will be unwilling to listen to advice that will improve their well-being and happiness on the basis that mathematical or logical reasoning points in another direction, explains so much of Berkeley's antipathy towards mathematicians, hatred of freethinkers, panic over society and serious pushing of pragmatic thinking. And, in summarising Alciphron's view, Euphranor assigns the Lockean theory to be the decisive factor:

But let me see whether I understand you rightly. You say, every word in an intelligible discourse must stand for an idea; which ideas as far as they are clearly and distinctly¹²⁰ apprehended, so far the discourse has meaning, without which it is useless and insignificant. (*Alciphron*, D7 §5)

It is noteworthy that this is precisely C S Peirce's starting point in one of the first statements of American pragmatism:

Whoever has looked into a modern treatise on logic of the common sort, will doubtless remember the two distinctions between *clear* and *obscure* conceptions, and between *distinct* and *confused* conceptions. They have lain in the books now for nigh two centuries, and are generally reckoned by logicians as among the gems of their discipline. (Peirce C. S., p. CP5.388)

Euphranor moves to a discussion of abstract general ideas,¹²¹ asking if the same can be said for ideas marking the words '*man, triangle, colour*'—do they suggest to the user one particular distinct idea in the way Alciphron demands? Alciphron responds that they are represented by abstract general ideas which represent 'all and none' of the applicable particulars 'at once', which are 'above all others clear and distinct', and, available via introspection. Naturally, they disagree on intuitions on this matter, and Euphranor takes another approach, attempting to use Alciphron's definition of impossibility ('including contradictions') against him. Euphranor asks Alciphron whether it would be possible for an object with the

¹²⁰ It is interesting that Berkeley moves from the Lockean view of the sufficiency of a 'clear idea' to the Cartesian position that demands 'clear and distinct' ideas for significance. Alciphron responds in the affirmative.

¹²¹ It is worth noting at this point that in the third edition of *Alciphron*, Berkeley removed these sections about abstract ideas. It is interesting since it gives some indication of movement in the direction of the Platonic ideas that cause many to judge *Siris* a recantation of elements of Berkeley's empiricism. An examination of this subject is beyond the remit of the current project, on which I am reliably advised by a supervisor who observed that consideration of this very point led to a 100,000 word PhD dissertation in his case.

properties ascribed to abstract general ideas to exist in the world, and Alciphron replies negatively. Euphranor commits Alciphron to a conceivability standard, asking the question: 'Can you frame an idea of what includes a contradiction?' Alciphron responds negatively again, and Euphranor insists that he cannot (and neither can Alciphron, he supposes) form an idea of (e.g.) an abstract general triangle. The existence of an abstract general triangle, he argues, would necessitate the being of an entity that simultaneously manifests all of the mutually excluding (and thus contradictory) properties (obtuseness, acuteness, equilaterality etc.) necessary for the term to extend to all the appropriate particulars in use.¹²² Thus, having the right Lockean idea would require framing an idea which includes a contradiction, and can't be how significance works in (at a minimum) the case of abstract general ideas. Further, Alciphron has argued that without these terms there would be no 'universal science or theorems of any enlargement of knowledge', so, it's a significant loss for the theory.

Berkeley then has Euphranor rehearse his own view, that general terms become general by standing indiscriminately for particulars which resemble each other in some way restricted in the definition or understanding of the term. They agree to move forward with the view that words are signs. Euphranor introduces the 'counter' analogy from signs:

Counters, for instance, at a card-table are used, not for their own sake, but only as signs substituted for money, as words are for ideas. Say now, Alciphron, is it necessary every time these counters are used throughout the whole progress of a game to frame an idea of the distinct sum or value that each represents?' (*Alciphron*, D7 §7)

This makes available a more sophisticated option to the Lockean, according to which there just needs to have been an idea connection at some point. Recall, I have claimed that the *PI* and *MI* accounts come this far in their pragmatism. Berkeley uses the algebra analogy in those works too. On this view, the language user can manipulate and make use of terms even where no idea is available in that

¹²² Peirce on this point: 'Berkeley and nominalists of his stripe deny that we have any idea at all of a triangle in general, which is neither equilateral, isosceles, nor scalene. But he cannot deny that there are propositions about triangles in general, which propositions are either true or false; and as long as that is the case, whether we have an idea of a triangle in some psychological sense or not, I do not, as a logician, care.' (Peirce Papers, p. CP 5.181)

moment, once the value has been fixed initially and may be rediscovered at a later time. So, it need not be the case that words represent ideas every time they are used, but just (in this intermediate step towards Euphranor's full view) that an idea might be supplied 'when there is occasion'. Thus, the universal and ubiquitous character of the availability of the right idea suggested in the Lockean account is weakened to a potential availability.

In section 8, Berkeley presents the beginnings of the more dramatic claim Flew discussed: that words may be meaningful though there is no connection with an idea at all. Euphranor:

There may be another use of words, besides that of marking and suggesting distinct ideas, to wit, the influencing our conduct and actions; which may be done either by forming rules for us to act by, or by raising certain passions, dispositions, and emotions in our minds. A discourse, therefore, that directs how to act or excites to the doing or forbearance of an action may, it seems, be useful and significant, although the words whereof it is composed should not bring each a distinct idea into our minds. (*Alciphron*, D7 §8)

Euphranor uses as his first example ideas representing active entities. Ideas must be inactive, he says, and therefore words denoting active principles cannot be signified by ideas. Berkeley reminds of the contrast he is forging by having Alciphron note that this view is a departure from the norm: 'And yet it is a current opinion, that every substantive name marks out and exhibits to the mind one distinct idea separate from all others' (*Alciphron*, D7 §8). Further, Alciphron is made to realise that this is the case with the term 'number', one of the fundamental concepts of mathematics—ostensibly the discipline serving as the exemplar of the freethinkers' method. Alciphron:

Can it be so hard a matter to form a simple idea of number, the object of a most evident demonstrable science? Hold, let me see, if I can't abstract the idea of number, from the natural names and characters, and all particular numerical things. Upon which *Alciphron* paused a while and then said: To confess the truth I do not find that I can. (*Alciphron*, D7 §8)

To naturalise the phenomenon, Berkeley uses the term 'force' as it appeared in natural philosophy discussions at the time to show how what can be said for 'grace' can be applied equally in a scientific case. Alciphron begins with a notion of force

defined as ‘that in bodies which produces motion and other sensible effects’. (*Alciphron*, D7 §9) Euphranor asks if force is distinct from its effects, and though Alciphron believes it must be, he concedes he cannot form an idea of it in isolation from its subjects and consequences. To add to the issue, there were numerous debates in the period about the nature of force, and whether it is passive or active (Leibniz’s and Newton’s systems of physics use different understandings of force).¹²³ Berkeley lays out some of the various conceptions and potentially equivalent concepts and subtypes (*vis inertia*, *vis insita*, *vis impressa*, *vis mortua*, *vis viva* etc.), stating that ‘strange paradoxes have been framed about its nature, properties, and proportions (...)’. Having listed further issues and somewhat summarised the dispute, Euphranor finishes:

Upon the whole therefore, may we not pronounce, that excluding body, time, space, motion and all its sensible measures and effects, we shall find it is as difficult to form an idea of force as of grace. (*Alciphron*, D7 §9)

This connects interestingly to Berkeley’s assessment of the language around ‘force’, ‘attraction’ and similar terms in *De Motu* (particularly §17):

‘Force’, ‘gravity’, ‘attraction’, and words of this sort are useful for reasonings and computations concerning motion and bodies in motion, but not for understanding the simple nature of motion itself, or for designating so many distinct qualities. (*De Motu*, §17)

Though both Euphranor and Alciphron agree that the term ‘force’ represents no clear and distinct idea, they agree that there are respectable propositions and theorems utilising the term.¹²⁴ That that word retains significance is important—it is one of the fundamental principles in physics and plays a role in many ‘useful truths’. On what grounds, then, is it to be admitted? The role it plays in its system:

¹²³ ‘The publication of Leibniz’s article [*Brevis Demonstratio erroris memorabilis Cartesii et aliorum circa legem naturalem...*(1686)] marks the beginning of the “*vis viva* controversy”, a dispute which occupied the attention of most European natural philosophers for about fifty years. By and large, affiliations in the dispute went by nationalities, with English Newtonians and French Cartesians following the “old opinion” (that “force” is proportional to mass times velocity), while Dutch, German and Italian scientists favoured the “new opinion” put forward by Leibniz.” (Papineau, 1977, p. 111) This dispute focused primarily on the calculation of force, but there was also disagreement about how to understand the metaphysics of force.

And if, by considering this doctrine of force, men arrive at the knowledge of many inventions in mechanics, and are taught to frame engines, by means of which things difficult and otherwise impossible may be performed; and if the same doctrine, which is so beneficial here below, serves also as a key to discover the nature of the celestial motions; shall we deny that it is of use, wither in practice or in speculation, because we have no idea of force? (*Alciphron*, D7 §10)

Interestingly, C S Peirce also uses force as a favourite example of a term where philosophers have obsessed over ideas and definitions and have been mistaken in looking beyond use and effects for some essential definition or nature:

This leads us to undertake an account of the idea of Force in general. (...) According to our rule, we must begin by asking what is the immediate use of thinking about force; and the answer is, that we thus account for changes of motion. (...) (Peirce C. S., 1997, p. 38)

Peirce goes on to explain how the intervention of forces affects motion and how the rules of the parallelogram of forces describe the relevant geometry:

In how many profound treatises is not force spoken of as a "mysterious entity," which seems to be only a way of confessing that the author despairs of ever getting a clear notion of what the word means! (...) The idea which the word force excites in our minds has no other function than to affect our actions, and these actions can have no reference to force otherwise than through its effects. Consequently, if we know what the effects of force are, we are acquainted with every fact which is implied in saying that a force exists, and there is nothing more to know. The truth is, there is some vague notion afloat that a question may mean something which the mind cannot conceive; and when some hair-splitting philosophers have been confronted with the absurdity of such a view, they have invented an empty distinction between positive and negative conceptions, in the attempt to give their non-idea a form not obviously nonsensical.¹²⁵ (Peirce C. S., 1997, p. 41)

Berkeley agrees that we should look to what the term is used for, and stop the speculative obsession with finding the one idea it represents. He also argues (by parity of reason) that the same criteria should be allowed to rescue grace from the similar objections it faces—don't worry that religious experts disagree on its correct

¹²⁵ Peirce makes clear that he regards Berkeley as an 'architect' of the system of pragmatism he endorses: 'In 1871, in a Metaphysical Club in Cambridge, Massachusetts, I used to preach this principle as a sort of logical gospel, representing the unformulated method followed by Berkeley, and in conversation about it I called it 'Pragmatism.' Other references to his role in Peirce's thinking on pragmatism can be found in CP 6.490, CP 7.161, and CP 8.7.

interpretation, but concentrate on the role it plays in the life and acts of the believer. This settles Euphranor's position on concepts like force and grace where they seem to represent no clear idea (because they are thought abstract and no idea can represent a general abstraction, or, where there is great disagreement on their definitions so that it's not clear which particular one you should conceive). But there are more difficult terms than grace and force, as Alciphron remarks:

[B]y all the rules of right reason, it is absolutely impossible that any mystery, and least of all the Trinity, should really be the object of man's faith. (*Alciphron*, D7 §10)

For Alciphron, there is an important difference between terms whose definitions or concepts mean that it's difficult to pick one correct or sufficiently general idea, and terms whose definitions entail contradictory content. If I define a new term and stipulate its definition as something that is 'both green and non-green' it's not clear how we could understand such an entity, or ever say we are using it meaningfully. Relating it to Berkeley's 'counters analogy', it's not obvious how we could get that counter 'into play' in the first place. On the assumption that the other counters had some idea-value at the cash-in point, this new term would be problematic because the value of the counter relative to the other counters would be incomparable.¹²⁶

The traditional understanding of the Trinity relies on a definition which entails a contradiction. Augustine's statement of the nature of the Trinity makes the conceptual tension most clear:

There is the Father and the Son and the Holy Spirit—each one of these is God, and all of them together are one God; each of these is a full substance and all together are one substance. The Father is neither the Son nor the Holy Spirit, the Son is neither the Father nor the Holy Spirit, the Holy Spirit is neither the Father nor the Son, but the Father is purely the Father, the Son purely the Son, and the Holy Spirit the Holy Spirit.¹²⁷ (Augustine & Green, 1995, p. 17)

¹²⁶ It is interesting that this is Berkeley's preferred analogy in introducing the beginnings of his pragmatic theory when 'cash-value' becomes such an important tool in James's explanation of his thinking later.

¹²⁷ Berkeley's more succinct version reads 'a man may believe the doctrine of the Trinity, if he finds it revealed in Holy Scripture, that the Father, the Son, and the Holy Ghost are God, and that there is but one God' (*Alciphron*, D1 §11).

We are left with the following situation: three entities are each numerically identical with one further one, but none of the three numerically identical ones is identical to any other of the two. That this amounts to a scenario where $a = b$ and $a \neq b$ is easily demonstrated.¹²⁸ Perhaps, though the orthodox opinion requires a literal interpretation of these identity claims, one can understand the term Trinity sufficiently well once one understands the ‘doctrine of a Creator, Redeemer, and Sanctified makes proper impressions on his mind’. One can endorse the traditional conception of the Trinity as true, while understanding it in these more practical terms, which, according to Berkeley, produce in the believer ‘love, hope, gratitude, and obedience’ and thereby it becomes ‘a lively operative principle influencing his life and actions, agreeably to that notion of saving faith which is required in a Christian.’ (*Alciphon*, D7 §11)

Again finding a secular comparison case, Euphranor introduces the issue of personal identity, asking if the freethinker would regard the notion of personhood *simpliciter* as so much less difficult than that the case of divine personhood represented by the Trinity. Alciphron locates personhood in continuity of consciousness—again espousing the Lockean orthodoxy—and states that no mysteries arise in this account. Euphranor then makes the objection now known as ‘the Reid objection’ to Locke’s ‘Memory Theory’ of identity.¹²⁹ Euphranor argues that Locke’s theory can be used to generate an inconsistent trio of identity statements. Given the relations of their memories, three persons A, B, C end up standing in the following relationships: $A=B$, $B=C$, and $A \neq C$. The transitivity of identity means that this cannot be numerical identity, and the situation is shown to have a problematic underlying logic in much the same way as the Trinity.

Alciphron concedes puzzlement and Euphranor muses on whether faith is equally available to the freethinker in this issue. Euphranor asks if the secular notions of fate and chance don’t admit a kind of ‘practical faith or assent’ which explains how people (freethinkers and common men) find confidence in matters

¹²⁸See Martinich (1978, pp. 171-173).

¹²⁹The objection is attributed to Reid given his presentation of it in ‘Essay Three: On Memory’ in *Essays on the Intellectual Powers of Man* (1781). It responds to Locke’s discussion of personal identity in the chapter ‘Of Identity and Diversity’ (*Essay*, II xvii §1-29).

where no abstract, precise explanations are available. A key thought in *Alciphron* and *The Analyst* is that the freethinker is *as fair* a target of criticism on matters of faith as the religious believer. Berkeley will claim that it can only be something akin to faith that allows the freethinker (especially the mathematics-admiring freethinker) to proceed with his endorsement of calculus despite the problems with its foundations, and the counterintuitive suppositions it demands. Perhaps, as in the religious case, people venerate Newton's scientific and mathematical aptitude so fully that they defer to his wisdom, presuming that what seems to them contradictory is resolvable in as great a mind as Newton's. Some things are above our reasoning, but not above that of a superior intellect, perhaps. In the case of personal identity, Euphranor suggests that the freethinker is happy to persist with the Lockean theory even though the way it is set up admits paradoxes and contradiction:

There is, if I mistake not, a practical faith, or assent, which shows itself in the will and actions of a man, although his understanding may not be furnished with those abstract, precise, distinct ideas, which, whatever a philosopher¹³⁰ may pretend, are acknowledged to be above the talents of common men; among whom, nevertheless, may be found, even according to your own concession, many instances of such practical faith, in other matters which do not concern religion. (*Alciphron*, D7 §12)

Duddy, in 'Toland, Berkeley and the Irrational Hypothesis' (1999), argues that Toland's response to the irrational scenario highlighted by Locke's position on the relationship of reason and faith is much more sensible than Berkeley's 'fideist' response:

Toland, on the face of it, seems to be right about the relationship between belief (or assent) and understanding, and also about the relationship between adoration and understanding. He is right, in other words, to condemn the irrational hypothesis in both its extreme and moderate forms; and Berkeley is mistaken in attempting to defend it in the way that he does, by severing the relationship between words

¹³⁰ Here, Berkeley seems to be distancing himself from not just the speculative philosopher, but the contemporary notion of philosopher itself. *Alciphron* contains a sustained emphasis on the idea that a return to more practical thinking is vital, and that the contemporary philosophers, in their admiration for mathematics and logic, have moved too far away from ordinary, common thinking. Perhaps this general point explains the fact that Berkeley chooses to have his advocate in the dialogue be an amateur philosopher, who is a scholarly man, but a farmer by trade.

and ideas, between credulous response and intellectual understanding. (Duddy, 1999, p. 61)

Duddy primarily draws from the earlier material in the seventh dialogue, and thus describes Berkeley's position as fideist. If we take the traditional understanding of fideism as the position that faith may be independent from and even adversarial towards reason, it's understandable that Berkeley might be read that way. But his position is much more nuanced than this: he is not merely saying, in cases where faith should be the main driver in belief, ignore rational counter-evidence. What Berkeley wants is—in the cases of doctrines or concepts where a purely rational understanding is strained or impossible, look to the context and actual use of the concept. If, like force and grace, the best understanding of the concept arises out of observing its role in the systems in which it is deployed, then that should be how its meaningfulness is understood.

It's not about ignoring the rational criteria, for in the case of personal identity and the Trinity, they are still the defining criteria—it's about integrating the concept into its context of use, and looking to its practical function to interpret the definition. Though you cannot represent a clear idea of an entity with the identity relations necessitated by the Trinity (or Lockean personal identity), you can look to application and see that a Trinitarian God plays a role in the way believers relate of God, (or that psychological continuity is what matters in the forensic issues (blame, reward, trust etc.) that Locke's theory seeks to answer).

In sections 12 and 13, Berkeley hands the apologetic reins over to Crito, to emphasise that the current argument is not simply the clever thinking of a philosopher, but the style of belief recommended by the Church. Crito thinks that the freethinkers believe otherwise and conflate the conventional thought of the church with the Scholastic philosophers—he argues instead that the philosophers of the freethinking sect approach the 'perplexities, chimeras, and inconsistent ideas' of the Scholastics much more nearly than the contemporary Church does. Again, the anti-abstract, practical approach is emphasised and celebrated: 'Who does not see that such an ideal abstracted faith is never thought of by the bulk of Christians, husbandmen, artisans, or servants? Or what footsteps are there in the Holy Scripture to make us think, that the wiredrawing of abstract ideas was a task

enjoined either Jews or Christians?’ (*Alciphron*, D7 §12) Again, we may recall the previously quotes passages from *SIS*.

In response to Alciphron’s insistence that all of the various Church councils on the subject of the Trinity show that the Christians are as speculative a group as any, Crito insists that such councils were really intended to prevent the wrong interpretation of the Trinity encouraging the naïve to adopt polytheism or Sabellianism (the view that the three Godheads are but modes of one entity). Crito even admits that Church scholars have gone too far and failed to heed Jerome’s lesson: “‘Why after so many centuries do you pretend to teach us what was untaught before? Why explain what neither *Peter* nor *Paul* thought necessary to be explained?’” (*Alciphron*, D7 §12)

Thus, Crito distinguishes the position of Euphranor from fideism by explaining that it is not that faith is at odds with understanding, but that faith is an act of will or a kind of devotion, which depends on understanding, but involves different processes. Faith is ‘suited even to vulgar capacities, placed in the will and affections rather than in the understanding, and producing holy lives, rather than subtle theories’ (*Alciphron*, D7 §12). This is in complete concert with Berkeley’s own homiletic work in the surrounding period:

BUT when Life and Immortality were brought to Light by the Gospel, there could remain no Dispute about the chief End and Felicity of Man, no more than there could about the Means of obtaining it, after the express Declaration of our Blessed Lord in the Words of my Text; *This is Life eternal, that they may know thee, the only true God, and Jesus Christ whom thou hast sent.* For the right understanding of which Words we must observe, that by the Knowledge of God, is not meant a barren Speculation, either of Philosophers or Scholastic Divines, nor any notional Tenets fitted to produce Disputes and Dissentions among Men; but, on the contrary, an holy practical Knowledge, which is the Source, the Root, or Principle of Peace and Union, of Faith, Hope, Charity, and universal Obedience.

A Man may frame the most accurate Notions, and in one Sense attain the exactest Knowledge of God and Christ that human Faculties can reach, and yet, notwithstanding all this, be far from knowing them in that saving Sense. (*SIS*, 250)

Not only is Berkeley advocating strongly for the superior importance of a deeply practical faith—perhaps one suitable to the people, like those of Bermuda, whose

conversion had been his great plan—but he seems openly hostile to the speculative approach:

The Christian religion was calculated for the Bulk of Mankind, and therefore cannot reasonably be supposed to consist in subtle and nice Notions. From the Time that Divinity was considered as a Science, and human Reason enthroned in the Sanctuary of God, the Hearts of its Professors seem to have been less under the Influence of Grace. From that Time have grown many unchristian Dissensions and Controversies. (*SIS*, 261)

Here it is clear that Berkeley thinks speculative, nice, scientific approaches to religion are damaging the influence of grace, and are positively correlated with ‘Dissensions and Controversies’ in the church. It is important to note this emphasis, in light of how he will go on to compare the case of Christian mysteries (and practical faith therein) and that of mathematical items at the end of §17. Though in that section of §17 he is referring to the root of a negative square, Dialogue 7 sees him generalise the case with algebraic items to the all numerical terms (§8), and specifically mention the consequences of a failure to do so in the specific case of infinitesimals (§18).

What I take to be the decisive components of my reading of *Alciphron* and *The Analyst* and their relationship take place across sections 14, 15, 16, 17 and 18. In these sections, Euphranor—uninterrupted—delivers the final words on his view of language, and the importance of signs and linguistic practice (with which Alciphron ultimately agrees). I think it is crucial to flag at the outset that I find these remarks to be decisive on the matter of the treatment of infinitesimals because: 1) they are his final words on the theory of language that the whole chapter (and in many ways, the whole book) has been leading up to; 2) they involve two whole sections of discussion of mathematical terminology and notation as a model case, so that any doubt that the remarks apply equally to mathematics should be erased; and 3) the last section makes *explicit* reference to ‘infinitesimals’ (alongside a host of other semiotically tricky entities) as an example appropriate to what he has been saying of language in the preceding sections.

Euphranor begins by explaining the role of the mind and contemplation in parsing and understanding language:

It is not therefore by mere contemplation of particular things, and much less abstract general ideas, that the mind makes her progress, but by an apposite choice and skilled management of signs: for instance, force and number, taken in concrete with their adjuncts, subjects, and signs, are what every one knows: and considered in abstract, so as making precise ideas of themselves, they are what nobody can comprehend. That their abstract nature, therefore, is not the foundations of science, is plain; (...) nothing being more evident, than that one, who can neither write nor read, in common use understands the meaning of numeral words, as well as the best philosopher or mathematician. (*Alciphron*, D7 §14)

Expanding the example of numbers, Berkeley discusses notation, symbolism and semiotics. We understand numbers by recognising numerical symbolism, by understanding certain primitive mathematical operations, and by remembering certain general rules. So, we understand less intuitive number words like 'zero' and symbols like '0', not by considering an absence in numerical terms in the abstract or by thinking of concrete instances of zero objects, but by thinking of the relationship between '0' and the other numerals.

To understand communication involving '0' is to know the role and position it occupies in the numerical system. It's to know that it is the kind of thing that, if added to or subtracted from another number, makes no difference to the value of that other number. It is to understand that multiplying it and dividing by it are very special mathematical operations. The sophisticated mathematician is working at the level of signs in arithmetic, not needing to consider the numbers as though they are fundamentally potential predicates of objects. In algebra, the break between the sign and its potential objects is more intentional and obvious, and that's how generality is achieved. According to Berkeley, ordinary language is like this—words are arbitrarily and conventionally applied to objects and concepts, and the preoccupation with necessary conditions and clear and distinct ideas obscures this fact.

As arithmetic and algebra are sciences of great clearness, certainty, and extent, which are immediately conversant about signs, upon the skilful use and management whereof they entirely depend, so a little attention to them may possibly help us to judge of the progress of the mind in other sciences; which, though differing in nature, design, and object, may yet agree in the general methods of proof and enquiry. (*Alciphron*, D7 §15)

Berkeley discusses his doctrine of signs, explaining that words and notations are signs, and that much clarity may be achieved by concentrating on this aspect of language and its purpose. It may also provide ‘a genuine solution of many difficulties’ in cases where obsession with ideas and logical consistency seem to show that terms people know and understand to have value in lived experience, are empty. Thus, he explains the problem and sums up his recommendations for how to handle such cases:¹³¹

Thus much, upon the whole, may be said of all signs: (...) that they have other uses besides barely standing for and exhibiting ideas, such as raising proper emotions, producing certain dispositions or habits of mind, and directing our actions in pursuit of that happiness, which is the ultimate end and design (...) that sets rational agents at work: that the true end of speech, reason, science, faith, assent, in *all its degrees*, is not merely, or principally, or always the imparting or acquiring of ideas, but rather something of an active, operative nature, tending to a conceived good; which may sometimes be obtained, not only although the ideas marked are not offered to the mind, but even *although there should be no possibility of offering or exhibiting any such idea to the mind*. For instance the algebraic mark, which denotes the root of a negative square, has its use in logistic operations, although it be impossible to form an idea of any such quantity. And *what is true of algebraic signs, is also true of words or language* (...). [E]ven the mathematical sciences themselves, which above all others are reckoned the most clear and certain, if they are considered, not as instruments to direct our practice, but as speculations to employ our curiosity, will be found to fall short in many instances of those clear and distinct ideas, which, it seems, the minute philosophers of this age, whether knowingly or ignorantly expect and insist upon in the mysteries of religion. (*Alciphron*, D7 §17)

Taking the example of the imaginary i in (e.g.) the $8i$ that would be the result of the operation $\sqrt{-64}$ (or ‘the square root of minus sixty four’), Berkeley explains that it is of no consequence that it is literally impossible to form a clear and distinct idea of the referent of that notation. There simply is no ‘normal’ value that can solve the equation—no squared real number can produce a negative number. Yet, it may be necessary, in the management of an equation, to appeal to an imaginary number

¹³¹ The whole of the next two sections could be quoted here, as they are the fundamental theses of Berkeley’s views on this topic, but I have tried to trim them down to the most essential thoughts. The italics are mine: I use them to emphasise the generality of these recommendations, and the extent to which they represent a departure from the *Pi* and *MI* material.

as an intermediary step between more natural values. Or, you may wish to use the symbolism to make a point about incomparability. The central thought is that people who are inclined to think about its meaning know that it has meaning by considering its use—by understanding that it is a kind of placeholder, that it symbolises the product of a specific kind of operation that is useful to mathematicians in deriving results applicable in practice (e.g. symbol processing, electrical circuitry and any part of applied science benefiting from the solution of quadratic equations). In that case, to delegitimise the notation or concept on the grounds that it represents no clear idea, is not only to do something impractical and deleterious to social goals, but to completely miss the point of the thing.

This same analysis must apply to infinitesimals. Not only does Berkeley say it must apply to all mathematics, but to all *words*. If a term's meaningfulness is established in its application in use, then criticising it on the grounds that it fails to represent a clear idea, or because its definition may produce contradictory content, is insufficient to discredit it. It is helpful to see just how close Berkeley's thinking is to classically pragmatist thinking here. This is James, discussing the fundamental idea of pragmatism, as a philosophical outlook:

The pragmatic method in such cases is to try to interpret each notion by tracing its respective practical consequences. What difference would it practically make to anyone if this notion rather than that notion were true? If no practical difference whatever can be traced, then the alternatives mean practically the same thing, and all dispute is idle. (...) Mr. Peirce, after pointing out that our beliefs are really rules for action, said that, to develop a thought's meaning, we need only determine what conduct it is fitted to produce that conduct is for us its sole significance. (...) To attain perfect clearness in in our thoughts of an object, then, we need only consider what conceivable effects of a practical kind the object may involve—what sensations we are to expect from it, and what reactions we must prepare. (James, *What Pragmatism Means*, 94-95)

Turning to pragmatism's relationship to empiricism, James shows that pragmatism is really just a 'more radical' and 'less objectionable' form of that historical doctrine.

A pragmatist turns his back resolutely and once for all upon a lot of inveterate habits dear to professional philosophers. He turns away from abstraction and insufficiency, from verbal solutions, from bad *a priori* reasons, from fixed principles, closed systems, and pretended absolutes and origins. He turns towards concreteness and adequacy,

towards facts, towards action, and towards power. (James, *What Pragmatism Means*, 97)

Looking to Peirce's engagement with the same issue in Berkeley, a wonderfully confusing picture emerges from the following quote. 1) It shows Peirce read early Berkeley (and felt his pragmatism directly influenced by it), 2) it shows he never read *Alciphron*, or, at least did not read it carefully, and 3) it shows that someone (unwittingly) sharing Berkeley's late opinions, regards the examples of imaginary roots and infinitesimals as equivalent under the analysis. Here, he discusses Berkeley's early philosophy's use of conceivability and ideas:

As for that argument which is so much used by Berkeley and others, that such and such a thing cannot exist because we cannot so much as frame the idea of such a thing, -- that matter, for example, is impossible because it is an abstract idea, and we have no abstract ideas, -- it appears to us to be a mode of reasoning which is to be used with extreme caution. (...) If such arguments had prevailed in mathematics (and Berkeley was equally strenuous in advocating them there), and if everything about negative quantities, the square root of minus, and infinitesimals, had been excluded from the subject on the ground that we can form no idea of such things, the science would have been simplified no doubt, simplified by never advancing to the more difficult matters. (Peirce C. S., p. CP8.33)

Finally, to make the connection in Berkeley explicit, he even cites the infinitesimal as an example of a case in which the method just described in §17 should be adopted:

Be the science or subject what it will, whensoever men quit particulars for generalities, things concrete for abstractions, when they forsake practical views, and the useful purposes of knowledge for barren speculation, considering means and instruments as ultimate ends, and labouring to obtain precise ideas which they suppose indiscriminately annexed to all terms, they will be sure to embarrass themselves with difficulties and disputes. Such are those which have sprung up in geometry about the nature of the angle of contact, the doctrine of proportions, of indivisibles, *infinitesimals*, and divers other points; notwithstanding all which, that science is very rightly esteemed an excellent and useful one, and is really found to be so in many occasions of human life; wherein it governs and directs the actions of men, so that by the aid of influence thereof those operations become just and accurate, which would otherwise be faulty and uncertain. (*Alciphron*, D7 §18)

The considerable weight of evidence from *Alciphron* suggests that Berkeley is, in his mature philosophy, committed to a broad semantic pragmatism which legitimates concepts such as the infinitesimal on the grounds provided by their practical value and contribution to effective science and general well-being. That this emphasis on valuing pursuits which benefit people and society is the central theme of this book means that this is a moment of crucial importance in this phase of his philosophy. That Berkeley specifically names infinitesimals as an example where this approach is obviously beneficial should really make us think about whether the diatribe against infinitesimals in *The Analyst* should be read as a sincere piece of philosophy—a turn towards ‘barren speculation’. In describing the work of those who fail to take this approach to matters of public importance Berkeley says: ‘As to the perplexity of contradictions and abstracted notions, in all parts whether of human science or divine faith, cavillers may equally object, and unwary persons incur, while the judicious avoid it.’ (*Alciphron*, D7 §18) Lastly, I think this is further confirmed by his thoughts on God’s role in this at the time:

In the contrivance of Vision, as that of other things, the wisdom of Providence seemeth to have consulted the operation rather than the theory of man; to the former things are admirably fitted, but, by that very means, the latter is often perplexed. For, as useful as these immediate suggestions and constant connexions are to direct our actions ; so is our distinguishing between things confounded, and as it were blended together, no less necessary to the speculation and knowledge of truth. (*TVV* §36)

2.6

Experiments in Literary Form: Berkeley’s ‘Satirical Nature’¹³²

It is important to note the great variety of ways Berkeley approached philosophical topics in his written work since it is fundamental to understanding his rhetorical

¹³² See N634.

capacities.¹³³ Showcasing this aspect of Berkeley—that he was a versatile and colourful rhetorician—is important to my project since I am suggesting that work that may be read as serious and dry ought to be read as sarcastic and rhetorical. This tendency toward the satirical and bombastic is noted by Walmsley as a philosophical trait that Berkeley struggled to suppress early in his career, especially in the writing of the *Principles*:

With his plain style Berkeley begins to adumbrate for us the *persona* of the *Principles*, one who is interested in communicating the truth, a clear thinker, and above all a man of common experience and common sense (...).

In all his anxiety to convey something of his own conviction, Berkeley recognized as well the danger of excess: ‘No mention of fears & jealousies, nothing like a party’ (PC 789), and ‘N.B to rein in y^r Satyrical nature.’ (PC634) Too much indignation or a lapse into anger would destroy the rational integrity of his argument. Where Descartes dramatizes his acquisition of truth, Berkeley tries to show a man secure in the possession of it. (Walmsley, 1990, p. 28 & 30)

After the heroic period, we witness Berkeley embrace a more holistic approach, significantly varying the way he presents his work—for example, re-casting the *Principles* material in a lighter dialogue style in the *Dialogues*. By the mid-1710s, he is writing more satirical pieces for the *Guardian*, having overcome some of his worries about sounding too confident, and perhaps learning to regard a ‘Satyrical nature’ in a more positive light. Later again, we see Berkeley in *Alciphron* celebrating linguistic variety, taking the example given in Scripture, along the following lines:

O *Alciphron*! If I durst follow my own judgement, I should be apt to think there are noble beauties in the style of the Holy Scripture: in the narrative parts a strain so simple and unaffected: in the devotional and prophetic so animated and sublime: and in the doctrinal parts such an

¹³³ Walmsley’s *The Rhetoric of Berkeley’s Philosophy* (1990) is an important source on this topic. However, Walmsley’s focus is on the texts of the heroic period and *Siris*. He has a short chapter on *Alciphron*, but many of the texts that I think best demonstrate Berkeley’s rhetorical tendencies are treated very briefly. In what follows I use Walmsley’s insights where possible, and try to supplement them with my own considerations on these less focal texts.

air of dignity and authority as seems to speak their original divine.
(*Alciphron*, D6, §6)¹³⁴

This response to Scripture also captures something of Berkeley's own eventual appreciation of language and its power to communicate matters of importance. He was clearly aware that literary style could play a role in the way an ideological message was received.¹³⁵ The following discussion of Berkeley's associations with various personalities and aspects of the London satire and criticism culture of his age will, I hope, prime the reader for the reading I offer of *The Analyst* in the following chapters. Perhaps more than any other philosopher of the early modern period, Berkeley experimented significantly with literary form.¹³⁶ His poem, that gave UC Berkeley, California its name, is well known for its concluding stanza:

Westward the course of empire takes its way;
The first four acts already past,
A fifth shall close the drama of the day;
Time's noblest offspring is the last. (Verses on America, 1957)

This was not a sole foray into poetry. After the publication of *Defence of Freethinking in Mathematics*—Berkeley's response to the Newtonian John Jurin after *The Analyst*—Jurin finds mention in his later poetry (which he has Prior publish anonymously in London, and where there is a clear intention to obscure his

¹³⁴ Berkeley argues for the interpretation of the Bible as a divine revelation in Dialogue 6 of *Alciphron*. For discussion of these arguments see Jakapi (2010).

¹³⁵ In *The Rhetoric of Berkeley's Philosophy*, Walmsley argues that it is this kind of engagement with Scripture that shows Berkeley the limitations of the Lockean picture of language: 'Berkeley's linguistic theory and rhetorical practice also display the priorities of an Anglican divine. It is as an expositor and defender of Scripture that Berkeley comes to explore the non-cognitive functions of language. It is in puzzling over how we understand Paul's promise of 'good things' that he discovers, in the Introduction to the *Principles*, that some language is primarily emotive. (...) Berkeley's work everywhere celebrates the truth and power of Scripture. (...) In its varied tones and styles Scripture is the pattern and authority for a language in which truth becomes 'an operative principle' directing our lives.' (Walmsley, 1990, p. 189)

¹³⁶ Berkeley also experimented with literary persona. In many of his public writings (e.g. those in Steele's *Guardian*, the poem about Jurin and tar water, various letters to the *Dublin Journal*) he keeps his identity unknown, or invents a literary name and writes *pro hominem*. This tendency in early modern writing is addressed by Haakonssen in the introduction of his recent work on Holberg (Haakonssen K. , 2017, pp. 14-16). A good example can be seen in Berkeley's letters about military dress to the *Dublin Journal* on behalf of 'Eubulus'. Berkeley understood the power of association and wanted the success of that project at the forefront of certain reader's minds while considering his related suggestion.

authorship).¹³⁷ T. E. Jessop was obviously embarrassed by some of Berkeley's poems and introduces them, in a section waved away with the name '*Varia*', as follows:

These trifles are included for the sake of completeness. Berkeley would not have wished the verses to be preserved. That he could versify better is shewn by his well-known little poem on America. (Berkeley & Jessop, 1953, p. 223)

In addition to his enthusiasm for poetry, Berkeley wrote two stylistically different philosophical dialogues.¹³⁸ He wrote works with a scientific focus (*NTV* and *De Motu*), a work of mysticism and medicine (*Siris*), and he adopted the queries style, made popular by members of the Royal Society, when offering his views on economy and money in *The Querist*. He also allowed himself to be influenced by the satirical pamphlet and journal culture of his time—a period fairly universally regarded as the best for satire in the history of the English language.^{139,140} Further, Berkeley was moving in the same social circles as Alexander Pope and Jonathan Swift, and was friendly with both men. Here, I raise some of the aspects of their work that influenced Berkeley in the period prior to *The Analyst*.

¹³⁷ To drink or not to drink! that is the doubt,
With *pro* and *con* the learn'd would make it out.
Britons, drink on! The jolly prelate cries:
What the prelate persuades the doctor denies.
But why need the parties so learnedly fight,
Or choleric *Jurin* so fiercely indite?
Sure our senses can tell if the liquor be right.
What agrees with his stomach, and what with his head,
The drinker may feel, though he can't write or read.
Then authority's nothing: the doctors are men:
And *who drinks tar-water will drink it again.* (Hight, 2012, p. 470)

¹³⁸ Walmsley notes how well suited the perceptual themes of the *Dialogues* were to the dialogue form: 'The genre presents itself as a record of the conversation of particular people in an actual setting. Berkeley's thesis, which attends to matters of perception, may thus easily prove itself in specific sensory experiences. We 'see' Hylas and Philonous test their hypotheses on the world around them (...).' (Walmsley, 1990, p. 66)

¹³⁹ 'It is common place that satire flourished in first- and second-century Rome (at the time of Perseus and Juvenal), briefly in the late sixteenth century in England (Donne, Marston, and Hall), the seventeenth century in France (Regnier and Boileau) and the eighteenth century in England (Pope, Swift et al.).' (Griffin, 1994, p. 133)

¹⁴⁰ The Berkeley family book auction manuscript contains many works of satire, including those of Pope and Swift, but also of less central figures such as Samuel Butler.

Berkeley met Pope through Richard Steele and Joseph Addison. Steele and Addison were very influential in London's political publishing world and had commissioned letters and articles from Berkeley and Pope for their magazines. Berkeley's letter to Pope of May 1714 shows his enthusiasm for Pope's literary talents, and subsequent letters suggest that Berkeley may have stayed at his residence more than once.¹⁴¹ Pope is known to have written the following lines about Berkeley in his *Epilogue to the Satires*:

Ev'n in a bishop I can spy desert
Secker is decent, Rundel has a heart;
Manners with candour are to Benson giv'n,
To Berkley ev'ry virtue under heaven. (Pope, 1956, p. Epilogue)

Berkeley admired Pope's satirical work enormously, as is clear from the following letter from Italy, opening with Berkeley's glowing thoughts on the *Rape of the Lock*. The excerpt also suggests his wider reading of Pope's work and documents Berkeley's enthusiasm to maintain an acquaintance with the man:

I have accidentally met with your *Rape of the Lock* here, having never seen it before. Style, painting, judgement, spirit, I had already admired in your other writings, but in this I am charmed with the magic of your invention, with all those images, allusions, and inexplicable beauties which you raise so surprisingly, and at the same time so naturally out of a trifle. And yet I cannot say that I was more pleased with the reading of it, than I am with the pretext it gives me to renew in your thoughts the remembrance of one who values no happiness beyond the friendship of men of wit, learning, and good nature. (Hight, 2012, p. 113)

The *Rape of the Lock* is an example of parodical mock-heroic style, in which the high style of epic narrative is used to emphasise the relatively tawdry or trivial nature of some described event. Berkeley's journeys to the pineal gland in Steele's *Guardian* use related techniques. In the journey to (what we are led to believe is) Anthony Collins's mind, we have the introduction of the character 'Ulysses Cosmopolita', a name presumably chosen to ridicule the freethinker by suggesting the silliness of an epic traveller journeying to such a disappointing and ridiculous locale. It also invokes the imagery of mythology, with its guarded fortress metaphors, and the descriptions of the stirring up of an army of emotions and passions serving under

¹⁴¹ See Hight (2012, 616 and letters 65, 69, 90 and 97).

vanity (and ultimately an anthropomorphic rendering of atheism). Similarly, Berkeley's allegory of the freethinking fly buzzing around inside St Paul's Cathedral uses similarly dramatic contrast of the spectacular with the mundane.¹⁴²

Berkeley and Jonathan Swift met in 1713 and Berkeley described him to Percival in glowing terms:

Dr. Swift's wit is admired by both of them [Addison and Steele], and indeed by his greatest enemies; and if I were not afraid of disoblising my Lady and Mrs Parker I should tell you that I think him one of the best natured and agreeable men in the world. (Hight, 2012, p. 85)

Both Swift and Berkeley began contributing to the *Guardian* in March, 1713. Swift wrote to the lord lieutenant of Ireland in support of Berkeley's Bermuda plan—that this letter of endorsement came in 1724 testifies to the longevity of their friendship. Swift's 'A Modest Proposal' (1729) is one of the preeminent examples of irony in the period.¹⁴³ This satire is divided between a sincere-seeming opening, outlining the nature and state of a problem (the terrible state of Irish poverty, overpopulation and 'idleness'), and the author's satirical suggestion for the solution. The proposed solution is the allocating of 100,000 Irish babies for sale to 'persons of quality and fortune' for the purpose of eating, under the proviso that '[a] child will make two dishes at an entertainment for friends, and when the family dines alone, the fore or hind quarter will make a reasonable dish, and seasoned with a little pepper or salt, will be very good boiled on the fourth day, especially in winter' (Swift, 1996, p. 53).

The benefits and economics of this suggestion are espoused further for the remainder of the satire, as Swift extols the virtue of industrialised cannibalism with great avowed sincerity. Berkeley's blunt and sarcastic treatment of the apparently laudable moral aims of his freethinking opponents in Steele's *Guardian* is reminiscent of this feature of the Juvenalian satire form Swift utilised so ably.

¹⁴² From 'Narrowness of the Freethinker', discussed earlier in this chapter.

¹⁴³ See Wittkowsky (1943) and Quintana (1936). Quintana describes 'A Modest Proposal' as 'not only the greatest of Swift's Irish tracts; it is also the best introduction to his satiric art.' (Quintana, 1936, p. 255)

Another important feature links Swift's text with Berkeley's critical philosophy: 'A Modest Proposal' is also broadly recognised to be specifically directed at a certain kind of arithmetical approach to social and political problems. This approach is typified in William Petty's *Political Anatomy of Ireland* (1691).^{144,145} Sussman describes that approach in the following terms:

It is at this historical juncture, then, that the invasive procedures of political arithmetic began to be understood as most appropriately applied to those at (...) the "social margins." (Sussman, 2004, p. 100)

There was one area of political arithmetic, however, that continued to fascinate British mercantile thinkers even after the Revolution Settlement: the idea that biological reproduction could be aligned with national productivity. (...) Petty's ideas about increasing reproduction through government intervention found many echoes in the work of later economic theorists (...). (Sussman, 2004, p. 103)

The policies of Petty¹⁴⁶ that Sussman has in mind are outlined in private by Petty as including 'dissolving marriages that did not result in children within six months, penalizing women who did not produce a child every three years, and cash rewards for women who could give birth to three children within three years' (Petty W. , 1927, pp. 50-51). In public, he discussed the censuses of Irish people, and the opportunity Ireland provided for experiments in political economy:

In the preface, Petty explains why the subdued and devastated human landscape of seventeenth-century Ireland provides appropriate evidence for his new science of "political economy." He has chosen it "as Students of Medicine practice their inquiries on cheap and common Animals... where there is the least confusion and perplexure of parts." (Sussman, 2004, p. 106)

In a mocking reference to Petty's treatment of the Irish people as arithmetical parts of the trade economy,¹⁴⁷ Swift's modest proposal begins with an excessively

¹⁴⁴ See Sussman (2004), Wittkowsky (1943), and Landa (1942), (1943).

¹⁴⁵ See Petty and Hull (1963) for Petty's central economic ideas, especially *The Political Anatomy of Ireland* (1962) and *Political Arithmetick* (1976).

¹⁴⁶ Sussman also cites Graunt's work on '[t]he animal nature of Irish and American women', in which he argues that the 'civilised' practice of 'affected straightening of their bodies' corresponds to increased levels of mortality of women in childbirth in London, especially when compared with the rates in 'Brutes' who would not affect such a posture: 'What I have heard of the *Irish-women* confirms me herein.' (Sussman, 2004, p. 106)

¹⁴⁷ Sussman notes that Marx credits Petty with discovering "the value form of the product of labour." (Sussman, 2004, p. 103)

mathematical assessment of the various aspects of the problems in the Irish State, one that shows the satirical 'proposer' to identify the previous failures of imperial policy in Ireland with mathematical inadequacies in the approaches of his predecessors: 'As to my own part, having turned my thoughts for many years upon this important subject, and maturely weighed the several schemes of our projectors, I have always found them grossly mistaken in their computation' (Swift, 1996, p. 52). The previous calculations presumed that the solutions to the problem might include population control, or confiscating and exporting for labour (in the form of slave trade), but had failed to consider Swift's *modest* proposal of simultaneously fixing the population and financial situation by selling babies to eat.

Sussman argues that Swift is responding to a new dynamic in colonial ideology, namely, political arithmetic:

The process of calculating the financial worth of a population was known in the eighteenth century as political arithmetic. (...) Swift's tracts about the condition of Ireland provide us with a crucial critical purchase on the rhetorical effects of this new statistical science. (Sussman, 2004, p. 96)

Sussman further emphasises the often absurd attention to technical and mathematical calculations in that literature, giving a number of examples from Petty and John Graunt. She notes that '[t]he emphasis on numbers in this passage, characteristic of the text, helps articulate certain elements of colonialist ideology during the period' (Sussman, 2004, p. 106). Appropriately, there are many examples of strange mathematical formalisms and calculations in 'A Modest Proposal' to emphasise the vacuity of this inappropriately technical and mercantile approach.¹⁴⁸ The 'sting in the tale' of introducing the proposer's solution occurs between two

¹⁴⁸ The assumptions of the proposer are repeatedly costed throughout the progress of the piece: 'at most not above the value of 2 shillings' (Swift, 1996, p. 52), 'I have already computed the charge of nursing a beggar's child (in which list I reckon all cottagers, labourers, and four-fifths of the farmers) to be about 2s per annum, rags included' (Swift, 1996, p. 54). Calculations governing how many babies must be preserved for breeding and other necessary alternative uses, and, how urban versus rural demand will work are considerable given the shortness of the pamphlet, and appear on most pages, including 'Supposing that 1000 families in this city would be constant customers for infants' flesh, beside others who might have it at merry-meetings, particularly at weddings and christenings, I compute that Dublin would take off annually about 20,000 carcasses; and the rest of the kingdom (where probably they will be sold somewhat cheaper) the remaining 80,000.' (Swift, 1996, p. 57)

sets of calculations, possibly to emphasise the sense of inappropriateness of letting calculations dictate an action as grotesque as this. There is something similar in Berkeley's use of satire and sarcasm in *The Analyst*. Berkeley's taking up of his freethinking opponent's position in assessing the calculus is, I argue, supposed to draw attention to the vulnerability of valued systems under that method of analysis. Swift's straight-faced user-manual for an economy of cannibalised and upholstered children was supposed to draw attention to the heartlessness of certain imperial practices in Ireland.¹⁴⁹ To Petty, the Irish were the objects of calculations—barely human.

Berkeley's relation to all of this is complicated. Unfortunately, although Berkeley had disagreements with aspects of Petty's economic outlook, especially his views on money,¹⁵⁰ he was not obviously averse to the application of political arithmetic, at least in name, to the case of the Irish peasant class.¹⁵¹ In fact, in *The Querist*, he seems to call for more of it:

¹⁴⁹ Notwithstanding the point made by 'A Modest Proposal', Swift was certainly not overly sympathetic towards the Irish poor, having written about the annoyance of begging and other poverty-related social ills (as he saw them) in Ireland.

¹⁵⁰ Berkeley's thoughts on money—particularly his desire to 'repudiate the Midas fixation of earlier British writers and to break with the identification of money with gold and silver, conceiving it instead as a 'a ticket or counter'' (Kelly P. , 1985, p. 101)—is one of the topics on which the history of economics have taken him most seriously. For discussion of money and credit, and their role in generating industry in *The Querist*, see Queries 21-47, 218-254, 277-327, 424-450, 458-497 and 555-578. His views on the relationship between consumption in the upper classes and industry in the poor, his thoughts on national banks, and on the importance of the ratio between land and population are also noted in economic history, as in Inglis-Palgrave (1987, pp. 134-135). More recently, a persuasive case has been made for Berkeley's *The Querist* philosophy's central ideological position in the economic policies of Eamon de Valera and Fianna Fáil in the 1920s, despite the politically awkward consequences of such an influence: 'In their early years Fianna Fáil may have been reluctant to attribute influence to this Anglo-Irish Protestant clergyman because of a cultural context where a small, but vociferous, group among their supporters defined Irishness as exclusively Catholic and Gaelic. On the other hand, Irish Protestant intellectuals who desired an active role in the public life of the new state opposed this view. They sought to emphasise, even exaggerate, Berkeley's influence. For them, Fianna Fáil's use of Berkeley illustrated that Irish Protestants had contributed, and could continue to contribute, to the Irish nation. In time de Valera openly acknowledged a debt to Berkeley.' (Murphy, 2005, p. 63)

¹⁵¹ Berkeley and Swift are both complex figures to assess under the theme of imperial cruelty. Both men are certainly products of their time, and though they are at times *relatively* and markedly sympathetic to the dispossessed Catholic peasant class,

Query 530: Whether, nevertheless, we are not apt to think the money imported by our labourers to be so much clear gains to this country; but whether a little reflection and a little political arithmetic may not shew us our mistakes? (Berkeley & Sampson, 1898, p. 162)

*Query 199: Whether we are apprized, of all the uses that may be made of political arithmetic? (Berkeley & Sampson, 1898, p. 472)¹⁵²

Much of what Berkeley is really calling for from Britain in *The Querist* is some systematic attention to the terrible state of economic affairs in Ireland at the time, and to a lot of really poor behaviour from the wealthy Anglo-Irish settlers. His suggestions are never obviously about mathematising Irish policy or treating the Irish as mere components of a formal system—indeed, often his observations are all too personal. However, a merely cursory reading of *The Querist* gives the clear impression that he would have objected to the many of the nastiest parts of Petty's thinking, given how often he describes the contemporary treatment of the Irish as inhumane.

The *Querist* gives us interesting insight into Berkeley's social, political and economic interests in the period of *The Analyst*. Its style is also noteworthy and, according to George Sampson, reflects a new appreciation of the power of questioning prose learned in *The Analyst*.

The last few pages of the "Analyst" show us what a formidable weapon of controversy Berkeley had found in ironical and pungent queries: here in the present work he exhibits fresh skill in the use of this weapon. (...) [A] careful study of its contents will make it evident that for arousing general interest in somewhat dull matters Berkeley's terse and often humorous queries are singularly successful where pamphlets and treatises would fail. (Berkeley & Sampson, 1898, p. 112)

Rhetorically speaking, *The Querist* represents to Walmsley 'the most striking of [Berkeley's literary] formal experiments' (Walmsley, 1990, p. 141). Walmsley suspects the query form copies Newton's in the *Opticks* (though, as I claim in Chapter 4, it is better traced to earlier recommendations of the Royal Society), but says that Berkeley is doing something novel by constructing a whole work in this

believing the condition of the Irish people to be shameful, they also betray considerable feelings of disgust and lack of empathy.

¹⁵² The asterisk denotes a query that appeared in the 1735 edition, but not in the 1750 revision.

format.¹⁵³ *The Querist* allows Berkeley to provide a non-systematic, and yet repetitive and insistent, criticism of the conditions in Ireland and what he takes to be their causes. Though the statements are all delivered in question form, there is little difficulty in extracting the view of the author. Comparison to other tracts on similar issues (particularly Berkeley's *Word to the Wise*, first published in 1749 and republished with *The Querist* in 1750 and 1752) confirms that these were regarded by his public as constituting Berkeley's views on Irish social and political issues.

The Querist provides opportunity for some reflection on some of Berkeley's more lamentable views, and as a descendant of the very people he is discussing, and inheritor of the damage Berkeley and his colonialist peers wrought on the island of Ireland, I must confess I find it difficult to remain clinically detached in reading some of Berkeley's views on the native Irish.¹⁵⁴ As has been discussed already, Berkeley's believed that heresy—and here we must note the broadness with which he typically uses this term—be punished with the same fervour as treason. Berkeley is often hailed (especially by his editors Luce, Jessop, Fraser) for his enormous compassion in his dealings with the Irish relative to the regular approach of Anglo-Irish authorities of the time.¹⁵⁵ However, as I hope the above passages from Petty demonstrate, the bar for relative decency is extremely low in this period.

In Berkeley we find a less mathematical negotiation of the application of mercantile arithmetic to human subjects. Eric Schliesser has discussed the nature of Berkeley's racism in the *Querist* and *WTW*, drawing attention to the following

¹⁵³ For discussion see Walmsley (1990, pp. 141-142).

¹⁵⁴ I am grateful for reviewer feedback that has made me reconsider the content of *The Querist*. The great (and I would claim somewhat blinding) admiration for Berkeley characteristic of most of his biographers, editors, and the scholarship at large meant that it was only upon reading the primary material of *The Querist* thoroughly that I realised much of what is said about his enormous compassion for the Irish is often rather generously rendered.

¹⁵⁵ Some examples of his compassion picked out for praise include his willingness to keep company with the Irish and 'trying to inspire development from below' (Rashid, 1990, p. 38), his willingness to communicate with Catholic clergy, and his general upset at instances of starvation. Also, 'Berkeley considered that it was not inconsistent with his pastoral duties to labour for the material welfare of all those (the vast majority of whom were Roman Catholics) among whom his lot was cast.' (Johnston, 1970, pp. 4-5)

passages in which Berkeley reflects on the racial history and composition of the Irish:

Query 512: Whether our natural Irish are not partly Spaniards¹⁵⁶ and partly Tartars;¹⁵⁷ and whether they do not bear signatures of their descent from both these nations, which is also confirmed by all their histories?

Query 513: Whether the Tartar progeny is not numerous in this land? And whether there is an idler occupation under the sun than to attend flocks and herds of cattle?

Query 514: Whether the wisdom of the state should not wrestle with this hereditary disposition of our Tartars, and with a high hand introduce agriculture?

The origination of important elements of racist ideology in the modern period has become a topic of scholarly and popular interest. Recently, Jamelle Bouie has confronted it in his piece ‘The Enlightenment’s Dark Side’ for *Slate*, in which he argues that the Enlightenment was the source of ‘modern race thinking’ and outlines the need to confront it (amid the current enthusiasm for a return to ‘Enlightenment values’).¹⁵⁸

But even as they venerate the Enlightenment, these writers actually *underestimate* its influence on the modern world. At its heart, the movement contained a paradox: Ideas of human freedom and individual rights took root in nations that held other human beings in bondage and were then in the process of exterminating native populations. Colonial domination and expropriation marched hand in hand with the spread of “liberty,” and liberalism arose alongside our modern notions of race and racism. (Bouie, 2018)

The Querist is no exception here. It is simultaneously greatly aspirational and deeply regressive. In addition to the more racial and ethnic diagnosis given in Queries 512, 513 and 514, Berkeley is concerned with the lived qualities and dispositions of the native Irish:

¹⁵⁶ Elsewhere in *The Querist* Berkeley refers to Spaniards as ‘rich and lazy’. (Q517)

¹⁵⁷ ‘Tartar’ is replaced with ‘Scythian’ in the later work *WTW*: ‘The Scythians were noted for wandering, and the Spaniards for sloth and pride; our Irish are behind neither of these nations from which they descend, in their respective characteristics.’ (Berkeley & Sampson, 1898, p. 389)

¹⁵⁸ See especially Pinker (2018). Bouie also mentions Jordan Peterson’s general diatribes against postmodernism, and Jonah Goldberg’s ‘Suicide of the West’ as sources of this renewed enthusiasm for Enlightenment-type values.

Query 19: Whether the bulk of our Irish natives are not kept from thriving, by that cynical content in dirt and beggary which they possess to a degree beyond any other people in Christendom?

Query 348: Whether the natural phlegm of this island needs any additional stupefier?

Query 357: Whether our old native Irish are not the most indolent and supine people in Christendom?¹⁵⁹

Query 359: Whether it be not a sad circumstance to live among lazy beggars? And whether, on the other hand, it would not be delightful to live in a country swarming, like China, with busy people?

And he has suggestions for how these lived issues might be addressed, which include temporary slavery, the replacement of hospitals and schools for native children with in-house apprenticeships, and enforced infant labour:

Query 381: Whether other nations have not found great benefit from the use of slaves in repairing high roads, making rivers navigable, draining bogs, erecting public buildings, bridges, and manufactures?

Query 382: Whether temporary servitude would not be the best cure for idleness and beggary?

Query 384: Whether all sturdy beggars should not be seized and made slaves to the public for a certain term of years?

Query 386: Whether a state of servitude, wherein he should be well worked, fed, and clothed, would not be a preferment to such a fellow?

Query 305: Whether a Sum, which would go but a little way towards erecting hospitals for maintaining and educating the children of the native Irish, might not go far in binding them out apprentices to Protestant masters, for husbandry, useful trades, and the service of families?

Query 371: Whether children especially should not be inured to labour betimes?

Query 373: Whether it be true that in the Dutch workhouses things are so managed that a child of four years old may earn its own livelihood?

Schliesser sees the position laid out in *The Querist* as combining a racist characterisation of populations in terms of ‘inherited dispositions and identity’

¹⁵⁹ This thought is very much reinforced in *WTW*, in which Berkeley describes the Irish to the Catholic clergy as follows: ‘It is indeed a difficult task to reclaim such fellows from their slothful and brutal manner of life, to which they seem wedded with an attachment that no temporal motives can conquer (...). [I]f I may advise, you should, (...) endeavour to make yourselves useful to the public; and this will be best performed, by rousing your poor countrymen from their beloved sloth.’ (Berkeley & Sampson, 1898, pp. 397-398)

(Schliesser E. , Berkeley's Racialized Economic Development and Eugenics, 2015) with a rejection of the kind of racial determinism that thinks these characteristics could never be modified with intervention on behalf of those in power. And his comparison of the job of 'improving' the native populace with that of selective horse breeding in *The Querist* (Queries 215* & 216*) is evidence of both a rejection of racial determinism and an appetite for a kind of proto-eugenical programme in Ireland. Uzgalis (2005) argues that Berkeley is better understood as an ethnocentrist than a racist. His interests in changing the sorry conditions of Irish people are problematic and unsympathetic in many ways, but they are sincere, and there can be little doubt that he wanted a better outcome for the Irish, even if his suggested means of achieving it were sinister and somewhat disturbing.

Berkeley and Swift were both seen to be casual victims of an imperialist policy so interested in ensuring its own primacy that it ignored the thought that what was good for the economy of the colony was good for the coloniser. Naturally, this policy fell hardest on the poor, native population, but it disadvantaged the Anglican elite living there too, which explained why so many Anglo-Irish people preferred existences outside the country, as absentees:

But for those fated by earlier incriminating political choices to spend their days in Ireland—especially Church officials like Swift and Berkeley who were suspected of Jacobite sympathies—['depopulation' and 'absentee'] were bitter words. Let us remember that Dean Swift's "Modest Proposal" for solving England's protein problem with roasted Irish children and his mocking of Petty's "cost-benefit" analysis arose out a concrete problem: the mass migration caused by the famine years of 1726-1729. (Caffentzis, 2000, p. 134)

Another of Swift's satirical pieces, 'An Argument to Prove that the Abolishing of Christianity in England May, as Things Now Stand, Be Attended with Some Inconveniencies, and Perhaps Not Produce Those Many Good Effects Proposed Thereby' (1712) shoes a theologically similar spirit to Berkeley, and tackles many of the same people and caricatures that Berkeley does in the *Guardian* essays:

It is further objected against the gospel system, that it obliges men to the belief of things too difficult for freethinkers, and such who have shaken off the prejudices that usually cling to a confined education. (Swift, 1996, p. 44)

Let us argue this matter calmly: I appeal to the breast of any polite freethinker whether, in the pursuit of gratifying a predominant passion, he has not always felt a wonderful incitement, by reflecting it was a thing forbidden (...) (Swift, 1996, p. 47)

And to urge another argument of a parallel nature: if Christianity were once abolished, how could the freethinkers, the strong reasoners, and the men of profound learning, be able to find another subject, so calculated in all points, whereon to display their abilities? (Swift, 1996, p. 49)

Nothing can be more notorious than that the atheists, deists, socinians, anti-trinitarians, and other subdivisions of freethinkers, are persons of little zeal for the present ecclesiastical establishment (...) (Swift, 1996, p. 50)

Swift's writing on the freethinkers obviously influenced Berkeley, as did Berkeley's friendship with many of the key figures in a pamphlet culture so animated by the social perils that freethinking was believed to represent.¹⁶⁰ This literary influence was still lively in Berkeley's writing during the period he was, arguably, most incensed at the progress of freethinking ideology. We should read *The Analyst* with knowledge of the set of issues that motivated its writing, and with an awareness of the multitude of ways in which Berkeley expressed his frustration with these issues, including confuting and publically lampooning them.

¹⁶⁰ I discuss a particularly relevant *Guardian* article by Steele in Chapter 5, section 3.

Chapter 3: Berkeley's Mathematical Context: his Early Philosophy and the Euclidean Mathematical Landscape

3.1

Introduction

Berkeley's opinions on the general enterprise of mathematics are conspicuous among his peers in the 18th Century, and warrant some scrutiny if the relationship between the content of *The Analyst* and the rest of his philosophical writings is to be well understood. In his earliest philosophy, Berkeley expressed strikingly anti-mathematical sentiments. Importantly, this hostility was directed at both mathematicians and mathematics itself. Berkeley's disdain for mathematicians was often conveyed in terms of their vaunted reputations as reasoners in intellectual society—this sentiment remains pronounced throughout his philosophical career, and is even present in *Siris* in the form of satisfaction at having caused mathematics some reputational trouble with the publication of *The Analyst*.¹⁶¹ Niccolò Guicciardini suggests as much in his discussion of the aftermath of *The Analyst* and the fact that certain defences of fluxions led to further internal disputes about various points of the underlying philosophy. Explaining that two of Berkeley's

¹⁶¹[T]he mathematicians of this age embrace obscure notions and uncertain opinions, and are muddled about them, contradicting each other and disputing like other men: witness their doctrine of fluxions, about which, within these ten years, I have seen published about twenty tracts and dissertations, whose authors, being utterly at variance, and inconsistent with each other, instruct bystanders what to think of their pretensions to evidence' (*Siris*, p271). This footnote occurs amid criticism of the mathematical arguments of the 'geometrical philosophers' in favour of absolute space, which, Berkeley advises, we should not overestimate. By mentioning the mathematical arguments in the preceding decade he seeks to draw attention to the fact that mathematicians are just as rancorous and argumentative over obscure parts of their work as any other group. Thus, they do not deserve the additional weight that their status as mathematicians confers on their views; the series of tracts debating the ownership and rigour of the calculus serves as evidence to this effect.

Newtonian respondents, John Jurin and Benjamin Robins, gave conflicting explanations of Newton's theory of limits, Guicciardini remarks: 'Berkeley was probably amused to see that two fluxionists were unable to agree on such an important subject.' (Guicciardini, *The Development of Newtonian Calculus in Britain 1700-1800*, 1989, p. 45) Thus, there is an intellectual prestige element to his anti-mathematicism which is important in addition to his attitudes towards mathematics and its applications.

Early on, Berkeley's philosophical discomfort with much theoretical mathematics was a natural by-product of his radical empiricism. In this chapter, I give an account of Berkeley's responses to the mathematics of his university education. I outline his hostile reception of the Euclidean orthodoxy that defined the mathematics of his generation. I discuss some of the distinctive views he expressed in the early work and assess the received scholarship regarding a change of position in the mathematical philosophy of the *Principles* (in light of what I take to be a large amount of consistency between at least some of the anti-mathematical ideas of the notebooks and those of the later works). I review a number of central Euclidean tenets and explain their tension with Berkeley's most foundational metaphysical views. Finally, I examine Berkeley's thinking on infinite divisibility and assess the relationship between mathematical proofs and metaphysical interpretations, taking John Keill's infinite divisibility proof as a case study.

3.2

Earliest Mathematical Rhetoric

In his article on the place of mathematics and logic in the philosophy of the eighteenth century, James Franklin writes:

[P]hilosophers have one thing in common in their attitude toward mathematics, in this last century before the surprise of non-Euclidean geometry undermined the pretensions of mathematics to infallibility.

It is envy. What is envied in particular, is the mathematical method, which apparently produced what philosophy wished it could but had been unable to: certain truths, agreed to by all, delivered by pure thought. (Franklin, 2006, p. 817)

Though this aptly captures the enthusiastic spirit of the relationship between some eighteenth century philosophy and mathematics, it would be a misleading summary of Berkeley's position. Increasingly, the variety of anti-mathematical views held by central early-modern thinkers is assuming a more important place in the scholarship, and there is much left to be written about Berkeley in this regard. There is one sense in which Berkeley might be described as envious of mathematics and its prestige, but as to Franklin's suggestion is that it's an envy arising out of some genuine feeling that mathematics had achieved greater certainty and success than philosophy—this is far from Berkeley's assessment. Berkeley believed that the prestige that pure mathematics had secured for itself was ultimately undeserved, and that the results of the developments in a large portion of such mathematics were trivial when seen in their proper context. According to Geoffrey Warnock, Berkeley judged that the results of the work of his contemporary mathematicians were, in terms of value, 'of no more importance than a jig-saw puzzle.' (Warnock, 1953, p. 216)

Berkeley's earliest known musings on the esteem of mathematics are in the notebooks and they convey a fiercely independent (and fairly indignant) attitude towards the mathematics and mathematicians of the era:

finiteness of our mind, no excuse for the Geometers (N292)

What shall I say? Dare I pronounce the admir'd ἀκρίβεια¹⁶² Mathematica, that Darling of the Age a trifle? (N313)

Ridiculous in the Mathematicians to despise sense. (N317)

What need of the Utmost accuracy when the Mathematicians own in rerum natura they cannot find any thing corresponding with their nice ideas. (N330)

I'll not admire the Mathematicians, tis what any one of common sense might attain to by repeated acts. I know it by experience, I am but one of common sense, and I etc (N368)

¹⁶² The LSJ (Liddell-Scott-Jones Lexicon) provides 'precision' and 'exactness' as translations.

Nullum Praeclarum ingenium unquam fuit Magnus Mathematicus.
Scaliger. (N370)¹⁶³

The folly of the Mathematicians in not judging of sensations by their senses. Reason was given us for nobler uses. (N373)

Mathematicians have some of them good parts, the more is the pity. Had they not been Mathematicians they had been good for nothing, they were such fools they knew not how to employ their pains. (M375)

I'll teach any one the whole course of Mathematicques in 1/100 part the time that another will. (N385)

These are sciences purely Verbal, & entirely useless but for Practise in Societys of Men. No speculative knowledge, no comparison of Ideas in them. (N768)

It is clear that at the time of formalising and planning the presentation of his immaterialism Berkeley's views towards mathematics and mathematicians were markedly disparaging and patronising. The author of the notebooks thought he could teach all there was to say about mathematics in one hundredth the time it took a mathematician, thought the scholarship that afforded it such esteem a 'trifle', believed that mathematical aptitude was a mere product of repetition, and cites Scaliger in his assessment that no great genius was ever a mathematician.

In the notebooks, Berkeley was frustrated by the following situation: with very few exceptions, mathematics enjoyed universal intellectual esteem and was believed to represent a special achievement of human rationality and a paradigm of certainty. However, the question of what relationship geometry stood in to the empirical world remained unclear. Even though the landscape of mathematics changed dramatically in the nineteenth century, we see the same unusual situation that frustrated Berkeley articulated by a noted figure from the last century:

One reason why mathematics enjoys special esteem, above all other sciences, is that its laws are absolutely certain and indisputable, while those of all other sciences are to some extent debatable and in constant danger of being overthrown by newly discoverable facts. In spite of this, the investigator in another department of science would not need to envy the mathematician if the laws of mathematics referred to objects of our mere imagination, and not to objects of reality. For it cannot occasion surprise that different persons should arrive at the same logical conclusions when they have already agreed

¹⁶³ 'No great genius was ever a strong mathematician' (my translation). Luce's note for this entry ends with '*Scaligerana* (Cologne, 1695). Joseph Scaliger (1540-1609) is attacking Christopher Clavius, a Jesuit geometrician. (Berkeley G. , p. 123)

upon the fundamental laws (axioms), as well as the methods by which other laws are to be deduced therefrom. (Einstein, 1921, p. 82)

A similar species of thought leaves Berkeley wondering whether the success of mathematics is mostly to be found in a special kind of immunity or safety it has. A version of that safety can be seen in the following remarks from the notebooks:

Herein Mathematicques have the advantage over Metaphysiques & Morality. Their Definitions being of words not yet known to y^e Learner are not Disputed, but words in Metaphysiques & Morality being mostly known to all the definitions of them may chance to be controverted. (p. N162)

Typically, Berkeley does not direct his critical views at the methodology of mathematics, or at least he is not keen to present himself as such. There is evidence along these lines in a number of the entries in the notebooks, but also in print in *Arithmetica* and *Miscellanea*, and later, in the opening of *The Analyst*.¹⁶⁴ His commentary suggests that deduction has its place, and that mathematics can be a good practice for the mind, insofar as he imagines it could be used to exercise the brain before directing it towards actual problems. This sentiment is quite clear from his fondness for Bacon's tennis analogy, discussed in my first chapter.¹⁶⁵

Concerning Franklin's claim that all philosophers of the eighteenth century envy the success of mathematics, however, it is exactly because the mathematical method is applied to a set of postulates or axioms that fail to describe anything real, in Berkeley's view, that render the results empty, even if they do 'certainly' follow 'truly' from those same axioms. In this respect, Warnock's jigsaw analogy is

¹⁶⁴ 'The Schoolmen have noble subjects but handle them ill. The mathematicians have trifling subjects but reason admirably about them, certainly their method and arguing are excellent.' (p. N409) '[That] their way of deduction from those principles [is] clear and incontestable, we do not deny' (*Principles*, §118). 'And It must be owned, that when the definitions are clear, nor the axioms denied; when from the distinct contemplation and comparison of figures, their properties are derived, by a perpetual well-connected chain of consequences, the objects being still kept in view, and the attention ever fixed upon them; there is acquired an habit of reasoning close and exact and methodical (...)' (*The Analyst*, §2). Though I take the final quotation to be Berkeley playing the role of orthodox mathematician, it is still worth noting that he takes the rectitude of the methodology to be a starting point.

¹⁶⁵ The Bacon analogy compared pure mathematics to tennis—it's valueless in its own right, but insofar as it quickens the reactions and improves the muscles, it finds extrinsic value in the other activities to which these skills may be brought.

brilliantly illustrative. It is possible to be really brilliant at puzzles, brilliant in a way that a niche community of puzzle fanatics should indeed revere, however, for Berkeley, the broader intellectual community (far from niche) is prepossessed by what should be a niche activity. He stands outside bewildered and indignant at this fascination. If the subject in question is, as Berkeley believes, just a misguided abstraction from a potentially meritorious subject, then the activity might as well be understood in the context of a fanciful talent. Descartes made a similar, seemingly uncharacteristic observation, as noted in Nelson (2017):

I was not surprised to find that even many clever and learned men, after dipping into these arts, either quickly lay them aside as childish and pointless or else take them to be so very difficult and complicated that they are put off at the outset from learning them. For there is really nothing more futile than so busying ourselves with bare numbers and imaginary figures that we seem to rest content in the knowledge (cognition) of such trifles. (AT X 376; CSM 1 18)¹⁶⁶

This seems surprising coming from Descartes, but Nelson argues persuasively that scholars have oversimplified his position on mathematics, and overlooked evidence of his early suspicion of the usefulness of significant portions of mathematics. Nelson's analysis makes Descartes look like a forerunner to the Berkeleyan position in a way that previous thinking failed to highlight, and shows a frequency of this kind of anxiety about attitudes to mathematics among philosophers with much less empiricist sympathies than Berkeley. Though Berkeley is unlikely to have appreciated this element of Descartes' thinking, it is interesting to note the same scepticism in a thinker so much better placed to resist it.

The last few years have seen increasing attention paid to early modern anti-mathematicism, with publications on the subject from Nelson (as above), Eric Schliesser and Charles T. Wolfe, as well as a special edition of *Synthese* on the uses and abuses of mathematics in early modern philosophy. This research provides a serious counter narrative to that given above in Franklin. It gives us a new lens through which to view disparate seeming attitudes to the mathematisation of

¹⁶⁶ I have followed Nelson's citation convention for Descartes. Works cited are from Adam and Tannery (1982-91), as translated in Cottingham (1984-85) They are abbreviated by AT followed by the roman numeral of the Adam and Tannery volume, the page number, then followed by a semi-colon and the Cottingham (et al) volume number and page number.

traditionally philosophical questions. Nelson (2017) discussed Descartes' opinions on the 'extremely limited' usefulness of mathematics. Wolfe's piece (2017) looks at what he describes as the '*resolutely anti-mathematical*' approach of important factions of Enlightenment life sciences. Schliesser has written a lot here, and I should confine myself to what is most relevant to the case at hand.

Like Nelson, Schliesser sets his position against the *prima facie* view of the canonical rationalists as mathematical devotionists, arguing that we shouldn't infer a privileged epistemic status for geometry in Spinoza from his selection of a geometric style of presentation in the *Ethics*. Though Spinoza was an interested consumer of mathematics, and saw merit in the geometrical method of presentation, Schliesser argues, it is a mistake to see him as someone who thought mathematical physics was the key to understanding the natural world or that the mathematisation of disciplines was, in general, a good thing. He sees the nexus of these attitudes in a passage from a letter to fellow radical Lodewijk Meyer, known as the "Letter on the Infinite". In it, Spinoza suggests that something like a category mistake is being made by those who would try to explain the fundamentals of substance and eternity in terms of measure, time and number. In Spinoza's thinking, time and number are modes of the imagination, rather than of the intellect, whereas substance and eternity are only amenable to analysis via the intellect. The following section is crucial:

You can see clearly from what I have said that measure, time, and number are nothing but modes of thinking, or rather, of imagining. So it is no wonder that all those who have striven to understand the course of nature by such notions—which in addition have been badly understood—have so marvelously entangled themselves that in the end they have not been able to untangle themselves without breaking through everything and admitting even the most absurd absurdities. For since there are many things which we cannot at all grasp by the imagination, but only by the intellect (such as substance, eternity, etc.), if someone strives to explain such things by notions of this kind, which are only aids of the imagination, he will accomplish nothing more than if he takes pains to go mad with his imagination. (Spinoza, 1985, p. Letter 12 §57 p.203)

Schliesser regards Spinoza as the main source of anti-mathematicism in the seventeenth and eighteenth centuries.¹⁶⁷ With respect to Berkeley, I think this potential connection is interesting, but that it will be very difficult to make with any confidence if the connection is to mean anything like explicit influence. First, Berkeley's anti-mathematicism is present, perhaps in its most vociferous version, in the very earliest work we have from him. It is also much more radical and sustained than Spinoza's. If Berkeley caught it from Spinoza, or one of the Spinoza surrogates Schliesser mentions, it would have to have been in his absolute philosophical nascence. Further, he would have been amplifying it considerably, since Berkeley is not simply against mathematisation (in the sense of the 'containment strategy' discussed by Schliesser), but variously against mathematisation, mathematics and mathematicians.

Further, Berkeley is generally negatively disposed towards Spinoza as a thinker. In his later work on vision, Spinoza is accused of offering a 'little disguised' atheism (*TVV* §6) and he is the source of more than one snippy exchange in *Alciphron*.¹⁶⁸ Stephen H Daniel (2012) draws interesting connections between the two thinkers, particularly in relation to Berkeley's *Siris* views and Berkeley's own development of the idea that 'God alone exists' (*Siris* §344). Daniel does an excellent job of showing how their opinions on the substance of God and the substance of nature bring these ostensible foes quite close together in places. Given the major difference between the two men—commitment to theological orthodoxy—it is easy to see how, despite this ostensible allegiance around

¹⁶⁷ Support for this can be found in his writings on Adam Smith's anti-mathematicism (Schliesser E. , 2017), Spinoza's anti-mathematicism (Schliesser E. , 2017), and in a blog post on Berkeley's anti-mathematicism (Schliesser E. , 2012).

¹⁶⁸ One reference even points to Spinoza's fondness for demonstration. Dion: 'I have heard, said I, *Spinosa* represented as a man of close argument and demonstration. He did, replied *Crito*, demonstrate: but it was after such a manner, as one may demonstrate any thing. Allow a man the privilege to make his own definitions of common words, and it will be no hard matter for him to infer conclusions which in one sense shall be true and in another false, at once seeming paradoxes and manifest truisms. For example, let but *Spinosa* define natural right to be natural power, and he will easily demonstrate that *whatever a man can do* he has a right to do. Nothing can be plainer than the folly of this proceeding: but our pretenders to the *lumen siccum* are so passionately prejudiced against religion, as to swallow the grossest nonsense and sophistry of weak and wicked writers for demonstration.' (*Alciphron* VII §29). See also Lycicles' appeals to him in *Alciphron* IV §16 and *Alciphron's* in *Alciphron* VI §31.

substance, Berkeley can never assent to a material, extended God. Indeed, this is always equated with freethinking and heresy for him, and he sees his own philosophy as a solution: 'My Doctrines rightly understood [,] all that Philosophy of Epicurus, Hobbs, Spinoza etc which has been a Declared Enemy of Religion Comes to the Ground.' (N824) Thus, this characterisation of similarity would have been one Berkeley resisted in the extreme, and Daniel never claims that Berkeley was positively influenced by Spinoza, and even speculates that Berkeley may have given up on the project of strictly articulating his theory of mind clearly in the proposed second book of the *Principles*, upon realising how close it came to Spinoza's.¹⁶⁹

It might be possible to think of Berkeley's reading of Toland and Mandeville, whose Spinozist inheritances are well argued by Schliesser and others, as facilitating a kind of influence by proxy. Indeed, Toland's anti-mathematical tendencies are interesting and undeniable, and in certain passages one might be forgiven for thinking it was Berkeley writing, and not his freethinking *bête noire*. In a commentary on Leibnizian metaphysics¹⁷⁰ written 'at the behest of Her Majesty the late Queen of Prussia', Toland opens a memorable section with a reminder about an exchange between himself and the Queen, in which he describes as 'very discerning' her insistence 'that of all those who take up philosophy, *mathematicians* satisfy [her] least'. (Toland, Francks, & Woolhouse, John Toland's 'Remarques Critiques sur le Systême de Monsr Leibnitx de l'Harmonie préetable', 2000, p. 108) In developing this idea he remarks on the problematic role of misunderstanding abstract entities as follows:

Thus certain terms, invented by *mathematicians* for very good reason in order to focus the imagination and help develop their calculi, have often been misunderstood by others, and sometimes indeed misapplied by certain *mathematicians*, who (instead of using them as architects use scaffolding, for the convenience of workmen) have put them forward as so many fundamental principles, on which they have then constructed theories. In this way it has been maintained that *lines*, *surfaces*, and *mathematical points* really exist in nature, and from that they have drawn many conclusions: amongst others, *that extension is composed of mathematical points*—which is to say that length, breadth, and depth, are made up of what is neither long, nor

¹⁶⁹ Daniel (2012, p. 134).

¹⁷⁰ Francks and Woolhouse judge the attribution of this work to Toland to be established, citing Brown (1999), Lamarra (Lamarra, 1998) and Woolhouse (1998).

broad, nor deep, or that size comes from what is not a quantity. (Toland, Francks, & Woolhouse, John Toland's 'Remarques Critiques sur le Systême de Monsr Leibnitx de l'Harmonie préetablie', 2000, p. 108)

In the same section, Toland laments the confusions arising from: the mathematical understanding of infinity; belief in the reality of numbers; the use of the predicate 'infinite' in descriptions of natural phenomena; and, the supposition that invented mathematical calculi can give 'an account of the nature of things' (Toland, Francks, & Woolhouse, John Toland's 'Remarques Critiques sur le Systême de Monsr Leibnitx de l'Harmonie préetablie', 2000, p. 108). Though, as I suppose is necessary to *some* extent in any anti-mathematical sentiment, his view is tempered along the following lines:

And it is no less an error for *philosophers* to think they can succeed in their investigations without in any way applying to natural phenomena the *mathematician's* calculi. Without them they will never be able to work out (for example) the size of the effect of one thing on another, or the consequences which follow from it. From all this I draw this conclusion: that a man can be an excellent *mathematician*, without being even a mediocre *philosopher*; but he can never be a profound *philosopher* without being a passable *mathematician*. (Toland, Francks, & Woolhouse, John Toland's 'Remarques Critiques sur le Systême de Monsr Leibnitx de l'Harmonie préetablie', 2000, p. 109)

Thus, Toland is an important part of the anti-mathematical story of the period, and the above remonstrations against letting the mathematical tail wag the philosophical dog are striking and symptomatic of an important thread of the anti-mathematical tendency. However, given the publication of the above Leibniz commentary in 1716, it's unlikely to be something that could have influenced Berkeley's anti-mathematical development significantly. In fact, Toland refers to Berkeley's immaterialism in this very work (as that of 'an Irish theologian and mathematician' (Toland, Francks, & Woolhouse, 2000, p. 109)), and particularly if it was the *Principles* he had read, it is plausible that he may have been inspired by the anti-mathematical components of that work.

There is no evidence that Berkeley read Mandeville very early on in his development, so if Toland or Mandeville play a role in Berkeley's anti-mathematicism, it would have to be influence in the form of bolstering rather than

instigating. Also, it does seem challenging to think of a line of influence running through Toland and Mandeville, given that Berkeley's opinion of them was so very low. I discuss Berkeley's unfair misreading of Mandeville later, but it's worth noting that Berkeley bundles Toland and Mandeville among the freethinkers who he tends (largely unjustifiably and clumsily) to see as fixated on formality and 'nice' ideas. As such, I think Berkeley is a more difficult figure to connect to this tradition of anti-mathematicism.

It is perhaps best to think of his as a core, philosophy-motivating intuition that coheres very naturally with many of the anti-abstractionist, radically empiricist points he wishes to emphasise in the early philosophy. Berkeley rarely mentions philosophical influences when railing against mathematics. Two clear, if fleeting, examples are the *Miscellanea* Bacon reference¹⁷¹ and the Scaliger reference in the notebooks (N370, quoted below). In terms of specific targets of his anti-mathematicism, Berkeley tends to focus on figures now better known for their contributions as practicing mathematicians; John Keill and Joseph Raphson are particularly important examples here.

Analysis of the notebooks requires a measured approach. Since Berkeley never intended for the contents to be published or studied, it is important not to draw overly extravagant conclusions from the contents, especially since he ordinarily took great care in the articulation of his published ideas. His willingness to publish further editions and editorial introductions are a testament to this. Publishing the *Dialogues* in the hopes that it might excite interest in immaterialism among less academic readers (and avoid some of the confusion that arose in the *Principles*—consider Dr Johnson's infamous stone-kicking) also confirms a view of him as a careful exponent of his views.

Thus, there is a need to balance the tentativeness that should accompany the knowledge that these are Berkeley's unedited thoughts with the desire to respect what are obviously strong early views as such. The sheer volume of commentary devoted to this subject—Douglas Jesseph estimates that almost a

¹⁷¹ Even if Berkeley's use of Bacon is selective, and not illustrative of the philosopher's general attitudes to mathematics, it is still interesting that he regarded Bacon as a peer with respect to this way of evaluating the usefulness of mathematics.

third of the comments address mathematical views (Jesseph D. , 1993, p. 45)—and the remarkable candour with which he addresses the subject should enable us to infer a strong set of views on the character and reputation of mathematics from the notebooks. That such a large volume of the commentary concentrates on mathematical material, often addressing abstractionist mathematics and related concerns, should also shed light on how we think about the relationships between the novel metaphysical views (the heterogeneity of immediate objects of sense perception, metaphysical immaterialism, phenomenalism) and his preoccupation with the problems arising out of the popular role of abstraction in philosophy, especially in Locke's work.

Other philosophers have approached the notebooks differently. Tom Stoneham describes his scholarly maxim in his book on the philosophy of the *Dialogues* as '*Attribute to Berkeley the weakest view consistent with the published work unless a stronger view would make it considerably more plausible.*' (Stoneham T. , 2002, p. xi) He associates this maxim with the project of 'a book for those whose interest in Berkeley is more philosophical than historical.' (Stoneham T. , 2002, p. xii) The discussion prefiguring this goes as follows:

Most scholars will be concerned by the way I have completely ignored a major part of the Berkeley corpus, namely the *Philosophical Commentaries*. These two notebooks (...) provide a fascinating insight into Berkeley's mind and his methods of study and writing. Luce aptly describes them as 'the winding paths of a great man's private thoughts on a lofty theme' (Editor's Introduction, p.5). The word 'private' in that description should already caution us about using these notes to interpret Berkeley's published works. Throughout this book I make the methodological assumption that we can distinguish the question 'What is the philosophical view expressed in the *Three Dialogues*?' from the question '*What is the philosophical view held by Berkeley?*'; The distinction is important because in publishing a book a philosopher is making a decision to put forward certain philosophical views as his own and inevitably to remain silent on various other topics. He expects his public not to know anything more about his thoughts than he tells them in the book, and to interpret and evaluate his views solely on the basis of what he has published. If, through historical research, we have more information than this, we have the option of ignoring it in favour of trying to reconstruct the philosophy Berkeley intended his readers to attribute to him. And that is exactly what I have chosen to do. (Stoneham T. , 2002, p. xi)

This approach makes a lot of sense for the project of explaining the philosophy of the *Dialogues*, since, not only is the book a re-presentation of *Principles* material with the goal of making the material more digestible, but it comes with a preface outlining that pedagogical aim: before he publishes the second part of the *Principles*, he wants to clarify the positions of book one, and lay them out ‘in the most easy and familiar manner.’ He also says the book assumes no knowledge of the former, so we can safely infer that Berkeley thought it explained his metaphysical principles in a self-contained way. Thus, in places where the notebooks come into tension with the *Dialogues*, and even when they don’t, they can be ignored, unless the project is more to understand the history of the evolution of the ideas, which, as Stoneham says, his is not. I take my philosophical question in this thesis to be as much the second as the first (as laid out in the above quote), and given my different philosophical focus, I take it that my use of the notebooks is in keeping with the spirit of the system laid out above.

Returning to those notebooks: it seems, at least in its earliest presentation, that Berkeley’s rejection of abstraction was informed in a large way by mathematical views and a relationship he saw between certain mathematical tenets—particularly infinite divisibility—and his ambitions for a new metaphysics. Berkeley believed, with good reason, given articulations in Barrow and Keill, that there was a move to be made from the Euclidean proofs of infinitely divisible mathematical extension, to a view of infinitely divisible actual extension that would have precluded his idealism, since it postulates a property of extension that is not available in perception. This connection is made clear in Berkeley’s early and revealing reference to Keill in conjunction with the perceptual ‘mite’:

Keills filling the world with a mite this follows from the Divisibility of extension ad infinitum. (p. N364)

3.3

Prescriptive Remarks: What Geometry Should Treat

The best known and most comprehensive account of Berkeley's views on mathematics is Jesseph's in *Berkeley's Philosophy of Mathematics*.¹⁷² He presents the young Berkeley as unabashedly revisionist in his views about geometry. When Berkeley cites the great follies of the mathematicians in his earliest writings, he often merely alludes to their endorsement of one or another of the cornerstone suppositions of Euclidean geometry, which, given the esteem of classical mathematics at the time, should strike us as indicative of a considerable revolutionary spirit. Jesseph presents Berkeley as mellowing ideologically as he moves into the later philosophy. For Jesseph, Berkeley's most significant conversion in mathematical thinking takes place in the period between the notebooks and the *Principles*. He pays particular attention to Berkeley's apparent endorsement, in the *Principles*, of geometric arguments explicitly or implicitly rejected in the notebooks and sees the removal of the final anti-mathematical section of the *NIV* (in a 1732 re-publication) as a later verification of a significant ideological transformation. Jesseph acknowledges a markedly instrumentalist spirit in *Alciphron* and sees plenty of evidence in *The Analyst* for the view that Berkeley has whole-heartedly embraced classical mathematics.¹⁷³ On the point of post-notebooks transformation, Jesseph's account infers a lot from §131 of the *Principles*:

Have we not therefore reason to conclude they are *both* in the wrong, and that there is in effect no such thing as parts infinitely small, or an infinite number of parts contained in any finite quantity? But you will say that if this doctrine obtains it will follow the very foundations of Geometry are destroyed, and those great men who have raised that science to so astonishing a height, have been all the while

¹⁷² Jesseph (1993). Jesseph's interpretation is outlined in full in Jesseph (1993) and summarised in Jesseph (2005).

¹⁷³ In *Alciphron*, Euphranor implies that we should regard infinitesimals as an example of a case in which it would be unwise to overlook practical value in search of the Lockean idea-representational version of meaningfulness, saying: 'Be the science or subject what it will, whensoever men quit particulars for generalities, things concrete for abstractions, when they forsake practical views, and the useful purposes of knowledge for barren speculation, considering means and instruments as ultimate end, and labouring to attain precise ideas which they suppose indiscriminately attached to all terms, they will be sure to embarrass themselves with difficulties and disputes. Such are those who have sprung up in geometry about the nature of (...) infinitesimals and divers other points; notwithstanding all which, that science is very rightly esteemed an excellent and useful one (...)' (*Alciphron*, D7 §15).

building a castle in the air. To this it may be replied that whatever is useful in geometry, and promotes the benefit of human life, does still remain firm and unshaken on our principles; that science considered as practical will rather receive advantage than any prejudice from what has been said. But to set this in a due light may be the subject of a distinct inquiry. For the rest, though it should follow that some of the more intricate parts of Speculative Mathematics may be pared off without any prejudice to truth, yet I do not see what damage will be thence derived to mankind. On the contrary, I think it were highly to be wished that men of great abilities and obstinate application would draw their thoughts from those amusements, and employ them in the study of such things as lie nearer the concerns of life, or have a more direct influence on the manners. (*Principles*, §131) I take this section to be insufficient to justify the claims Jesseph makes that suggest a significant ‘shift from zealous revisionism to a brand of instrumentalism’ (Jesseph D. , *Berkeley's Philosophy of Mathematics*, 1993, p. 75). I regard this section as deeply ambiguous with respect to its position on geometry. While Berkeley denies that geometry should be seen as ‘building a Castle in the Air’ (in contrast with his accusation that speculative mathematics is just ‘all day making hard knots on purpose to unty them again’ (p. N868)), he does qualify this by saying that nothing ‘in Geometry (that) promotes the benefit of humane Life’ will vanish under his system, nothing from ‘that Science considered as Practical.’ (§131) What is clear is that some of traditional geometry will remain intact under his system, and some will not. What will remain will remain on the basis of its usefulness and benefit to human endeavour. To suggest that this implies a great departure from his outlook as previously stated seems problematically under-motivated. The outlook prior to the *Principles* always had an instrumentalist emphasis and that in the *Principles* is still strongly revisionist.

I disagree with Jesseph’s interpretation of a number of important aspects of Berkeley’s thought, and significant portions of this thesis are devoted to explaining these disagreements, and detailing why I think a more contextually sensitive account is necessary. Our approaches are different: my reading of Berkeley—particularly, later Berkeley—is deeply influenced by thinking about his theological worries and societal neuroses in that period. Perhaps because it is a work of apologetics, Jesseph is less interested in *Alciphron*, and in the debates that follow

Berkeley's publication of the *Analyst*. In particular, on my account of *The Analyst*, Berkeley avoids denigrating mathematics in the Body of that text and uses a fairly typical understanding of geometry as the standard against which to assess calculus not because he has come to admire classical mathematics but because that is the background against which he wants to show the internal illegitimacy of the mathematics, in the face of its own disciplinary assumptions. It's one thing to say the early calculus foundations wouldn't satisfy phenomenalists' desires, but it's quite a different point to argue that this development contradicts the standard operating rules of the discipline itself, which is the central point Berkeley wanted to make in that effort.

Jesseph's account, which advocates for a 'Representative Generalisation' theory of Berkeleyan mathematics, suggests that the *Principles* represents a new phase in Berkeley's mathematical thought, at least insofar as Berkeley is no longer talking in terms of the necessity of overhauling all of traditional geometry and replacing it with something more empirically grounded. After the notebooks, Berkeley doesn't express the same critical attitudes towards the central Euclidean tenets (e.g., linear bisectability), and his praise of the successful application of various mathematical methods that rely on Euclidean principles could encourage belief in the view that in the later years there is at least some weak acceptance of the traditional account of Euclidean geometry.

Parts of this picture are correct, and Jesseph is right to note a change between the tone of the private notebooks and the later work. It is clear that the Berkeley of the notebooks initially thought that overhauling traditional geometry would have been a consequence of a successful reception of his metaphysical recommendations, particularly those about perceptual minima.¹⁷⁴ And, that there is no evidence of subsequent work on that project should make us wonder about Berkeley's subsequent thinking on the relationship between immaterialism and classical mathematics. Had he come to think that classical mathematics was in fact consistent with his metaphysics? Or, recognising the necessary reformulation of

¹⁷⁴ This is as much as explicit in a number of remarks in the notebooks, where he either acknowledges that he will have to re-explain some mathematical issue under his new schema, or suggest that he has the solution to an existing problem or similar (e.g., N29, N207, N253, N469 and N511).

geometry for the enormous theoretical obstacle it was, had he found a way of explaining how one could accept his new system without having to overhaul traditional mathematical thinking? Had he found a more palatable way to present the relationship between his philosophy and classical mathematics?

I am confident in the latter option for a number of reasons. The content and tone of his discussions of mathematics in the Queries section of *The Analyst*, and in the writings following its publication (*DFM* and *RNR*) still show great disdain for classical mathematics and its purveyors and cheerleaders, as well as invocations in line with the 'containment strategy' Schliesser discusses in his work.¹⁷⁵

An analogy may clarify my thinking here. While advocating for one position, saying that it has beneficial consequences for another position doesn't necessarily amount to an endorsement of that second position. My thinking in this case is that Berkeley, in laying out his new immaterialist program (which he obviously does endorse), understands that showing that it is consistent with, or even complimentary to, other established scholarly projects that people value is ultimately to the benefit of the new immaterialist program. As philosophers, we may hope that more people become interested in philosophy for the sake of the benefit of its study to its students, and for the continuation and improvement of the discipline. This often involves talking about the advantages of doing philosophy, and it may make sense to try to discourage one false narrative (that those who study philosophy at undergraduate level have a hard time getting employed afterwards, or, are setting themselves up to earn less eventually). It might be of use to point out that students who graduate from philosophy programs actually outperform many disciplines with better reputations for graduate employability.¹⁷⁶ I don't think an important benefit of doing philosophy is that it may make the hiring department of a bank think more highly of you, but I think convincing uninitiated people to take philosophy seriously may require explaining that it has knock-on virtues that may actually seem quite opposed to the reputation of the study.

¹⁷⁵ I discuss this evidence in greater detail in the next chapter.

¹⁷⁶<https://www.theatlantic.com/notes/2015/09/philosophy-majors-out-earn-other-humanities/403555/>

If the central *esse est percipi* claim, along with the abstraction objections, is taken seriously, there is no suitable way to arrive at infinite divisibility, abstract idealizations of extension, or incommensurable relationships between parts of mathematical abstractions. I disagree that it is obvious that a significant change of opinions takes place by the time of the *Principles*, but there is perhaps sufficient evidence for the more conservative claim that by the time of the work in the early 1730s the emphasis of his philosophical work had changed considerably, or at least his viewpoint has become sufficiently pragmatic that we no longer find emphasis on issues like the proper objects of mathematics, and though it he is still republishing the works on immaterialism and idealism, it should be noted that this element of his philosophical outlook is much less central in the new writings. To support the thesis that Berkeley changed his views in the 1730s, it seems significant that his most substantial engagement with mathematics in that period (*The Analyst*, and continuing in *DFM* and *RNR*) has so little to say about his own views on the proper objects of analytic geometry.

The Analyst is, as Berkeley says, an *argumentum ad hominem*.¹⁷⁷ If it were not, it would be surprising to see Berkeley's philosophical views relegated as afterthoughts to the Queries section, especially since the discussion of infinitesimals offers an excellent opportunity to discuss the counterintuitive consequences of materialism and endorsing infinite divisibility. It is noteworthy that he reaffirms his earlier views on the visual geometry and nature of visual minima in his republication of *NVT* in 1732. This edition was appended to and bound together with *Alciphron* just a year and a half before *The Analyst*; so, we know that there was no explicit change in his opinion on the geometry of immediate perception. I take that restatement of his position to serve as evidence that though his metaphysics and philosophy of perception had remained largely unchanged (he still thought of visual extension as composed of minima, that the immediate objects of vision are two-dimensional and that talk of length or extension less than the minimum sensible is meaningless), the extent to which he allows them to shape his discussion of mathematical and scientific matters has changed.

¹⁷⁷ I discuss this claim in more detail in the fourth and final chapters.

Jesseph argues that the change of position is evident in the *Principles*, yet Berkeley's remarks about sensible minima and infinitesimals make it look as though he is still critical of mathematicians talking about infinitesimals as though they must ground mathematical results, when sensible minima, the true fundamentals of experience, will suffice.

If it be said that several theorems undoubtedly true, are discovered by methods in which infinitesimals are made use of, which could never have been, if their existence included a contradiction in it, I answer, that upon a thorough examination it will not be found, that in any instance it is necessary to make use of or conceive infinitesimal parts of finite lines, or even quantities less than the minimum sensible: nay, it will be evident this is never done, it being impossible. (*Principles*, §132)¹⁷⁸

The tone is certainly very different from that of the notebooks, but the strong conclusions remain. The common notion of an infinitesimal (here considered as a part into which an infinite division divides a line), or any part lesser than the line's smallest perceived part, contains a contradiction. It is impossible to conceive of or make use of the parts of geometry that require positing properties that contradict experience. It contradicts *esse est percipi* in postulating a meaningful structure beneath the level of perception. Given Berkeley's broader views (already expressed in the *Principles* in the preceding sections), geometry must answer to perception—either geometry is *about* extension in the abstract (which he believes an impossible abstraction) or it is about actual extension, and as such must be explicable accordingly. Berkeley's philosophy could not admit a notion of a line segment where, although extension must be perceived extension, and the smallest parts of that extension are the minimally perceived parts, there will always be, for all perceived minima, a host of unperceivable parts contained in each smallest part. He discusses the repugnancy of the sensible minima in the *NTV* (§§80-82) and there is no retraction of this element in *TVV*.¹⁷⁹

¹⁷⁸ In the next chapter I argue that Berkeley's firm belief in this message changed by the time of the *Analyst*. Or, more accurately, his belief that this was still an agenda worth actively pursuing had changed.

¹⁷⁹ *TVV* is much shorter than *NTV* and is less focused on the minutia of the perceptual theory, but more so on the relating of the philosophy of vision to the theological metaphysics of *Alciphron*. According to Luce: 'In one respect the tract goes beyond the

It will perhaps be objected that the minimum visibile of a man doth really, and in it self contain parts whereby it surpasses that of a mite, though they are not perceivable by the man. To which I answer, the minimum visibile having (in like manner as all other the proper and immediate objects of sight) been shewn not to have any existence without the mind of him who sees it, it follows there cannot be any part of it that is not actually perceived, and therefore visible. Now for any object to contain several distinct visible parts, and at the same time to be a Minimum Visibile, is a manifest Contradiction. (*NTV*, §81)

Given that these are natural consequences of his metaphysical and perceptual views, it seems strange to say that his position has changed, since, even if this is consistent with his having discovered a new instrumentalist way of talking about the philosophical matters raised (as I think Jesseph suggests), in absence of an articulation of such views, it seems more natural to suppose that many of his stronger, earlier views remained fairly intact; especially since the fuller instrumentalism of *De Motu* is not articulated until 1721.

For these reasons I think we should tread carefully in attributing a changed view on geometry in the *Principles*, as Jesseph and Szabo do.¹⁸⁰ Brook suggests that no such substantial change occurs, but he concedes a change in emphasis.¹⁸¹ Brook's version does not emphasise a change between the earlier publications (*NTV*, *Principles*, *Dialogues*) and the later work (*Alciphron*, *The Analyst*) which I hope to make. To assess Berkeley's attitude towards the contemporary mathematics, it is necessary to assess his remarks in the other early texts for consistency with those in the notebooks. In *NTV* and the *Principles* Berkeley makes clear what he thinks geometry is about, or at least should be about. In the notebooks, when he remarks that the mathematicians 'think there are insensible lines, about these they harangue, these cut in a point, at all angles these are divisible ad infinitum' (p. N393), that they 'despise sense' (p. N317), and that they 'cannot find any thing

original essay, and is more than a vindication, and more even than an explanation in the ordinary sense of that term.(...) The tract has a doctrinal significance, which, I think, has not been noticed by other editors. It is like a political 'explanation' or theological 'restatement' which travels outside the original incident or document, and brings in something relevant, but new.' (*TVV*, Luce's Introduction) Less than half of *TVV* deals with the detail of the old theory (the other half being concerned with its application and relevance for theological issues), and its treatment of microscopy and the minimal components of vision is limited.

¹⁸⁰ See Jesseph (1993) and Szabó (1995).

¹⁸¹ Brook (2012).

corresponding with their nice ideas' (p. N330), we should infer that Berkeley believes that mathematicians should think in terms of sensible lines, in such a way that precludes terminations in zero-dimensional points and infinite divisibility, they ought not overlook sense, and should abandon the 'nice' ideas of abstract mathematics and talk in a way that conforms to experience. The traditional version of a line through Euclidean space is a straight object with no width and no depth. The constitution and axioms of Euclidean space make possible such representations of straight objects. When Berkeley refers to the geometers' contention that 'they suppose that we have an idea of length without breadth or that length without breadth does exist' (p. N342), this is exactly the thought he is criticising. In the notebooks, Berkeley thinks geometers are misunderstanding their object, and as a result, are as good as talking about nothing.

In the *Principles*, many of Berkeley's objections to the formation of general abstract ideas are explained in terms of triangles. He suggests that framing an idea of an abstract triangle is simply not something we do or are capable of doing and declares that the traditional view that proofs and statements about triangles are really about some insensible and ultimately abstract triangle is a historical inheritance that has been to the detriment of philosophy.¹⁸² The account he offers in opposition entails that propositions about triangles, in proofs and elsewhere, refer to actual, particular triangles, and that the appearance of 'triangle' in those propositions can suggest to the mind any member of the class of particular triangles as outlined by a working definition. A version of this partial consideration selective concentration theory is available in the notebooks too: 'Considering length without breadth is considering any length be the breadth what it will.' (p. N722)

In the mathematical sections of the *Principles* he begins 'From Numbers we proceed to speak of Extension, which considered as relative, is the Object of

¹⁸² 'If any man has the faculty of framing in his mind such an idea of a triangle as is here described, it is in vain to pretend to dispute him out of it, nor would I go about it. All I desire is, that the reader would fully and certainly inform himself whether he has such an idea or no (...) What more easy than for anyone to look a little into his own thoughts, and there to try whether he has, or can attain to have, an Idea that shall correspond with the description that is here given of the general idea of a triangle, which is, neither oblique, nor rectangle, equilateral, equicrural, nor scalenon, but all and none of these at once?' (*Principles Introduction*, §13)

Geometry' (*Principles*, §123). The 'is' here is prescriptive, since he has already bemoaned the prevalent view that geometry deals only with abstract extension and the 'relative' may mean relative to a perceiver, relative to the aforementioned numbers, or relative to other extensions.¹⁸³ As such, particular extension is the rightful object of geometry. '(E)very particular Finite Extension, which may possibly be the Object of our Thought, is an Idea existing only in the Mind, and consequently each Part thereof must be perceived.' (CXXIV) Each part must be perceived for reasons relating to the transparency of ideas, which is a necessary component of his metaphysics. Geometry should deal with extended things, so, things that occupy space, where extension must be understood as consisting in ideas of perceivers. That 'each part thereof' must be perceived is aimed at those who see geometric extension as infinitely divisible, which, given the necessity of conformity with perception, must be wrong, and which confirms that he thinks geometry should be about actual, particular extension.¹⁸⁴ Given the rejection of infinite divisibility, how should we think about the minimal elements of extension? In terms that are in concurrence with our perceptions of them, he says, in the minimally sensible parts, or, the *minima sensibilia*.

A similar discussion takes place in the *Dialogues*. After Philonous has tried to make the case that talking about a physical object as though it exists in itself, or without being perceived, is just as incoherent as saying that a pain or smell might exist without being felt or smelled, Hylas asks whether the frequent appeals of

¹⁸³ Berkeley uses the word 'relative' in a variety of ways in the *Principles*. The first mention, at §11 says: 'Again, *great* and *small*, *swift* and *slow*, are allowed to exist no where without the mind, being intirely relative, and changing as the frame or position of the organ of sense varies.' This is what I take him to have in mind in the above quote. However, he uses the term variously elsewhere. §110: [T]ime, space and motion, are delegated into *absolute* and *relative*, *true* and *apparent*, *mathematical* and *vulgar*: which distinction, as it is at large explained by the author, doth suppose those quantities to have an existence without the mind.' In this case, it makes sense to think he is referring to the Scholium to the Definitions of Newton's *Principia*, and that this allusion strongly implies he was adopting Newton's usage, of meaning relative to other times, space and motions.

¹⁸⁴ This is where Berkeley thinks scepticism may creep in on the materialist picture. If there's more to matter than what we perceive in it, how do we know it's anything like the way we perceive it to be, or that our experiences are at all a reliable indicator of what things are really like.

mathematicians to abstract extension don't show this conjecture to be false at least in one case:

Hylas: Isn't it easy to consider extendedness and motion by themselves, abstracted from all other sensible qualities? Isn't that how the mathematicians handle them?

Philonous: I acknowledge, Hylas, it is not difficult to form general propositions and reasonings about extendedness and motion, without mentioning any other qualities, and in that sense to treat them abstractedly. I can pronounce the word 'motion' by itself, but how does it follow from this that I can form in my mind the idea of motion without an idea of body? Theorems about extension and shapes can be proved without any mention of large or small or any other sensible quality, but how does it follow from this that the mind can form and grasp an abstract idea of extension, without any particular size or shape or other sensible quality? Mathematicians study quantity, disregarding any other sensible qualities that go with it on the grounds that they are irrelevant to the proofs. But when they lay aside the words and contemplate the bare ideas, I think you'll find that they aren't the pure abstracted ideas of extendedness. (*Dialogues* 193)

The phrase beginning 'I can pronounce the word 'motion'...' is intended to convey that he agrees that mathematicians say that they are doing one thing—successfully talking about abstract extension—but, he intends, the matter of whether it is a plausible thing they are claiming or not is another. Berkeley affirms in the notebooks in the early work that he believes mathematicians talk as though they have a satisfactory account of the referents of their terms and propositions, and in most cases reason well from their premises to their conclusions, but he believes that the better part of their axiomatic premises are false and that the terms they use are referentially empty. This is consistent with the remarks in the notebooks that suggest that any talk of geometry that takes its subject to be abstract extension is meaningless.

3.4

Philosophically Opposed: Berkeley's Philosophy and Euclidean Foundations

Some articulation of the technical and mathematical tensions between Berkeley's philosophy and the Euclidean system is necessary. Berkeley's earliest publications and presentations were devoted to mathematics (*Arithmetica*, *Miscellanea*, and 'Of Infinites'),¹⁸⁵ and in a way that demonstrates an interest in mathematical practice as much as in purely philosophical presentations of mathematical material.¹⁸⁶ Scholars of Berkeley's views on mathematics¹⁸⁷ primarily consider Berkeley's mathematical background exclusively in terms of a reaction to preceding philosophy (e.g., Aristotelian abstraction in the philosophy of the Schoolmen, Locke's treatment of numerical ideas, or, in the case of Levy (1992), the perceptual tenets of *NTV*).¹⁸⁸ I have no desire to downplay the importance of Berkeley's views on abstraction,¹⁸⁹ whatever their philosophical inheritance, to his mathematical opinions. However, I would like to explore the relevant background in mathematical practice, since such views do a lot of work in the notebooks and *Principles*, and I think it is possible to draw out just how influential they were to his metaphysics.

¹⁸⁵ 'Of Infinites' (1707/1708) and its contents are fairly well known and have been discussed in Chapter 1. In that text, Berkeley sticks closer to Locke than he usually does, explicitly stating that words only have meaning when they represent a clear idea. He openly questions the legitimacy of the actual infinite, which forges a connection between his earliest works and a tradition of raising doubts about this concept continued by Kronecker, Hilbert, Brouwer, Poincaré and Wittgenstein. The same worries over the actual infinite, with related concerns over Locke's handling of it, are expressed in the notebooks: 'Infinite number why absurd, not rightly solv'd by Locke.' (N123) He also references the debate between Nieuwentijt and Leibniz about whether higher order infinitesimals have a real value or not. Worries about the actual infinite can be traced back at least as far as Aristotle's *Physics* III. 4-8. For discussion of this history, see Moore (1990).

¹⁸⁶ That this is so is supported by the frequency of references to figures who are primarily mathematicians in the notebooks.

¹⁸⁷ For example, Jesseph, Szabo, Warnock and Levy.

¹⁸⁸ A noteworthy exception is Helena Pycior (1987). In 'Mathematics and Philosophy: Wallis, Hobbes, Barrow, and Berkeley', significant attention is paid to Berkeley's thinking about the mathematicians of the period just preceding his, and her avowed focus is 'analyzing Berkeley's mathematical views against the background of the English mathematical world of the seventeenth and early eighteenth centuries'.

¹⁸⁹ It is worth noting that Berkeley reaffirms his objections to abstraction in the 1730s. For example, in 1730, he writes to Johnson 'Abstract general ideas was a notion that Mr. Locke held in common with the Schoolmen, and I think all other philosophers; it runs through his whole book *Of Human Understanding*. He holds an abstract idea of existence exclusive of perceiving and being perceived. I cannot find I have any such idea, and this is my reason against it.' (Hight, 2012, p. 319) He also uses arguments against them in the semantic arguments of the seventh dialogue of *Alciphron*.

The Schoolmen have noble subjects but handle them ill. The Mathematicians have trifling subjects but reason admirably about them (...) (N409)

Berkeley mentioned Euclid and a number of other mathematical thinkers in the early work. John Keill, Isaac Barrow, John Wallis, Isaac Newton, Gottfried Leibniz, Bonaventura Cavalieri, Charles Hayes, Joseph Raphson, Bernard Nieuwentyt, Edmund Halley and George Cheyne are all referenced, and in such a way that suggests that mathematical work was at the forefront of his thinking in that formative phase of his independent views.

Berkeley naturally saw a connection between the positive program of presenting his metaphysical treatise and the task of addressing some popular mathematical opinions that ran contrary to his views and had been suggested to have consequences for metaphysics. He says as much explicitly with respect to John Keill in the notebooks (N322),¹⁹⁰ and he frequently acknowledges a need to weigh in on mathematical disputes (N333, N384 and N834). With these dispositions in mind, I hope to shed some light on his mathematical philosophy by assessing them in light of the mathematical practice of his time and its inheritance from classical mathematics. In eighteenth century academia, the space between philosophy of mathematics and mathematical practice was much narrower,¹⁹¹ but I think a fuller picture of his mathematical influences should pay heed to the enormous influence practicing mathematicians had on his early philosophy.

As I have outlined, Berkeley was derisive in his attitude towards the esteem of mathematicians, but further clarification is needed on what particular content he found so troubling. There have been two especially eminent accounts of the foundations of classical geometry in the history of mathematics. The chronologically later, Hilbert's *Foundations of Geometry/Grundlagen* (1899), was published approximately a century and a half after Berkeley's death, so the mathematicians of Berkeley's time still all took their cue from the ancient Euclidean version. Though subsequent mathematicians built on the system greatly, the first

¹⁹⁰ 'Mem: to prove against Keil that the infinite divisibility of matter makes the half have an equal number of parts with the whole.' (N322)

¹⁹¹ This is a point made in Mancosu (1996) with respect to the seventeenth century, but it is equally true of the eighteenth century. This view also emerges in Sepkoski (2005).

substantial derailment to the system's monopoly on geometric thinking came after Berkeley's death. In the 1830s and 1840s, the invention—or discovery, depending on one's ontological sympathies—of equally logically consistent non-Euclidean geometries encouraged new thinking in which Euclidean geometry was one of, or just a special case of, a number of possible geometries. I will summarise the relevant points of the Euclidean geometry that held such a command over Berkeley's peers with a view to demonstrating the tensions with some of Berkeley's own most deeply held philosophical tenets. I use the example of John Keill to highlight the divisibility issues that arise out of a Euclidean system that is roughly contemporaneous to Berkeley.

While Hilbert's modern casting of geometry offers great insight into the motivations and relationships between various parts of the structure of the geometric system (never relying on shared intuitive understandings of basic concepts, the text is helpfully scattered with informal elaborations and helpful re-articulations), Euclid's offers us no such context; reliance on basic intuitions is necessary and foundational. The *Elements*¹⁹² begins by asserting preliminaries. These are divided into three groups,¹⁹³ labelled 'definitions' (*horoi*), 'postulates'

¹⁹² There are roughly a thousand editions of Euclid's *Elements*, so the question of which version Berkeley worked from is a complicated one. Post-1850 versions are based on the Heiburg document (discovered 1808 in the Vatican library, so unless Berkeley was figuratively and literally ahead of his time that's out of the question). Pre-Heiburg, editions were based on one copy that had been through multiple translations (into Latin through Boethius, preserved in Arabic by Harun al Rashid (while it was lost to Europe), then through Adelard of Bath back into Latin in around 1120). There was an edition published by Henry Billingsley in 1570, based on the Adelard copy that had a popular 'Mathematical Premise' by John Dee. At the time of Berkeley's TCD tenure the library had four versions: 'Moxon's relatively trivial one; Simon Grynaeus (Basel, 1533); Rhodius (Wittenberg, 1634) and (...) Meibomius' musical treatise of 1652.' (Sue Hemmens, Marsh's Library, in correspondence) Marsh's Library, where Berkeley may have read, had the versions by Isaac Barrow, William Oughtred and Henry Savile, among others. The Berkeley family's catalogue (auction list available here: <http://picus.sns.it/documenti/Berkeley%20George.pdf>) lists Commandino's 1572 edition, the 1533 Herwagen version (with Proclus commentary), Isaac Barrow's 1714 edition, and Robert Simpson's 1756 edition (see entries 212, 737, 974 and 1036). The auction list is not conclusive, and it's excessive (it includes Berkeley's, his son's and his grandson's books), but it gives us interesting insights into books that passed through the ownership of the different generations of the Berkeley family.

¹⁹³ This roughly mirrors a philosophical distinction based on that in the *Posterior Analytics*: 'Every demonstrative science concerns three things: (a) the things it

(*aitaemata*), and ‘common notions’ (*koinai ennoiai*). Immediately following are proofs of 48 propositions therefrom, which divide into two kinds: those outlining the performance of geometric tasks (*problēmata*) (1-3, 9-12, 22, 23, 31, 42, 44-46) and those which make assertions (*theoremata*) (the remaining ones).¹⁹⁴ In subsequent versions of Euclid’s *Elements* there have very often been introductions from leading mathematicians or mathematics educators of the time, in which some of the motivations and considerations are discussed, but no such elaboration is afforded within the Body of the text, which typically remains largely unchanged in later editions.¹⁹⁵ Sometimes attempts are made to shorten proofs or examine isolated issues in more detail, and there are publications which only include some rather than all of the books (*e.g.*, editions omitting the arithmetical material). Although much scholarship was devoted to the proof of the fifth postulate from the previous four, there was very little questioning of the truth of any of the axioms and theorems expounded (at least in Book I). These were the putatively indubitable foundations on which Berkeley believed the mathematicians of his time were founding all of their work. The extent of contemporary confidence in Euclid is evident from the following excerpt from John Keill, whom Berkeley regarded as one of the main exponents of bad extrapolations of metaphysical conclusions from geometric arguments:

There might be innumerable other Demonstrations produced, to shew the infinite Divisibility of Quantity, and entirely to overthrow the Hypothesis of Indivisibles. But what occasion is there for more? since the Arguments hitherto alleged, have not less force to compel the Assent, than any Demonstration in Euclid’s Elements; insomuch that it is impossible to weaken them, as to destroy the Fundamentals of geometry, which no Age or Sect of Philosophers has been ever able to effect. (Keill, 1720, p. 30)

hypothesizes to be (these constitute the genus of which it studies the *per se* properties (*pathematon*)); (b) the so-called common axioms from which first things it proves; (c) and third the properties (*pathe*) of which it assumes what each signifies.’ (Apo. 1.10, 76b11-16)

¹⁹⁴ I have followed Ian Mueller’s demarcation of the Euclidean preliminaries in Mueller (2009).

¹⁹⁵ One exception is Oliver Byrne’s 1847 beautiful ‘coloured’ edition, in which we see pictorial rather than simply formal proofs.

Euclid's definitions begin with the most fundamental units of geometry: points and lines. The first three are sufficient to set the scene for the Berkeleyan discourse:

1. A point is that which has no parts.
2. A line is a breadthless length.
3. The extremities of lines are points.

The definition of a point as 'that which has no parts' is central to traditional mathematics and its partlessness is supposed to sustain the second definition of a line as length without breadth.¹⁹⁶ Because there is no extension in the relevant other dimensions, we should think of the line as having no depth whatsoever. The line has points as its extremities, so, we may define a line by its outer positions on the plane. The movement from one end to the other, in the trajectory of a point, is what we might suppose to generate the line.¹⁹⁷ This is alluded to in two of the following postulates:

Let the following (capacities) be supposed:

1. To draw a straight line from any point to any point.
2. To produce a finite straight line continuously in a straight line.

¹⁹⁶ For Berkeley, this definition can only apply to *minima sensibilia*. Those are the entities which have no perceptually scrutable parts—the minimal entities given in perception. 'That which has no parts' used to describe an unextended abstraction would represent a non-entity for Berkeley.

¹⁹⁷ This is handled differently in the more structuralist, modern geometry. Mueller: '(In Euclid) one must rely on general mathematical intelligence. This difference (...) is reflected in the difference between Euclid's first three postulates and their analogues in the *Grundlagen*. Consider Euclid's first postulate (...). Hilbert asserts the existence of a straight line segment connecting two points when the points are given. This difference is essential. For Hilbert's geometry axioms characterize an existent system of points, straight lines etc. (...) existence is inferred from the axioms. In general Euclid produces or imagines producing the objects he needs for a proof (...) [I]n the geometry of the *Elements* there is no underlying system of points, straight lines, etc. which Euclid attempts to characterize. Rather, geometric objects are treated as isolated entities about which one reasons by bringing other entities into existence and into relation with the original objects and one another. (...) In the geometry of the *Elements* the existence of one object is always inferred from the existence of another by means of a construction.' (Mueller, *Philosophy of Mathematics and Deductive Structure in Euclid's Elements*, 1981, pp. 14-15) An interesting research avenue—one explored briefly in Brook (2012)—might be to see how Hilbert's system might better serve Berkeleyan interests, given its explicitly formalist foundations.

Geometers have the capacity to produce straight lines, drawing from a first point to a second point, and the capacity to extend lines by drawing further lines from the endpoint of existing lines to other points along the same trajectory. Euclid offers no definition of the geometric plane, so it appears that, as with the 'common notions', we are to assume that the idea of a plane is one of which we all have an intuitive grasp (perhaps, one that we can arrive at if we can grasp a point intuitively, and then a line etc....).

We might think of a plane as describable as a set of points, as we do with the Cartesian plane. As primitives of the system, from them we can generate geometric objects, by beginning at a point and terminating at some other point, per the above postulates. Related to the idea of geometric generation is the issue of geometric composition, which is one emphasised by Keill in his discussion of divisibility. Given that the line is defined by generation at one point and termination in another, there is temptation to think of the line as in some sense composed of points, such that the line contains the original and terminating points, and all the points that lie in between the two extremities.¹⁹⁸ But, how does one achieve extension from the unextended?

The failure to strictly define the relationship between the point (considered as the extremity of a line), and the point (considered as part of the line) is frustrating from a Berkeleyan standpoint, and it is clear that Berkeley thinks mathematicians are insufficiently troubled by the composition of extension from non-extended entities.¹⁹⁹ John Dee discusses this distinction in his introduction to the 1570 *Elements*:

A Line is neither thicke nor broade, but onely long: Every certayne Line, hath two endes: The endes of a line, are Pointes called. (...) If a Poynt

¹⁹⁸ Interestingly, one challenge to the view that Robinsonian nonstandard analysis rescues Leibnizian infinitesimal calculus (pretty much without changing the spirit of the original theory) is that Robinson and Leibniz had different views of the line in way just described. Robinson sees the continuum as being made up of points, but it seems Leibniz saw it as non-punctiform in terms of its constitution, but rather points mark locations on the continuum. See Robinson (1967), and Katz and Sherry (2013) for discussion.

¹⁹⁹ 'Mem: nicely to discuss what is meant when we say a line consists of a certain number of inches or points etc A Circle of a certain number of square inches, points etc. (N445)

move from a determined situation, the way wherein it moved, is also a Line: mathematically produced, whereupon, of the auncient Mathematiciens, a Line is called the race or course of a Point. A Poynt we define, by the name of a thing Mathematicall: though it be no Magnitude, and indivisible: because it is the propre ende, and bound of a Line: which is a true Magnitude. (Dee, 1570, p. §4)

There are two—related but separable—disagreements that Berkeley’s system finds with the Euclidean norm. Both are manifest from his earliest works: the understanding of a line as length without breadth²⁰⁰ (this disagreement is an offshoot of idealism and has similar consequences for the line’s zero-dimensional and two-dimensional analogues, the point and the plane), and, the view that a finite line is infinitely divisible.²⁰¹ In the remaining material of this chapter I will discuss how Berkeley’s foundational metaphysical views combine in such a way that cannot allow for the promotion of his own philosophy against a backdrop of breadthless length or an infinitely divisible finite extension.

3.5

Infinite Divisibility and Berkeley’s Early Philosophy

Berkeley’s broader metaphysical and perceptual views make little space for infinite divisibility. If the claim is that particular extensions are infinitely divisible, then that contradicts human experience and perception of finite extensions. In *NTV* Berkeley dismisses this option in §54. The introduction to §54 (in the synoptic table of contents) reads: ‘*Two kinds of sensible Extension, neither of which is infinitely Divisible.*’ The two kinds he intends are visible extension and tangible extension, both of which are in some sense available in vision, though the latter is not the proper object of that faculty, but given mediately by associations given in experience. He concludes §54, saying: ‘[W]hatever may be said of Extension in

²⁰⁰ Hence the remark: The mathematicians think there are insensible lines, about these they harangue, these cut in a point, at all angles these are divisible ad infinitum. We Irish men can conceive no such lines (N393).

²⁰¹ ‘Most certainly no finite extension divisible ad infinitum.’ (N314)

Abstract, it is certain sensible Extension is not infinitely Divisible. There is a *Minimum Tangibile*, and a *Minimum Visibile*, beyond which Sense cannot perceive. This, every one's Experience will inform him' (NTV, §54). This naturally brings us to abstract extension; if the infinite divisibility claim is about abstract extension, then Berkeley objects to the possibility of conceiving of extension in the abstract, let alone assigning it properties with any meaningful kind of interpretation. Turning to abstract extension, he says:

I find it proper to take into my Thoughts Extension in the *Abstract*: For of this there is much talk, and I am apt to think, that when Men speak of *Extension* as being an *Idea* common to Two Senses, it is with a secret Supposition, that we can single out *Extension* from all other Tangible and Visible Qualities, and frame thereof an Abstract *Idea*, (...) We are therefore to understand by *Extension in Abstract*, an *Idea* of Extension, v.g. a Line or Surface, intirely stript of all other sensible Qualities and Circumstances that might determine it to any particular Existence. It is neither Black, nor White, nor Red, nor hath it any Colour at all, or any Tangible Quality whatsoever. And consequently it is of no finite, determinate Magnitude. Now I do not find that I can perceive, imagine, or any wise frame in my Mind such an abstract Idea, as is here spoken of. A Line, or Surface which is neither Black, nor White, nor Blue, nor Yellow, &c. Nor Long, nor Short, nor Rough, nor Smooth, nor Square, nor Round, &c. is perfectly incomprehensible. This I am sure of as to my self; how far the Faculties of other Men may reach, they best can tell. (NTV, §122-123)

A philosopher committed to *esse est percipi* as a metaphysical axiom cannot allow the following situation: although finite extension is perceived to be finite with a limit on the extent to which we can examine its parts, *in actual fact*, that extension is divisible into an infinite number of parts. If 'to be is to be perceived', then perception defines existence, and to talk as though finite extensions comprise multitudes or infinities of parts in each instance of what my perceptions take to be minimal, is plainly confused. As a general principle, there is nothing in an idea that is not perceived in it. Specifically, for finite extensions:

If (therefore) I cannot perceive innumerable parts in any finite extension that I consider, it is certain they are not contained in it: but it is evident, that I cannot distinguish innumerable parts in any particular line, surface, or solid, which I either perceive by sense, or figure to myself in my mind: wherefore I conclude they are not contained in it. (*Principles*, §124)

One natural worry is how such a view can handle the experience of using microscopes or any other vision-altering instrument, or indeed account for the experiences of perceivers with different capacities and orientations. Berkeley raises the issue of perceptual relativity in the *Dialogues* in the discussion of primary and secondary qualities. Philonous says: 'A mite therefore must be supposed to see his own foot, and things equal or even less than it, as bodies of some considerable dimension; though at the same time they appear to you scarce discernible, or at best as so many visible points' (*Dialogues*, 188). The distinction between *immediate* and *mediate* perception is important here:²⁰²

There are two kinds of perception of objects involving the use of our senses- immediate perception and mediate perception. Mediate perception is compound, consisting of (a) the immediate perception of one or more ideas of sense, and, in addition, (b) the imagination's suggesting (or perhaps the intellect's inferring) certain other ideas of sense that are connected with the ideas of sense that are immediately perceived. Immediate perception does not have this (b) component and involves the use of just our senses alone. Our perception of objects such as chairs and coaches is always mediate, never immediate. (Pitcher, 1986, p. 100)

Mediate perception involves the perceptions of objects or properties *via* immediate perception, while the objects of immediate perception are, in the visual case, colours and lights, in the aural case, mere sounds, etc. In vision, I immediately perceive only arrangements of colours when I mediately perceive objects that I *understand* cross-modally (*e.g.*, a snooker ball, rather than just a round clump of red minima).

The minimum visible, which is the smallest part of immediate visual perception, is the same in all visual perceivers: '[And] *first*, I shall observe that the *minimum visible* is exactly equal in all beings whatsoever that are endowed with the visive faculty' (*NTV*, §80). To Berkeley, the issue is one of definition, and neither consideration of a superior visual system, nor orientation based on perceivers of differing sizes should count against the original definition. '[S]uppose it otherwise, and that the *minimum visibile* of a mite, for instance, be less than the *minimum visibile* of a man: the latter therefore may by detraction of some part be made equal

²⁰² This distinction is invoked in the *NTV* in §2, §9, §11, §18 and developed in some detail in §51-54.

to the former: it doth therefore consist of parts, which is inconsistent with the notion of a *minimum visibile*' (NTV §80). Given that Berkeley's minimum visible has no existence outside the mind, it does not make sense to say that such a minimum could contain parts that a mite could see; there simply is no scaling up and down in proportion to the material size.

Returning to the mite: that *Dialogues* remark concerns the relativity of mediate perception. I see a snooker ball at the other end of the table as constituted by x number of minima, and when I move around the table and lean down to take a shot with the ball directly in front of me, it now occupies $10x$ minima. Nothing has happened to the properties of the minima, except that they now inform me about the tangible properties of the ball in a different way, since my orientation has changed. This notion of 'greater prospect', as Berkeley refers to it, is always with respect to the 'secondary and mediate objects of vision'.²⁰³

The cases concerning mites and microscopes turn on the same distinction; the perceiver looking through the microscope has the same number of minima of the same size available to her, they are just a different set of minima.

In neither of those two ways, do Microscopes contribute to the Improvement of Sight; for when we look through a Microscope, we neither see more visible Points, nor are the collateral Points more distinct than when we look with the naked Eye, at Objects placed in a due Distance. A Microscope brings us as it were into a new World: It presents us with a new Scene of visible Objects, quite different from what we behold with the naked Eye. (NTV §85)

For these reasons, it makes little sense on the Berkeleyan model to speak of parts of an idea not perceived in the idea, since there is nothing in a sense-impression other than what is perceived to be in it. That we can never be mistaken about our

²⁰³ It is difficult to go into much more detail here without moving wholesale into the complexities of the larger issue of the Berkeleyan divine visual language theory, but the idea is succinctly conveyed in the following excerpt: '[T]he proper objects of vision constitute an universal language of the Author of Nature, whereby we are instructed how to regulate our actions in order to attain those things that are necessary to the preservation and well-being of our bodies, as also to avoid whatever may be destructive of them (...) And the manner wherein they signify and mark unto us the objects which are at a distance is the same with that of languages of human appointment, which do not suggest the things signified by any likeness or identity of nature, but only by an habitual connexion between them' (NTV, §147).

perceptions is the reason that Berkeley believed his metaphysics could defeat scepticism: the object 'in itself' that is alleged to exist out in the world beyond our ideas, to which we have no direct access, is taken out of the system, our epistemic doubts vanish. This very point is made with respect to extension in the *Principles*. Berkeley begins by stating that the notion of infinite divisibility is the source of a great amount of confusion in geometry:

Every particular finite extension, which may possibly be the object of our thought, is an *idea* existing only in the mind, and consequently each part thereof must be perceived. (...) the extensions I have in view are no other than my own ideas, and it is no less plain, that I cannot resolve any one of my ideas into an infinite number of other ideas, that is, that they are not infinitely divisible. (*Principles*, §124)

To see how these views connect with his mathematical context, it's necessary to look to the discussion of divisibility in his time and how he engages with that debate, since it's the locus of the relevant metaphysical worries.

There were a number of proofs of infinite divisibility available to Berkeley's contemporaries and Berkeley had a number of ways of engaging with them. Sometimes, he regarded them in terms of the necessity of perceptual minima given the nature of perception (*e.g.* *NTV* and *Principles*), sometimes by pointing to seeming absurdities that arise out of the assumption of infinite divisibility (*i.e.* the notebooks). A number of the authors of the proofs are mentioned by him explicitly (John Keill and Isaac Barrow among others). Additionally, we know from the notebooks (N424) that Berkeley was familiar with Bayle's discussion of the trilemma, which, though not itself a proof, is a classic exposition of the difficulties facing the three main candidate views on the components of extension: thus, it purports to disprove infinite divisibility, but presents the equally damning issues with the alternatives.²⁰⁴

Typically, such proofs fall into one of two categories. There are proofs which, in the style of a *reductio ad absurdum*, begin with the assumption that finite extension is only finitely divisible, produce a logical contradiction via valid steps,

²⁰⁴ The alternatives to infinitely divisible extension are extension as composed of mathematical points and extension composed of finite atoms. The trilemma occurs in Bayle's article on Zeno of Elea in his *Dictionnaire Historique et Critique* (Bayle, Historical and Critical Dictionary, 1965).

and thus conclude we must believe the negation of the assumption. One such example concerns the commensurability of the internal diagonal of a square and its side.²⁰⁵ If we assume that the relevant lines are only finitely divisible into *equal* parts (that they are equal is not a necessary assumption, but it is a frequent one, and Berkeley is committed to it), there must be a finite d which represents the number of parts in the diagonal, and another finite s which represents the number of parts in the side. Then, the relationship between the two units is d/s should be rationally expressible as a quotient. The assumption of a rational relationship between a square's diagonal and its side means that the conjunction of two fundamental proofs of classical mathematics must be false. Pythagoras' Theorem tells us that the relationship between the diagonal and side of a square is $\sqrt{2}:1$, and, the *Elements* contains a proof against the possibility of expressing $\sqrt{2}$ as a rational fraction.²⁰⁶ Thus, the assumption that extension is merely finitely divisible leads to an apparent absurdity: the Pythagorean Theorem and the proof of the irrationality of $\sqrt{2}$ are false. Arguments of this style are discussed in the *Port-Royal Logic* and in Keill (1720).

Proofs of the second kind against a finite limitation on divisibility involve geometric constructions. In these proofs, the property of a line that allows it always to be extended, per Euclid's second postulate, is exploited for the purpose of proving that the finite line must be always susceptible of further downward analysis. Examples of such proofs are in Isaac Barrow, Keill, and again in the *Port-Royal Logic*. They point to a classical feature of the line (in-principle infinite extendibility) and declare a relationship such that this feature entails infinite divisibility.²⁰⁷ I will discuss Berkeley's views in the context of John Keill's articulation of the issue. The selection of Keill is motivated by Berkeley's explicit mentioning of Keill in the context of the proofs of infinite divisibility in the notebooks: 'Mem: to prove against Keil that the infinite divisibility of matter makes the half have an equal number of parts with the whole' (N322). I think Keill's argumentative moves from

²⁰⁵ The Berkeley of the notebooks believed that an approach that freed mathematics of incommensurable surds would be a boon rather than an absurdity (even though he recognised that it accompanied a loss of generality in ratios between figures and parts of figures). He has a section on the treatment of Surds in his *Arithmetica*.

²⁰⁶ In Euclid (The Thirteen Books of Euclid's Elements, p. Bk 10: 117)

²⁰⁷ Typical examples involve concentric circles and intersecting lines.

coordinate geometry to the world at large are a really good example of the kind of mathematical thinking that motivated Berkeley's anti-mathematicism. Further, his complete devotion and proselytizing in favour of Newton and Newtonianism (so complete that Newton eventually sought distance from him)²⁰⁸ is an example of the kind of mathematics-obsessed ardour that Berkeley so loathed. This proof is a particularly apposite example given that Keill's defence of his view deals specifically with a philosophical objection to infinite divisibility (that of Jean-Baptiste du Hamel) and, it addresses an element that many of the other proofs leave implicit: the distinction between parts and points. Lastly, it makes the very move that represents a threat to a Berkeleyan metaphysics—it supposes that proofs of infinite divisibility of abstract/geometric extension can be exported to demonstrate the infinite divisibility of particular/metaphysical (Keill: 'physical') extension.

3.6

Keill's Proof of the Infinite Divisibility of Extension

Keill's lecture on the infinite divisibility of magnitude, delivered in 1700, begins with the posit that extension is a universal attribute, belonging to both space and body, and that it has as a necessary feature the property of divisibility. He stipulates this to be true of geometric extensions and true of those of space and body: 'this property of extension appertains and necessarily adheres to all species of magnitude, as well to lines and surfaces, and as well to space as to body' (Keill 1720, p20). Divisibility, in the sense in which he is concerned, does not entail active separation into parts, as he outlines with reference to Euclid's tenth proposition in Book III:

²⁰⁸ See Hall (1980, pp. 202-213). Though Newton was initially happy to have Keill defend his case in the priority debate, and sometimes even collaborated with him on the content of the offerings, eventually Newton and the Royal Society came to recognise Keill to be over-zealous and saw him as prolonging a dispute that was increasingly seen by all sides as toxic. In Hall's words, they had 'begun to fear Keill as a truculent polemicist.' (Hall, 1980, p. 213)

[W]hen (...) he teaches how to bisect any right Line, he only shews how to assign a middle Point, dividing the given right Line into two equal Parts, which Point is the common Termination of both the Parts (...) This resolution of Magnitude into its Parts, is so intimate and essential to it, as that which has no Parts, as, for instance, a Point, is not said to be a Magnitude, but the Beginning or End of a Magnitude: nor can any Magnitude be produced by any Number of Points (...), every Magnitude is not compounded of Points but Parts, that is, other magnitudes of the same kind, whereof every one is constituted of other Parts, and each of these is still made up of others, and so on *in infinitum*.' (Keill 1720, 21)

Keill conjectures that divisibility is not really about acts of division, but rather about the potential for assigning a point to mark the position at which a division might take place. A point marks the middle of a bisected magnitude, and is not itself a magnitude nor part of one (except perhaps at the extremities), nor can its conjunction with any number of other points ever produce a magnitude.

Before the presentation of his proof (and reportedly in anticipation of the worries of 'some philosophers who attempt to banish Geometry out of Physicks'), Keill notes that since the common proofs of the infinite divisibility of extension are geometric in nature, some—'philosophers'—may question the force of these demonstrations in the matter of physical extension. For some (nominally, '*John Baptist du Hamel*'), geometrical hypotheses 'are neither true nor possible, since neither the points, nor lines, nor surfaces, as the geometers conceive them, do truly exist in the nature of things; and, therefore, that the demonstrations that are produced from these, cannot be applied to things actually existing, when none of these exist any where but our ideas.' (Keill, 1720, p. 23)

Berkeley would have protested similarly—even if we think that the abstractions performed in geometry are possible, we shouldn't think the conclusions of such projects carry over into the realm of particular things. 'In Geometry it is not prov'd that an inch is divisible ad infinitum.' (N247) Whereas, Keill argues that the proof that geometric extension is infinitely divisible proves equally that physical extension is infinitely divisible, so not only does he reject the claim that geometric hypotheses are false, but avows their truth and that their conclusions can be exported to the non-abstract world.

If one wants to reject the extra-geometrical conclusions of infinite divisibility proofs, one recourse seems to be to suggest that, given some geometric assumptions, one can produce a geometric conclusion stating the impossibility or relative absurdity of a limitation on divisibility, yet it's not immediately obvious what the consequences of such a conclusion are for physical extension, or for any system not explicitly contained by the assumptions. Presumably, the extent to which one thinks so will depend on the extent to which they believe the relations between geometric extension and physical extension hold. If geometric and physical extensions are isomorphic in the relevant sense, then perhaps there is a case to be made for results in the one domain being relevant in the other.²⁰⁹ If not, then surely pointing to this does some work in preventing the results of the one system being projected onto the other.

This issue is explored in the literature of contemporary philosophy of science in the field of proof relevance, as in the following example: 'A model of general relativity is a four-dimensional Lorentz manifold; thus, believing the general theory of relativity means believing that space-time has the structure of a four-dimensional Lorentzian manifold' (Halvorsen 2012, p3). If geometry is a model for all space, there needs to be some explanation of how the assumptions licensed in geometric proofs square with the actual world. '[T]he application of the model(s) to a particular empirical system requires the extra-theoretical assumption that the model(s) and the phenomena to which they are intended to apply are isomorphic.' (Thompson, 2007, p. 495) In a stronger claim, Bas van Fraassen argued that isomorphism cannot hold between a model and the world, because "being isomorphic" is a relation that holds only between mathematical objects. (van Fraassen, 2008) This line of resistance is open to a Berkeleyan, and given his views on pure mathematics, it's easy to believe that he would have agreed with van Fraassen:

Sense rather than Reason & demonstration ought to be employ'd about lines & figures, these things being sensible, for as for those you call insensible we have prov'd them to be nonsense, nothing.' (p. N46)

²⁰⁹ Even in contemporary philosophy of science, isomorphism doesn't necessarily licence proof transmission. A recent discussion of these issues takes place in 'What Scientific Theories Could Not Be' (Halvorson, 2012).

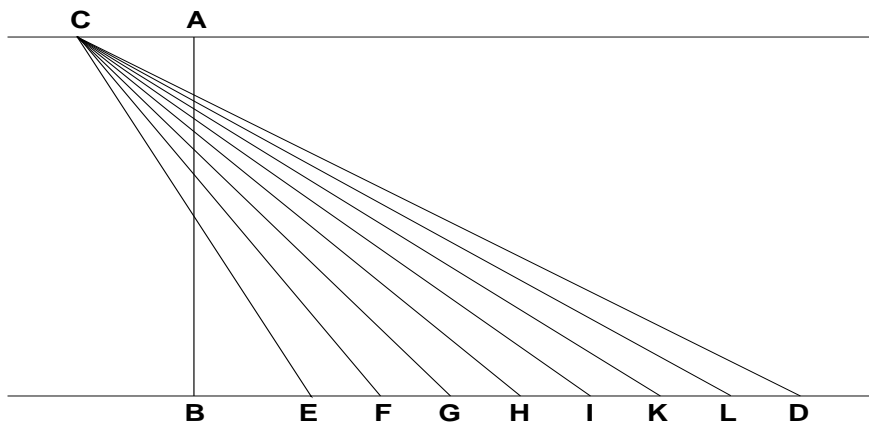
Keill attempts to block this sort of approach by saying that geometric hypotheses are just as 'real' as physical ones, or that the conclusions of geometric demonstrations apply in the physical case. He believes that the existence of bodies entails the existence of various mathematical entities: '(I)f body exists, there must of necessity exist real points, real lines, and real surfaces, even such as are conceived by the geometers(...).' In this sense, the reality of physical (public) objects gives reality to mathematical points, lines and planes. The argument proceeds in the following manner:

[I]f Body be given, that, since it is not infinite, has its Terminations; but the Terminations of Body are Surfaces, and those Terminations have no Depth: for if they had, they would thereby be Bodies, which Bodies would have still other Terminations, which would be Surfaces, and therefore there would be a Superficies of a Superficies. Either then this Superficies is destitute of all Depth, or not: if the first, we have what we require; if the latter, we come again to another Superficies, and so we should proceed *in infinitum*, which is absurd. (Keill, 1720, p. 23)

So, according to Keill, we begin with a three-dimensional physical object (say, a table) and agree that its finitude means it must have terminations or boundaries. Either these boundaries are two-dimensional or they are not. If they are, then, according to the demonstration, this is the plane as the Euclidean system describes it and we have what we desire. If the boundary in question is not, then we are still dealing with a three-dimensional object, which must have a two-dimensional boundary, so we run into an absurd infinite regress. Keill claims the same reasoning takes us from surfaces to lines and from lines to points: 'those Terminations are deprived of all Depth, and are therefore true Surfaces, and as they are conceived by the Geometers without any Depth, or such as have only Length and Breadth to constitute their Essence.' (Keill, Lecture 3: On the Divisibility of Magnitude, 1745, p. 23) The existence of a three-dimensional object thus entails the existence of a zero-dimensional one (which seems much more counter-intuitive than the move from three-dimensional to two-dimensional). 'Wherefore, if body may be supposed to exist, it necessarily follows, that geometrical surfaces, lines, and points, may be said not only as possible to be, but also to be actually existing.' (Keill, 1720, p. 23)

To the question of whether these lines are, in Keill's terms, equally material (for the current discussion we might want to say of the same nature as physical

objects), Keill says that they are obviously not, and nobody has ever claimed that. They exist in matter as its 'modes, terminations, or accidents' (Keill, 1720, p. 24). To the question of whether any truly geometrical (*i.e.* perfect) plane (surface) exists in nature, he weakly responds that that is not something we can affirm until we have seen all the objects in the universe, and 'view'd them thro' a microscope' (Keill, 1720, p. 24). He then moves to the articulation of the proof which he takes to represent a decisive argument for the infinite divisibility of all extension.



Operating on the supposition that what is proved in the geometric realm holds for the physical realm, Keill proceeds.²¹⁰ The proof is of the second kind outlined earlier, where a geometric construction is used to claim there can be no constraint on divisibility. We have three primary lines, AC, BD and AB. BD and AC are parallel, with AB perpendicular to and intersecting both. Begin with the assumption that AB is only divisible into a finite number of parts p . Take a point C on AC, on one side of the line AB. On the other side of AB (that not containing C) assign at least p number of points on BD (see points E, F, G, H, I, K, L, D above) and allow that they form connecting lines with C (*i.e.* generating lines CE, CF, CG, CH, CI, CK and CL). Either each line from C to BD divides AB into distinct parts (as many parts as there are right lines) or it does not. The only way the latter can be true is if two lines from C to BD cut AB at the same point. This is not possible since all of the lines from C to BD intersect at C, and as right lines they cannot cross twice on a straight trajectory, nor can they share a segment and be right (geometrically straight) unless they are

²¹⁰ For Keill's construction, see Keill (1720, pp. 26-27).

related as part and whole, which, by definition they are not. Therefore, AB is divided into as many parts as there are right lines. Given Euclid's first two axioms (that a straight line segment can be drawn between any two points, and that a straight line segment can be extended indefinitely in a straight line), and the fact that there will be at least as many divisive parts of AB as there points on BD, the proof demonstrates that for any p or n such that $p+n$ is the number of stipulated finite parts of AB, it can be shown that AB can be divided into a greater number of parts.

Given the infinite extendibility of BD (axiomatic) and the resultant infinity of contained points which can be made terminations of lines by extensions from C (through AB), and, given the two aforementioned Euclidean maxims (that straight lines can intersect but once and that continuous straight lines with different slopes cannot share sections), Keill concludes that AB (stipulated finite) must be infinitely divisible, or at least as infinitely divisible as the line BD is infinitely extendible.

This sort of proof—he offers two others of a similar design in the same chapter—is thought to show that geometric extension is necessarily infinitely divisible. Keill introduces other arguments that suggest that it is impossible to resist the inference from the infinite divisibility of geometric extension to the infinite divisibility of 'physical' extension.²¹¹ He says:

There might be innumerable other Demonstrations produced, to shew the infinite Divisibility of Quantity, and entirely to overthrow the Hypothesis of Indivisibles. (...) The Arguments hitherto alledged (sic), have not less force to compel the Assent, than any Demonstration in *Euclid's Elements*; insomuch that it is as impossible to weaken them, as to destroy the Fundamentals of Geometry, which no Age or Sect of Philosophers has been ever able to effect. That therefore the Philosophers may avoid the Force of these Arguments, they distinguish betwixt a Mathematical and a Physical Body. Being compelled by the Force of the Demonstration, they readily allow a Mathematical Body may be divisible *in infinitum*; but they deny that a Physical Body may

²¹¹ I take it that by 'physical' Keill means all non-geometric extension or the extension of physics. He says in the introduction to the section he states that extension is a universal attribute of space and body. Berkeley's metaphysics attempts to re-explain physical objects in terms of perceptions of ideas (removing from the explanation the supposed external and independent material that purportedly causes our ideas of them and redefining the objects in terms of the ideas alone). So, for him there is a burden of showing that his account can deal equally well with claims about objects (such as that they are infinitely divisible if the geometry proves it), or else of invalidating claims about physical objects that are impossible to reconcile with his framing of his metaphysics.

be always resolved into still farther divisible Parts. But what, I would know, is a Mathematical Body, but something extended into a triple Dimension? (...) a Physical Body is extended after the same manner: wherefore Divisibility depends on the Nature and Essence of Extension itself, and owes to it its Origin, it is necessary that it must agree to all Extensions, whether Physical or Mathematical. For, to use a Logical Expression, whatever is predicated of any *Genus*, is predicated of all the *Species* contained under that *Genus*. (Keill, 1720, p. 6).

The Berkeleyan response to this is to grant that this demonstration is indeed as sure as any in Euclid. However, given Berkeley's views on the coherence of the foundations of Euclidean geometry, that is not necessarily to pay it much compliment. Regarding Keill's question on the nature of a mathematical body, I think Berkeley would have a complicated answer, but he would be in a position to say, there are important foundational differences to do with the assumptions that frame the mathematical (Euclidean, in this instance) system that make the putative shared existence of mathematical and physical objects in three-dimensional space misleading.

Keill rejects the legitimacy of distinguishing between what may be proven of geometric extension geometrically and what may be proven of physical extension geometrically by claiming that really they are of a kind; mathematical and physical extension are just species of the genus extension, which is inextricably linked to divisibility. Keill ignores the fact that one cannot take a rule for one species and automatically extend it to the genus. Even if one considers geometric extension as emblematic of all extension, that requires statement and proof itself, since, for many, it looks like geometric extension is an obvious special case of extension, rather than the archetype of the genus.

The consequences of Keill's views are that the axioms of Euclidean geometry define all of science and experience. Since, according to Keill, the axioms dictate the theorems (so, all those statements considered true within the system), those theorems are true of all analysis. They constrain not just the geometric objects outlined by Euclid, but all objects, since as Keill claims, it is possible to analyse physical objects in terms of mathematical objects, and therefore they must be describable in the system in such a way that makes what is true of geometry true for them.

3.7

Conclusion

Given Berkeley's belief that many of the axioms of Euclidean geometry are incomprehensible, we end up with the following position. Berkeley thinks that, as defined, many of the essentially primitive entities of classical geometry straightforwardly lack reference. Where Keill says all objects can be regarded as being in some sense *composed of* fundamentally Euclidean parts, Berkeley contends that there are no objects that have the properties of the points, lines, planes etc.... so not only is it not true that all our perceptions of objects can be analysed in terms of geometric properties, there is literally nothing in experience that corresponds to them. According to Brook:

Berkeley would as a matter of course take all of classical (pure) geometry to be an intentional fiction; the points, lines, planes, etc., related by the postulates are, strictly speaking, referentially empty. (...) We can illustrate points, say by a chalk mark on a blackboard or (pace Hume) an ink dot. But it's not simply that, aside from position (location), we can (as we do) ignore the mark's other dimensions (...). A Euclidean point must satisfy the relations specified in the postulates, (e.g., two straight lines intersect at only one point) and that's not observable for all pairs of lines visually taken as straights. (Brook, 2012, p. 5 & footnote 19)

Obviously the influence of an inflexible empiricism is important, in that Berkeley equates knowledge with knowledge by experience. Yet, Keill's claim that physical objects are essentially geometric involves a procedure of inspecting their surfaces that should allow one to say that Keill accepts that knowledge of physical bodies should be consonant with experiences of them. In the notebooks, Berkeley conspicuously holds that some of the results of Euclidian geometry are false, and wonders in virtue of what geometry could be said to represent physical extension. The following comment from the notebooks is significant:

Qu: whether geometry may not be properly reckoned, among the mixt mathematics. Arithmetic and algebra being the only abstracted pure

i.e. entirely nominal. Geometry being an application of these to points.
(N770)

In his earliest philosophy, Berkeley wondered if geometry was not simply a type of applied mathematics. The story we get in the *Principles* mentions what Berkeley imagined to be the historical evolution of number talk:

It is natural to think that at first, men, for ease of memory and help of computation made use of counters, or in writing of single strokes, points or the like, each whereof was made to signify an unity, that is, some one thing of whatever kind they had occasion to reckon. Afterwards they found out the more compendious ways, of making one character stand in place of several strokes, or points. And lastly, the notation of the Arabians or Indians came into use, wherein by the repetition of a few characters or figures, and varying the signification of each figure according to the place it obtains, all numbers may be most aptly expressed. (*Principles*, §121)

This is in part why Berkeley claims that in arithmetic we regard signs, not things, and the foundation for the claim that Berkeley was an early proponent of mathematical formalism.²¹² If we take seriously the suggestion that he makes in the notebooks about geometry being one of the ‘mixt mathematics’, it seems that he thinks the mathematical practice of his time concerns the application of mathematical principles (which he takes to be formalist in nature) to a system of mathematical points (which he takes to have nothing to do with the actual world). By the time of the *Principles* Berkeley says that the proper object of geometry is perceived extension. Though Euclidean geometry is thought in practice to be some sort of idealization of actual extension, Berkeley thinks that there are fundamental differences between actual extension and the Euclidean conception. These differences prevent the two systems from having the sort of mutual resemblances (that one finds in truly isomorphic systems) that facilitates inferences from results in the one system to results in the second. As Brook notes, many of the principal terms of Euclidean geometry are referentially empty. In Euclidean geometry ‘that which has no parts’ is a mathematical point and is non-extended and forms no part of any mathematical extension. In Berkeley’s positive metaphysics and account of perception ‘that which has no parts’ is a *minimum sensible* and is coloured (which for Berkeley means it must be extended).

²¹² This claim is assessed in Schwartz (2010).

Robert Fogelin makes an interesting remark on the putative simplicity of infinite divisibility with respect to 'physical space vs. pure space'. He says:

[I]sn't it just obvious that a line is infinitely divisible, for if we cut it in half, there will always be something left over to cut in half again? But is that even true? With a pencilled line we finally get down to gaps in between the pieces of graphite, and whatever method is used to produce the line, we will finally arrive at atomic gaps where there is nothing available to divide.' (Fogelin, 1988, p. 68)

Further to there existing no entities (*e.g.* perfect circles) like those in the Euclidean realm in the physical realm, there is the additional issue that we cannot, even in principle, perform the tasks presumed basic in the Euclidean realm in the physical realm. If we take seriously Berkeley's suggestion that he thought geometry as practiced was just a case of applied mathematics (in which mathematical ideas were applied to a system of abstract points), it becomes clear why he thought so negatively of the idea that we should understand empirical space and objects in terms of the principles of geometry.

Whether a system founded in sensible minima is coherent or not, there is an actual limit to how small you can get something to be in an empirical act of division, and no person has the capacity to extend a line into infinity *in practice*. This is why Keill's proof of infinite divisibility won't hold water for Berkeley—it may be interesting to think about, as a procedure where we apply mathematical ideas to a set of points, but it has got nothing to do with actual extended objects. Though geometric extendability and divisibility seem natural bedfellows, the relationship between physical (in practice) extendability and divisibility is not intuitively obvious at all.

In *Life of Berkeley*, A.A. Luce remarks on Berkeley's responses to the notably modern course material taught during his undergraduate at Trinity College, Dublin:

The mathematical doctrine of infinite divisibility was commonly regarded as furnishing evidence for the existence of matter; hence Berkeley's special interest in infinitesimals. (*Life of Berkeley*, 36)

Here, Luce picks up on Berkeley's justifiable anxiety at the prospect of exporting truths that emerge as theorems in geometry into the metaphysical realm. For Berkeley, infinite divisibility supports materialism, doesn't adequately track

practice, and lacks theoretical coherence. This is in the period when Berkeley's philosophy of mathematics was at its most strongly revisionist. As such, his worry that a system he thought was in many respects simply false could be thought to contain the truths of the empirical world (and in this case render implausible his own philosophy) is easily understood. Similarly, given Berkeley's epistemological instincts, the notion that a set of axioms, designed to describe idealised abstract entities, should be seen as the foundational rules for the physical world is a troubling one. It is thus easy to explain this early preoccupation with infinity and infinite divisibility as vital in his thinking about the prospects for his philosophical outlook. In the notebooks, we see his awareness of the relationship between divisibility and the existence of matter:

Infinite divisibility of extension does suppose the external existence of extension but the later [sic] is false, ergo the former also. (N26)

Given the tendencies of many contemporary thinkers to make the sort of claims that Keill made,²¹³ it's not surprising that arguing persuasively against any kind of infinite divisibility was a central ambition of Berkeley's early strategy (e.g. *NTV* §54). A holistic picture that takes into account the enormous influence that mathematical views had on his early philosophical development is important in showing that these strong views were still very alive in the Berkeley of the *NTV* and *Principles*. Thus, in the period where Berkeley's philosophical priority is advancing his own metaphysics, hostility to mathematics, mathematicians and mathematical metaphysics (in the ways characterised above) are dominant motivating forces.

²¹³ Berkeley's discussion of Andrew Baxter's reception of his philosophy in his correspondences, and in §50 of *The Analyst* is noteworthy on this score.

Chapter 4: The Philosophy and Mathematics of *The Analyst*

Analyst

4.1

Introduction

The literature on the mathematical merit of Berkeley's criticisms of the technical points of calculus is sizeable, and much of what there is to say about that period of mathematics—including on the priority debate and the foundations of the early calculus—has been said.²¹⁴ As Rupert Hall has said of the priority debate, 'what happened, mathematically speaking, in the 1660s and 1670s is no longer in doubt' (Hall, 1980, p. 1). The tribal mathematical consequences of the row have also been well documented, and there is little doubt that the entrenched nature of the exchange ultimately did damage to the progress of subsequent British mathematics. In their zeal to defend Newton and his calculus (the purported mathematical superiority of which had been such an important part of the dispute), British mathematics fell behind by failing to get on board with important mathematical adaptations that they regarded as tainted by association with the legacy of Leibnizian calculus. Here, the profoundly important move to functions and the general de-geometrizing direction of continental calculus were fundamental. Even Maclaurin's *Treatise of Fluxions* (1742), though unquestionably a masterpiece, is definitively nested in the Newtonian method and philosophy.²¹⁵ In the words of Elaine Koppelman:

²¹⁴ For discussion of the philosophical issues raised in the priority debate, see Hall (1980), Guicciardini (1989), (1999) and Kitcher (1973). On the reception of *The Analyst*, see Jesseph (1993), Jesseph and Berkeley (1992), Bell (1940), Chapter 3 of Guicciardini (1989), Grattan-Guinness (1969) and Section 18.A of Fauvel and Gray (1987).

²¹⁵ For a more comprehensive discussion of Maclaurin and Newton, see Guicciardini (1999, pp. 255-260). The social and interpersonal issues that explain these

While modern calculus was being created by the Bernoullis, Euler, Lagrange and Laplace, the Newtonian school clung to a clumsy notation and, perhaps even more important, to a reliance on the geometric methods out of a misguided belief that these represented the spirit of Newton. (Koppelman, 1971, p. 155)

Within the literature on Berkeley's involvement there are two particularly popular positions—that of Newtonians who think Berkeley mischaracterised Newton's presentation of the calculus, and those who think *The Analyst* criticisms ultimately salvaged and disciplined a body of work that had paid insufficient attention to its foundations, even if it took until the 19th century for the theory to find a secure footing.²¹⁶ The first camp would include James Jurin, John Walton and Colin Maclaurin, as exemplified in their quick responses to Berkeley's work.²¹⁷ In the latter camp are, among others, Wisdom, Jesseph, Cajori, Strong, Bell, and Robinson.^{218,219} Guicciardini, one of the key figures in this analysis, pursues something like an intermediary line, acknowledging the 'careless approach to foundations of fluxionists before 1734' (1989, p. 41) while judging that the theory need not suffer the problems Berkeley alleged, as exemplified by Maclaurin's

developments between Newton and his countrymen are laid out clearly in Chapter 7 of Guicciardini (1999), Koppelman (1971) and Grabiner (1997).

²¹⁶ In the case of calculus explicitly invoking infinitesimal-like entities, the wait for a rigorous foundation was considerably longer. It wasn't until the 1960s that Abraham Robinson, utilising non-Archimedean hyperreal ordered fields in a newly advanced model theory, established that 'Leibniz's ideas can be fully vindicated and that they lead to a novel and fruitful approach to classical Analysis and to many other branches of mathematics.' (Robinson, 1966, p. 2) For more on the rigorization of calculus, see Chapter 18 of Fauvel and Gray (1987). Of course, this theory is not without its critics, and one cannot help but see a little bit of Berkeley in Errett Bishop's criticisms of nonstandard models and the non-constructive approach they take.

²¹⁷ Jurin (1734), Walton (1735), (1935, p. b) and Maclaurin (1742).

²¹⁸ Wisdom (1939), Jesseph (1993), Cajori (1917), Strong (1957), and Bell (1940).

²¹⁹ In *Continuity and Irrational Numbers* Dedekind also explains that in 1858 he was moved to the considerations that prompted that number theoretic treatise by worries about geometrical calculus foundations: 'I found myself for the first time obliged to lecture upon the elements of the differential calculus and felt more keenly than ever before the lack of a really scientific foundations for arithmetic.(...) in proving the theorem that every magnitude which grows continually, but not beyond all limits, must certainly approach a limiting value, I had recourse to geometric evidences. (...) For myself this feeling of dissatisfaction was so overwhelming that I made the fixed resolve to keep meditating on the question till I should find a purely arithmetic and perfectly rigorous foundation for the principles of infinitesimal analysis.' (Dedekind, 1963)

satisfactory subsequent handling of them (again, without any significant departure from any strongly Newtonian commitments).

Another view is that *The Analyst* pays insufficient heed to Leibniz's mathematical philosophy, and that his equivocation between the calculus of Newton and Leibniz is unfair to Leibniz, particularly given the latter's fictionalism.²²⁰ Further, Leibniz's response to Nieuwentyt's criticisms of his calculus was in part that in quibbling over the foundations he was ignoring the practical value of the achievements that the mathematics facilitated. Thus, it is fair to believe that Leibniz's mathematics was a poorly chosen target, given their similarly instrumentalist sympathies.

In this chapter I offer a critical summary of *The Analyst Controversy*.²²¹ In the summary, I analyse the relevant features of the mathematical landscape at the time of Berkeley's writing, and characterise and explicate Berkeley's engagement with the calculus in *The Analyst*. I pay particular attention to its inheritances from previous critical engagements with similar mathematics, especially that involving Bernard Nieuwentyt. I also offer a brief account of how these early proposals relate to more recent versions of similar mathematics.²²² In summarising the arguments

²²⁰ For discussion of Leibniz's fictionalism, see Katz and Sherry (2013), especially the following quote from a 1706 letter (Leibniz to Des Bosses): 'Philosophically speaking, I no more admit magnitudes infinitely small than infinitely great ... I take both for mental fictions, as more convenient ways of speaking, and adapted to calculation, just like imaginary roots are in algebra.'

²²¹ By the *Analyst Controversy*, I intend the work *The Analyst* itself, and the ensuing exchange, including Berkeley's responses, the *DFM*, and *RNR*. Sampson, in describing the exchange of letters following Berkeley's later works, puts it nicely: "'Alciphron"' the "Analyst," and "Siris" were each the parent of a brood of tracts.' (Berkeley & Sampson, 1898, p. 510)

²²² One (I think unfair) criticism of Jesseph's *Berkeley's Philosophy of Mathematics* was that he didn't see subsequent mathematical developments as bearing too heavily on the interpretation of that historical material. It seems to me that it's perfectly acceptable to write a fairly comprehensive account of Berkeley's engagement with mathematics in his philosophical writing, and limit oneself to the mathematics of Berkeley's time and earlier. In a review in *Modern Logic*, Irving Anellis criticised Jesseph's claim that contemporary (to 2001) mathematics wasn't hugely relevant to the historical issues presented in his book. Anellis says: 'After writing that "contemporary model theory allows for the development of a consistent theory of infinitesimals," Jesseph goes on to assert that [T]he relevance of current accounts of infinitesimals to issues in the seventeenth and eighteenth century is rather minimal...' This is *wrong* and would assuredly have come as much as a surprise to Robinson as to anyone familiar

of the Body of *The Analyst*, I emphasise the elements of the text that are key to my interpretation of the text as a kind of straight-faced satire—particularly those in tension with *Alciphron*, that encourage a more creative reading of Berkeley’s intentions in *The Analyst*. I look at the least studied element of *The Analyst*, the Queries that close the book, and offer a novel account of the relationship between the two parts of the text. I support my reading by reference to the articles Berkeley published in response to the controversy following *The Analyst*’s publication.

4.2

The Analyst: A Critical Summary²²³

The principal contents of *The Analyst* are well known by Berkeley scholars, and yet, to offer no summary at all would be obviously remiss, especially since I dispute significant parts of the typical interpretation, and I suspect the best way to make my case is gradually.

The book contains: front matter, including a synoptic table of contents; the main text of *The Analyst*, comprising 50 sections (the ‘Body’); and, a set of 67 queries (the ‘Queries’).²²⁴ Berkeley’s table of contents gives a preview of the

with his work (...).’ (Anellis, 2001) To reiterate, I think this is an unfair demand of Jesseph, but its having been made shows some appetite for consideration of the correspondences between the work of the old analysts and these newer theories, so I have tried to provide some detail on this front with respect to the work of Robinson and Bell.

²²³ Given the frequency of quotations in this section, I have abbreviated the references. Except where explicitly cited, quotes in this summary are from the passages of *The Analyst* highlighted in bold at the beginning of the relevant section; instead of a full reference, I have just given the section number.

²²⁴ The Queries follow a trend traceable to the Royal Society and their recommendations surrounding documentation of biological specimens. Peter Anstey: ‘[T]he vast quantities of knowledge and of specimens arriving from the new world needed to be organized, the inquiries of travellers needed to be directed towards specific ends. Moreover, natural histories themselves had to be ordered. To this end, members of the early Royal Society, following Francis Bacon’s recommendations, deployed a new genre of natural philosophical writing, namely lists of queries or articles

material contained in each section of the Body and those previews are helpful in providing a summary of the main contents, since they emphasise what Berkeley thought was the main achievement of each section.²²⁵ Two works—*Defence of Free-Thinking in Mathematics* and *Reasons for not Replying to Mr. Walton's Full Answer*—follow *The Analyst* in 1735. They respond (in particular, but not exclusively) to James Jurin and John Walton respectively. In what follows, I summarise the features of the controversy, emphasising the elements I think have been overlooked or misread in its interpretation, and attending to the correspondences and (telling, and in my view intentional) contrasts with the contents of *Alciphron*.

§1 & §2: §1 and §2²²⁶ of the Body represent a strikingly impassioned opening to a treatise on calculus. In his preview of the sections (in the contents) he describes these sections as follows:

§1 Mathematicians presumed to be the great Masters of Reason. Hence an undue deference to their decisions where they have no right to decide. This one Cause of Infidelity.

§2 Their Principles and Methods to be examined with the same freedom, which they assume with regard to the Principles and Mysteries of Religion. In what Sense and how far Geometry is to be allowed an Improvement of the Mind. (*The Analyst*, Contents)

Of note here is the sense that, taken together, (1) the social status of mathematicians, vaunted as supremely able reasoners and (2) the frequently

of inquiry. Of course, it is not as if the humble query had never been deployed in natural philosophy before. However, the early Royal Society followed Bacon in using such lists to structure the scope and depth of particular natural philosophical inquiries within a broadly Baconian agenda—the sort of agenda spelt out, for example, in Bacon's *Parasceve*. From the early 1660s on we find lists of queries for researching all sorts of phenomena, and some of the early issues of the *Philosophical Transactions*, which were first published in 1665, are dominated by such lists' (Anstey, 2011, p. 61).

²²⁵ The Luce and Jesseph volume containing *The Analyst* doesn't include the synoptic table of contents. Jesseph's *De Motu and The Analyst: A Modern Edition with Introductions and Commentary* does include the contents, and it is that version I will cite when referring to this section. It cannot be guaranteed with certainty, as far as I can tell, that these summaries were written by Berkeley, rather than a publisher, but it does seem highly likely. If not, they were either approved by him, or are the work of someone much closer to the text than the modern editors, and so, still constitute an important source for understanding the text.

²²⁶ The polemical nature of §1 and §2 is discussed further in the final chapter.

alleged vulnerability of religion under the sort of analyses favoured by mathematicians, jointly constitute a cause of religious infidelity. This idea might be considered a rough converse to the kind of situation described by Huw Price (Price, 2015) as a 'reputational trap', where, in his essay, those publically considering or even attempting to engage the issue of 'cold fusion' low energy nuclear reactions are professionally tainted by the historical sketchiness and dubiousness of that experimental field. Berkeley alleges that the prestige of mathematics means that even bad arguments launched from something like the standpoint of that discipline achieve greater esteem (and less scrutiny) than they would without this positive association. The combination of that esteem and absence of scrutiny means that those unwilling to really examine theological issues themselves (the vast, busy majority) may defer to the position with the better reputational footing.

A matter that merits attention here is the issue of the overlap between two groups criticised in *The Analyst* and the surrounding Berkeleian literature: (1) freethinkers, and (2) the pro-logic and pro-mathematics philosophers, perhaps especially including those regarded by Berkeley as taking Newton to be too unfailing an authority. There are cases where it seems clear that there is no overlap, in such a way that makes Berkeley's seemed insistence that (1) and (2) are the same for all intents and purposes look strange and misjudged. For example, Toland and Mandeville are comfortable members of (1) but are harder to place in (2), since both can be read as critical of the sort of philosophical approach that defines that group. However, there are also clear examples of stronger and weaker overlap. Even in Toland's case, he has been read as endorsing Newtonian physics, and quotes him sympathetically in the closing of *Letters to Serena*, citing his views on the dependence of 'other Phaenomena of Nature' on unknown forces, and ruling that '[w]hat those particular Forces and Figures may be, with their Reasons and Degrees, none in the world is so well able to discover and reduce into an intelligible System, as the most excellent Author.' (Toland, *Letters to Serena*, 1704, p. 234)

An even clearer endorsement of Newton is presented by Toland at the end of his Leibnizian critique (in the *Remarques Critiques*). As discussed in my previous chapter, Toland follows his anti-mathematical sentiments with a moderating dictum that 'a man can be an excellent *mathematician*, without being even a

mediocre *philosopher*; but he can never be a profound *philosopher* without being a passable mathematician' (Toland, Francks, & Woolhouse, 2000, p. 109). Following this, Toland considers Newton in light of this standard.²²⁷

How lucky is our celebrated *Newton*, who possesses both these qualities, so rarely united in the same person! (Toland, Francks, & Woolhouse, 2000, p. 109)

In fact, a sense that Toland was a Newtonian has been regarded by Irish historians as a reason Newton was judged suspiciously by certain Anglicans:

Toland fully accepted Newton's physics. In fact he was one of the first writers to bring word of Newton's science into France. However, he argued that Newton's interpretation of his own laws was not the only possible interpretation. The acceptance of Newton's physics in *Letters to Serena* by the most notorious freethinker of the time had the effect of making Newton somewhat suspect to orthodox Anglicans. (Mc Guinness, 1996)²²⁸

I think the best response here is just to acknowledge that Berkeley is an unfair reader and uncharitable scholar of his opponents (especially Mandeville), and tends to read those guilty of one sin as guilty of all possibly related sins. Such an acknowledgement should not count as any kind of endorsement of Berkeley's position on the relevant philosophies as authoritative, but it is important to understanding the parts of Berkeley's thought which trade on this kind of equivocation. Also, the clearer overlapping examples—Joseph Raphson, whom Toland also cites approvingly as 'ingenious' in *Letters to Serena*, and Andrew Baxter—are sufficient to show that, for Berkeley, a number of the people whose views on mathematics and philosophy he liked least were fans or friends of Newton. One reference to Raphson in a letter to the American Samuel Johnson

²²⁷ In the relevant climate, with the priority debate having really broken out in 1711, Toland's decision to append a glowing reference to Newton at the end of a piece criticising Leibniz would likely have been read as constituting a further contrast between the praiseworthiness of Newton and a general negative reception of Leibniz.

²²⁸ In his review of Toland and Leask (2013), William Uzgalis notes describes Toland as one who 'appropriates Isaac Newton and claims the *Principia* is compatible with Toland's Leibnizian interpretation of matter as essentially active.' He also claims that orthodox Anglicans, on reading *Letters to Serena* would 'be horrified that Newtonian science was compatible with a Spinozistic or Leibnizian material system (...) and by 'showing that Newtonian science is equally compatible with another system that presumably is not compatible with Anglican orthodoxy.' (Uzgalis, John Toland's *Letters to Serena* ed. by Ian Leask (review), 2016, p. 506)

(dated March 24th, 1730) neatly draws together in Berkeley's thinking these strands of heresy, Newton-association²²⁹ and mathematical philosophy:

As to space, I have no notion of any but that which is relative. I know some late philosophers have attributed extension to God, particularly mathematicians: one of whom, in a treatise, *Se Spacio (sic Spatio) Reali*, pretends to find out fifteen of the incommunicable attributes of God in Space. But it seems to me, that they being all negative, he might as well have found them in nothing: and that it would have been justly inferred from space being impassive, uncreated, indivisible, etc., that it was nothing, as that it was God.

Sir Isaac Newton supposeth an absolute space different from relative, and consequent thereto, absolute motion different from relative motion: and with all other mathematicians, he supposeth the infinite divisibility of the finite parts of this absolute space: he also supposeth material bodies to drift therein. Now, though I do acknowledge Sir Isaac to have been an extraordinary man and most profound mathematician, yet I cannot agree with him in these particulars. (Hight, 2012, p. 318)

Of greater note for the purpose of my interpretation of the text is Berkeley's explicit reference to the fact that he will be investigating calculus, and the principles and methods it employs, *with the liberty of one criticising religion* (and its principles and methods) as inadequate under the criteria typically used to analyse ideas of science and mathematics. It should be clear that Berkeley, in conducting a freethinking analysis of calculus, is not arguing purely from his own point of view, and hence, the failings of calculus highlighted by that analysis are not a reliable indicator of Berkeley's ultimate views on calculus.²³⁰ In fact, given Berkeley's history of engagement with freethinking, we might expect there to be little overlap between his and the freethinker's positions.

It is obvious that Berkeley thinks the freethinker does great damage by ignoring the social and moral role of religion in assessing its value and the coherence of its concepts. By concentrating only on whether its ideas meet the

²²⁹ Importantly, Raphson also wrote a history of fluxions (Raphson, 1715), and was one of the few people, along with Edmund Halley, that Newton allowed to see his mathematical papers. Berkeley also mentions Raphson in the notebooks and 'Of Infinites'.

²³⁰ Thus, when I refer to 'Berkeley says', 'He argues' etc. for the duration of the summary of the Body, it should be remembered that I mean Berkeley, in his guise as freethinking investigator.

Lockean/Cartesian idea constraint (as he thought freethinkers such as Collins and Toland did), or whether its inferences are as sound as those of traditional geometry and logic, they misunderstand the role of religion in the life of the believer, and in the wellbeing of society. When such critics concentrate only on the logical and formal semantical merit of a body of thought—especially one that is not committed to the kind of naturalism and explanatory transparency that sciences and mathematics are—they miss the point completely. We are spoiled with examples of Berkeley criticising ‘minute’ freethinking methodology, from his articles in Steele’s *Guardian* to the book-full of them delivered in *Alciphron*. Recall Euphranor’s caution that “whensoever men quit particulars for generalities, things concrete for abstractions, when they forsake practical views (...) for barren speculation (...) they will be sure to embarrass themselves with difficulties and disputes’, and importantly, that Berkeley intended this comment to be relevant and decisive ‘be the science or subject what it will’ (*Alciphron*, D7 §18, my italics).

I argue that we are much more entitled to believe Euphranor represents Berkeley’s mature views at this point than we are to believe that content delivered after Berkeley remarks that he will ‘claim the privilege of a Free-Thinker,²³¹ and take the Liberty to inquire into the Object, Principles, and Method of Demonstration admitted by the Mathematicians of the present Age, with the same freedom that [they] presume to treat the Principles and Mysteries of Religion.’

§3 & §4: In these sections Berkeley offers opening remarks about Newton’s calculus, outlining his understanding of it, and emphasising that it is the central focus of contemporary geometry. Though many of the techniques of what we now call calculus were available in various works prior to Newton (and Leibniz), it was the discovery and explanatory articulation of the Fundamental Theorem of the Calculus (the theorem expressing and characterising the relationship between integral and differential calculus, and the relationship between problems of quadrature and those of tangency) that significantly increased the universal fruitfulness of the theory. Berkeley outlines the relationship between the various parts of Newton’s calculus: this includes the definition of the relationships between

²³¹ I discuss this in Chapter 2, citing instances of Euphranor delivering distinctively Berkeleyan philosophy in numerous discussions.

‘velocities’, ‘fluxions’, ‘moments’, and ‘quantities’ etc. In §4 he introduces the notion of second and third order fluxions (which are fluxions of fluxions, and fluxions of fluxions of fluxions), noting that the analysts allow for fluxions raised to powers *ad infinitum*.

Sense and imagination, he says, are ‘very much strained and puzzled to frame clear Ideas of the least Particle of time, or the least Increments generated therein: and much more so to comprehend the Moments, or those Increments of the flowing Quantities in *statu nascenti*, in their very first origin or beginning to exist, before they become finite Particles.’ (§4) To form such an idea is beyond the scope of his abilities, and he believes it will present an insoluble difficulty to anyone who honestly considers it. That one must further be able to conceive of an infinite array of additional levels of such notions, each infinitely smaller than the previous, each representing a new ‘incipient Celerity of an incipient Celerity’, makes matters even more difficult. That Berkeley is, in essence, criticising the fluxion on the grounds of the difficulty of forming a clear idea of it should remind the reader of the criticisms of religious ideas on these same grounds.²³²

§5 & §6: Berkeley introduces the calculus of the ‘foreign mathematicians’, who prefer the use of ‘differences’ (‘Increments or Decrements infinitely small’) instead of fluxions. Berkeley seems to have been quite familiar with many aspects of the priority dispute, as well as knowledgeable on some of the critical responses to Leibniz’s early publication of numerous results in the *Acta Eruditorum*. In the records of the sale of the books of the Berkeley family, entry 1445 reads: ‘Acta Eruditorum, from 1682 to 1701, both inclusive (with Index and Supplements), 24 vol — *Lips* 1682’. It’s difficult to believe that these could have been picked up by a member of the Berkeley family other than the philosopher himself, since he refers to the contents of them in his early work—in §130 of the *Principles*, he refers to the ‘Scruples and Disputes among the Geometers of the Present Age’ and summarises

²³² There are many examples of rhetoric demanding clear and distinct ideas of religious terms. For example, the Unitarian John Biddle (who inspired Toland): ‘God, who has all Men to be saved, and to come to the knowledge of His Truths, has made his Revelations so intelligible, as to make it plain and easy to all Men, as well as to idiots, as to the most subtle Philosophers. Therefore it is, God never uses any Term to teach us his Mysteries, but what we have a clear and distinct idea of’ (Biddle, 1691, p. 23).

the position of Leibniz and then that of Nieuwentyt on the question of higher order infinitesimals.

Nieuwentyt was one of the early critics of the foundations of the Leibnizian calculus, arguing that the theory should restrict the possible operations on and orders of infinitesimals. Leibniz responded to Nieuwentyt's initial complaints in *Considerationes*²³³ and *Analysis Infinitorum*²³⁴ in the *Acta Eruditorum* in 1695, and further replies from Nieuwentyt were handled by Jacob Hermann (a student of the Bernoullis).²³⁵ I will return to Nieuwentyt's criticism later in discussing Berkeley's *fallacia suppositionis* criticism.

In §5 and §6 Berkeley criticises the initial entities and then higher order versions again (replacing talk of fluxions and velocities for that of quantities), emphasising the inconceivability of the first order entity, and that further levels must represent an 'infinite Difficulty'. He also criticises the strange sense of additivity they suggest: since, say, a first order infinitesimal must be infinitely larger than an infinite array of higher order infinitesimals (which Berkeley says on this theory are real magnitudes—Leibniz would surely dispute this), it is still the case that no amount of these infinitesimals can increase the magnitude of a finite quantity:

As there are first, second, third, fourth, fifth, &c. Fluxions, so there are Differences, first, second, third, fourth, fifth, &c., in an infinite Progression towards nothing, which you still approach and never arrive at. And (which is most strange) although you should take a Million of Millions of these Infinitesimals, each whereof is supposed infinitely greater than some other real Magnitude, and add them to the least given Quantity, it shall ne never the bigger. (*The Analyst*, §6)

§7: In §7 the ad hominem is rearticulated. The central objective of the book is to demonstrate the claim: '*Mysteries in faith unjustly objected against by those who admit them in Science.*' Of course, Berkeley is not committed to the view that the criteria given by those criticising religion should be applied in that case (or even

²³³ Full title: *Considerationes circa Analyseos ad quantitates infinite parvas applicatae Principia, & calculi differentialis usum in resolvendis problematibus Geometricis* (Nieuwentyt, 1694)

²³⁴ Full title: *Analysis infinitorum, deo Curvilinearum proprietates, ex polygonarum natura deductae* (Nieuwentyt, 1695)

²³⁵ See Nagel (2008) for a deeper discussion of Hermann's defence of Leibniz.

in the scientific case, *per Alciphron*), but since he believes his opponents are so committed, his aim is to show that the same criteria will show infinitesimals or fluxions to be similarly wanting. ‘That Men, who have been conversant only about clear Points, should with difficulty admit obscure ones might not seem altogether unaccountable. But he who can digest a second or third Fluxion, a second or third Difference, need not, methinks, be squeamish about any point in Divinity.’

§8: §8 represents the closing of the introductory phase of the text and warrants some discussion, since it represents an important phase on my interpretation. From §9 on, the main topic is the mathematics itself, and Berkeley’s criticisms and proposed improvements. Berkeley notes that the mathematicians of the age see themselves as having fully mastered and moved beyond the infinite. In the preview he summarises it as: ‘*Modern Analysts supposed by themselves to extend their views even beyond the infinity. Deluded by their own Species or Symbols.*’²³⁶ He notes that they see nothing mysterious in this, and asks if it is not the case that they are deluded by their own terms and are simply fooling themselves with empty signs and words with no meaning.

This criticism, especially from one who has endorsed the operational value of symbols that represent no clear idea (i.e. result of a square root operation when applied to a negative number, given as an example in *Alciphron* Dialogue 7, §14, and pre-empted in the discussion of counters in Dialogue 7, §5), is reminiscent of instances of deists/freethinkers using the same approach to challenge theism and its symbols and language. Pearce summarises Toland’s use of this kind of argument and the freethinker Alciphron’s use of derivative arguments in *Alciphron*:

[Alciphron’s] accusation is that among the central teachings of Christianity are to be found certain doctrines, the so-called ‘mysteries,’ which are really no more than “empty notions, or, so to speak more properly,... mere forms of speech, which mean nothing, and are of no use to mankind” (ALC §7.1) This accusation and the argument which follows, is drawn from John Toland’s notorious *Christianity Not Mysterious* (Toland 1696) Toland’s book begins with a lengthy account (without attribution) of Locke’s epistemology and philosophy of language, then proceeds to argue that, given these theories, no

²³⁶ In this section Jesseph notes the closeness of the language Berkeley uses to that of L’Hôpital and his characterisation of the achievements of the field in his introduction to *Analyse des infiniment petits*. (Berkeley & Jesseph, 1992, p. 168 footnote 3)

meaning can be assigned to the so-called ‘mysteries’ of the Christian faith. Toland defines a ‘mystery’ as “a thing in its own Nature inconceivable”. Because this thing is inconceivable, the words with which we confess our belief in the mystery are not associated with any ideas. (Pearce K. L., 2017, p. 134)

What are we to make of the following remark from Berkeley?

[N]otwithstanding all these Assertions and Pretensions, it may be justly questioned whether, as other Men in other Inquiries are often deceived by Words and Terms, so they likewise are not wonderfully deceived and deluded by their own peculiar Signs, Symbols, or Species.²³⁷ Nothing is easier than to devise Expressions or Notations, for Fluxions and Infinitesimals (...) These Expressions are indeed clear and distinct, and the Mind finds no difficulty in conceiving them to be continued beyond any assignable Bounds. But if we remove the Veil and look underneath, if laying aside the Expressions we set ourselves attentively to consider the things themselves, which are supposed to be expressed or marked thereby, we shall discover much Emptiness, Darkness, and Confusion.; nay if I mistake it not, direct Impossibilities and Contradictions. (*The Analyst*, §8)

Jesseph interprets this as demonstrating the difference between the standards Berkeley has for arithmetic (strongly nominalistic) and for geometry (where ‘Berkeley rejects the possibility of justifying it on purely nominalistic grounds and demands that the key terms be interpreted in a sense consistent with his reading of geometry as a science of extension’ (*The Analyst*, Jesseph’s Footnote 2)). He appeals to Queries 27, 41, 45, 46 in support of this reading. Before looking at those entries in the Queries, it is instructive to look at his discussion of symbols and ‘species’ in *Alciphron*, just two years earlier. This following discussion arises in the midst of Berkeley’s arguments against the idea theory of meaning. Specifically, he means the Lockean philosophy of language Toland made use of in *Christianity not Mysterious* (discussed in my second chapter and exemplified by the previous Pearce quote). He advises that this standard is not to be advised because of how

²³⁷ Definition of ‘species’ from *The New Universal Etymological English Dictionary* (1756) ‘SPECIES (among *Logicians*) is a common idea , under one more common and more general; as the *Parallelogram* and the *Trapezium* are species of the *Quadrilater*; and *Body* and *Mind* are species of *Substance*.’ (Bailey, 1756) Jesseph notes that ‘species’ is the early modern term for what we would now call a variable. This meaning is reflected in titles like *A New and Complete System of Algebra: Or, Specious Arithmetic* (Fenn, 1767).

inadequately it handles concepts that are of obvious use and value in all sorts of discipline:

Thus much, upon the whole, may be said of *all* signs: that they do not always suggest ideas signified to the mind (...) that they have other uses besides barely standing for and exhibiting ideas, such as raising proper emotions, producing certain dispositions or habits of mind and directing our actions in pursuit of that happiness which is the ultimate end and design (...): that the true end of speech, reason, science, faith, assent, in all its different degrees, is not merely, or principally, or always the imparting or acquiring of ideas, but rather something of an active, operative nature, tending to a conceived good; which may sometimes be obtained, not only although the ideas marked are not offered to the mind, but even although *there should be no possibility of offering or exhibiting any such idea to the mind*: for instance, the algebraic mark, which denotes the root of a negative square, has its use in logistic operations, although it be impossible to form an idea of any such quantity. And *what is true of algebraic signs, is also true of words or language*, modern algebra being in fact a more short, apposite, and artificial sort of language. (*Alciphron*, D7 §17, my italics)

Echoing parts of the *Principles Introduction*, Berkeley argues that the primary semantic role of words is not, per Lockean philosophy of language, the representing of an idea. When he argues against abstract general ideas in *PI* he says '[I]et us therefore examine the manner wherein Words have contributed to the Origin of that Mistake'. He outlines the fundamentals of the Lockean system, and criticises the failure to distinguish between definitions and idea-representations, claiming it is 'one thing for to keep a Name constantly to the same Definition, and another to make it stand every where for the same Idea: the one is necessary, the other useless and impracticable' (*PI*, §18). He then fully disavows the idea theory, challenging the 'received Opinion' that 'Language has no other End but the communicating our Ideas' (*PI*, §19). He puts forward his own view, which is an antecedent of the one outlined (over twenty year later) in *Alciphron*:

[T]he communicating of Ideas marked by Words is not the chief and only end of Language, as is commonly supposed. There are other Ends, as the raising of some Passion, the exciting to, or deterring from an Action, the putting the Mind in some particular Disposition; to which the former is in many Cases barely subservient, *and sometimes intirely omitted*, when these can be obtained without it, as I think doth not unfrequently happen (...).(*PI*, §20, my italics)

The *Alciphron* passage (second to last indented quote) shows that in his mature philosophy Berkeley thinks that to judge a term, or component of a system (qua sign) solely on the basis of whether it conforms to the Lockean ideal, is mistaken. In the *PI* it is possible to regard Berkeley as marginally closer to the Lockean system, since he is talking about a kind of semantical by-passing of idea-representation. In that case, words may have originally had meaning by virtue of ideas represented, but this component may be overcome in the sophisticated language user who no longer needs to swap symbols for ideas, the symbols having become nested in practice in a way that means the idea, though it may have been important in the acquisition of meaning and understanding, is later redundant.

In the *Alciphron* excerpt it is clear that Berkeley is perfectly comfortable with the thought that words and signs can have meaning and instrumental value without representing ideas, and even in cases where ‘there should be no possibility of offering or exhibiting any such idea to the mind’. And, he is clear to say that this is true all words: ‘what is true of algebraic signs, is also true of words or language.’ (*Alciphron*, D7 §17)

Thus, it should seem strange and unacceptable to the reader to see Berkeley, in *The Analyst*, criticising infinitesimals and fluxions on the basis of their failure to meet a criteria he has disavowed so generally and so recently.²³⁸ Particularly, since this is a case where he thinks the practice of applying calculus in mechanics and science is valuable, and works towards a good (in accordance with ‘something of an active, operative nature, tending to a conceived good’). The success in use is mentioned in *The Analyst* where he notes that the new mathematics has ‘enabled them so remarkably to outgo the Ancients in discovering Theorems and solving Problems’ (*The Analyst* §3). The success of calculus in application is also affirmed in the *Queries* and in *DFM*.

²³⁸ In their paper Mikhail Katz and David Sherry note this inconsistency, and use it (in conjunction with another point on Berkeley’s mathematical interpretation) to leverage a much deeper criticism of Berkeley’s position on the calculus: ‘We have dissected Berkeley’s critique into its component parts following Sherry, and have revealed the implausibility of some of the assumptions underlying that critique. We have discussed both the critique’s ill-informed nature, and Berkeley’s contradictory attitude when writing about a different field of mathematics, such as arithmetic.’ (Katz & Sherry, 2013, p. 615)

Further, it is referred to explicitly in *Alciphron* as a case where excessive focus on technicalities and semantics has led to disputes where it should be agreed by all that the usefulness outweighs the minute worries:²³⁹ '[L]abouring to obtain precise ideas which they suppose indiscriminately annexed to all the terms, they will be sure to embarrass themselves with difficulties and disputes. Such are those which have sprung up in geometry about the nature of the angle of contact, the doctrine of proportions, of indivisibles, *infinitesimals*, and divers other points; notwithstanding all which, that science is very rightly esteemed an excellent and useful one, and is really found to be so in many occasions of human life; wherein it governs and directs the actions (...)' (*Alciphron*, D7 §18). Indeed, it would be strange, except that he has been clear to say he is taking the privilege of a freethinker.

Moving to Jesseph's evidence for the claim that geometry is of a completely different kind from other mathematics and science, and that accordingly it would make sense for Berkeley to criticise calculus on grounds he has ruled out explicitly in the case of algebra (and on my reading, in general) in *Alciphron*. Jesseph appeals to the following sections of the Queries:

Whether because, in stating a general Case of pure Algebra, we are at full liberty to make a Character denote, either a positive or a negative Quantity, or nothing at all, we may therefore in a geometrical Case, limited by Hypotheses and Reasonings from particular Properties and Relations of Figures, claim the same License? (*The Analyst*, Q27)

Whether in the most general Reasonings about Equalities and Proportions, Men may not demonstrate as well as in Geometry?

²³⁹ In fact, in this moment Berkeley is reminiscent of Leibniz's response to Nieuwentyt's and Clüver's criticisms of the 'foreign' calculus in the *Acta Eruditorum*. Nieuwentyt's general criticism was that the German analysts had 'all, as far as I know, (...) rather made use of it than consciously demonstrated it.' (Nagel, 2008, p. 201) Leibniz, in a draft response emphasises the fact that he saw his calculus as a tool, and laments obsession with the foundations: 'When my calculus (...) had appeared and spread, certain over-precise veterans began to make trouble; (...) When then our method of infinitesimals, which has become known by the name of the calculus of differences, began to be spread abroad by several examples of its use, (...) just lately a certain erudite mathematician, writing under an assumed name in the scientific *Journal de Trevoux*, appeared to find fault with the this method. But to mention one of them by name, (...) Bernard Nieuwentijt, one indeed really well equipped both in learning and ability, but one who wished rather to become known by revising our methods to some extent than by advancing them' (Leibniz & Child, 1920, pp. 145-146).

Whether in such Demonstrations, they are not obliged to the same strict Reasonings as in Geometry? And whether such their Reasonings are not deduced from the same Axioms with those in Geometry? Whether therefore Algebra be not as truly a Science as Geometry? (*The Analyst*, Q41)

Whether, although Geometry be a Science, and Algebra allowed to be a Science, and the Analytical a most excellent Method, in the Application nevertheless of the Analysis to Geometry, Men may not have admitted false Principles and wrong Methods of Reasoning? (*The Analyst*, Q45)

Whether, although Algebraical Reasonings are admitted to be ever so just, when confined to Signs or Species as general Representatives of Quantity, you may not nevertheless fall into Error, if, when you limit them to stand for particular things, you do not limit your self to reason consistently with the Nature of such particular things? And whether such Error ought to be imputed to pure Algebra? (*The Analyst*, Q46)

I can see why Jesseph reads these fragments as justifying the idea that Berkeley thought the standards for meaning in geometry were a special case. And thus as legitimating the view that Berkeley was genuinely critical of the idea-representation aspect of infinitesimals, and that we should read *The Analyst* as evidence of both a move towards more traditional attitudes towards mathematics and a move away from *Alciphron* on meaning.

My own reading of these sections (discussed again in the section on the Queries) is as follows: what we have in the Queries is Berkeley discussing some of his own metaphysical objections to the mathematics of the time intermixed with some of the freethinking criticisms mentioned in the Body. Berkeley begins the Queries by lamenting the fact that mathematicians don't treat extension *as experienced* as the proper object of geometry. He believes they work with an idealisation (one postulating zero-dimensional points, and one-dimensional lines). They extrapolate from results proved in geometry to real world consequences—so, they pair an impossible form of geometric abstraction with a naïve realism about mathematical denotation. Given that they take this new geometry to reveal deep truths about the nature of the world (as is suggested by, among others, L'Hôpital and Keill) Berkeley thinks they should be exercising particular caution, *given their hypotheses and reasonings* (Q26)—particularly in attributing foundational status to the entities that are supposed to describe reality, given their commitments to the

idea theory and their belief that Euclidean geometry and its modernisations in analysis prove results that are true of the world.

The Mathematical Criticism: The Logical Argument and the Fallacy of Supposition

§9-11: §9 sees Berkeley move to ‘consider the Principles of this new Analysis’ in light of the ‘Error and false Reasoning’ it contains. He moves straight to a criticism of what we now call the Product Rule, which is a formula for the discovery of the derivatives of the products of functions. Suggesting that this is a fundamental point of the method of fluxions, he claims that this should mean that the analysts will be maximally clear on it, and so moves (for the remainder of §9, and up until §11) to demonstrate what he judges to be errors in Newton’s presentation.

He notes Newton’s claim in the Introduction to the Quadrature of Curves²⁴⁰ that, *in rebus mathematicis errores quàm minimi non sunt contemnendi*, or ‘for errors, tho’ never so small, are not to be neglected in Mathematicks.’²⁴¹ This is to flag the methodological rigour the mathematicians promise and advertise for their discipline, which he feels they fail to deliver. Berkeley claims Newton’s calculation is out by the difference of the product of the coefficients (ab), and calls Newton’s calculation an ‘illegitimate and indirect Method’: ‘getting rid of ab cannot be obtained by legitimate reasoning’.

Further, he derides the British mathematicians’ satisfaction at the idea that infinitesimals have been avoided in the fluxionary calculus. That they saw this a strength of the approach over the continental presentation was frequently addressed in the priority dispute by those advocating for Newton. In Berkeley’s

²⁴⁰ Perhaps these methodological and philosophical promises were what prompted his notebook entry: ‘Much Banter got from the prefaces of the Mathematicians’ (N386).

²⁴¹ This translation is from John Harris, *Lexicon Technicum* (1710).

opinion, their mathematics still requires an entity with properties no less problematic than those of the infinitesimal:

And indeed, though much Artifice hath been employ'd to escape or avoid the admission of Quantities infinitely small, yet it seems ineffectual. For ought I see, you can admit no Quantity as a Medium between a finite Quantity and nothing, without admitting Infinitesimals. (§11)

§12-16: Here, the discussion expands from the origins of the Product Rule to cover general computations of fluxions. Berkeley here conducts the majority of the criticism that has come to be known as the 'logical argument' (a term originating in Sherry (1987), upheld by Jesseph (1993), and recently disputed in Katz and Sherry (2013)). Berkeley begins by stating a lemma, the contents of which he takes all mathematicians to be committed to: a lemma against inter-equational value-equivocation:

"If with a View to demonstrate any Proposition, a certain Point is supposed, by virtue of which certain other Points are attained; and such supposed Point be it self afterwards destroyed or rejected by a contrary Supposition; in that case, all other Points, attained thereby and consequent thereupon, must also be destroyed and rejected, so as from thence forward to be no more supposed or applied in the Demonstration." This is so plain as to need no proof. (§12)

Here Berkeley is laying the groundwork for his eventual accusation of a fallacy of supposition (*fallacia suppositionis*). This is when a 'point' is supposed to have a positive value in order to achieve certain results (e.g. the generation of a tangent for a slope), and then the same entity is made equal to zero without impacting the previous calculations that implicitly defined it as non-zero, since otherwise it would be impossible to produce a slope. According to Berkeley, this is exactly what has taken place in the *Quadrature of Curves*. Having given a further example to show the illicit move more clearly he then moves to accusing the method of fluxions of relying on abuse of the above lemma, and commission of the attendant fallacy:

Nothing is plainer than that no just Conclusion can be directly drawn from two inconsistent Suppositions. You may indeed suppose anything possible: But afterwards you may not suppose any thing that destroys what you first supposed. Or if you do, you must begin *de novo*. (§15)

Hence, you are driven into the fallacious way of proceeding to a certain Point on the Supposition of an Increment, and then at once shifting your Supposition to that of no Increment. (...) (§16)

This argument is the one that has earned Berkeley the historical reputation of having discovered the problematic nature of the foundations of early calculus. In a new textbook, this example is given as illustrative of issues with realizations of the infinite and Berkeley is given credit for first noticing this obstacle. Øystein Linnebo gives this Berkeleyan case:

Such quantities seemed to play an important role in early versions of the calculus. For example, what is the rate of change of the function $f(x) = x^2$ at $x = a$? The answer used to be to add an infinitesimal δ to the argument and investigate how this affects the slope of the function:

$$\frac{(a + \delta)^2 - a^2}{(a + \delta) - a} = \frac{(a^2 + 2a\delta + \delta^2) - a^2}{\delta} = 2a + \delta = 2a$$

As Berkeley famously observed, however, this answer is problematic. In the first two terms of our calculation, we are assuming that $\delta \neq 0$; otherwise, we would make the blunder of dividing by zero. But the transition from the third to the fourth term appears to assume that $\delta = 0$. This apparent doublespeak prompted Berkeley to mock that the analysts' δ is "the ghost of a departed quantity." (Linnebo, 2017, p. 63)

It is also the argument most closely resembling those logical and conceptual challenges certain freethinkers applied to religious notions such as the Trinity.²⁴²

Berkeley and the Forebears of the Logical Argument

According to Guicciardini, 'the problem of foundations was never seriously treated before Berkeley.' (Guicciardini, 1999, p. 41) This is not the case, and obscures the fact that there was a tradition of relevant criticism, and that it was one of which Berkeley was aware. This obscurity encourages the view, which I think is mistaken, that Berkeley thought the main achievement of the work was the mathematical criticism it contained.

²⁴² This and other comparison cases are discussed in the final chapter.

Mancosu (1996) and Blay (1986) have both noted the similarity between Berkeley's logical argument and some arguments of his predecessors. Discussing what he terms the road to the 'victory of the Leibnizians' (Mancosu, *Philosophy of Mathematics and Mathematical Practice in the Seventeenth Century*, 1996, p. 177), Mancosu gives an outline of two significant disputes over the rigour of calculus that predate Berkeley's contributions. The first of the two took place in the *Acta Eruditorum* and featured Leibniz, Bernard Nieuwentyt, Dethleff Clüver, the Bernoullis and Jacob Hermann. The later, occupying the French academy, in the *Journal des sçavans* (later, the *Journal des savants*) and featuring an exchange between Michel Rolle and Joseph Saurin, a protégé of L'Hôpital.

In the earlier exchange in the *Acta Eruditorum* (of which the Berkeley family's book auction contained a full set), there were two principle antagonists: Dethleff Clüver and Bernard Nieuwentyt. Clüver's criticism of the Leibnizians appeared in the journal in 1687. According to Mancosu, little of Clüver's contribution to this exchange remains in print, though much of his other work on the quadrature of the parabola remains.²⁴³ He criticised the differential calculus along two principal lines: (1) the analysts postulate the existence of entities as small as one pleases, and (2) the joined assumptions that (a) infinite series have last terms, and (b) that an entity continually decreasing in size becomes a nothing/*nihil*. Clüver summarised his views on the method in a letter to Leibniz of 1694:

Allow me the freedom to express my opinion: I think that your method in the differential calculus is not sufficient to obtain the ultimate precision in Geometry. The source of every imperfection is that you take the ration between the unity and an infinite number to be equal to nothing, i.e. $1/N = 0$, which...is an impossible contradiction. (Quoted in Mancosu (1996, 158))

The Leibnizian response involves the notion of incomparability. So, it's not quite that the ratio is equal to zero, but rather incomparable quantities are 'not at all fixed or determined but can be taken to be as small as we wish in our geometrical

²⁴³ See Mancosu (1996, p. 157). Clüver's calculus criticism appeared in two papers: 'Monitum ad Geometras' published in the *Acta Eruditorum* in 1687 and an earlier paper 'Quadratura circuli infinitis modis demonstrate' of 1686. For more detailed discussion of Clüver and the Leibnizians, see Mancosu and Vailati (1990).

reasoning and so have the effect of the infinitely small in the rigorous sense'. (Horvath, 1986, p. 66).

Nieuwentyt's criticism is more detailed, and we know from Leibniz's correspondences that he was unsatisfied with Leibniz's initial response to his concerns. Leibniz didn't respond a second time, being aware that Jacob Hermann had for a considerable time been working on a piece to that effect on his behalf. Nieuwentyt is an interesting figure in Berkeley's history; he is mentioned a number of times in Berkeley's early philosophy. Berkeley refers to him by name in 'Of Infinites', and refers to what can only be his work (in the *Acta Eruditorum*) in the *Principles*, when he notes that there are rival interpretations of infinitesimals. A number of the earliest mentions of infinitesimals in the notebooks also lead one to believe that he may have had Nieuwentyt in mind (and this is very plausible since they are dated as belonging to the same period as 'Of Infinites').

The not Leading men into mistakes no argument for the truth of the infinitesimals, they being nothings may, perhaps, do neither good nor harm, except when they are taken for some thing: & then the contradiction begets a Contradiction. (N337)

Much less infinitesimals of infinitesimals &c. (N355)

Nieuwentyt's two most significant contributions to philosophy (according to E. W. Beth) are his calculus interactions, and his treatise *The Religious Philosopher, or, The Right Use of Contemplating the Works of the Creator* (Nieuwentyt, 1718).²⁴⁴ In *The Religious Philosopher*, Nieuwentyt describes his goal in that text as in pursuit of two objectives: to convince (1) 'Atheists of the Wisdom, Power and Goodness of God, the Maker and Ruler of all Things', (2) 'Infidels (who indeed acknowledge a God, but reject the Authority of the Holy Writings) that the Scriptures are of a more than Humane Original; and so to represent to both of 'em the right use of the Contemplation of the World.' (Nieuwentyt, 1718, pp. Vol 1, p.i.) Thus, it is interesting to note that he was also writing against infidels and deists in the period just before Berkeley. Further, he saw, as Berkeley did, the risk to religion posed by insufficiently nuanced interpretations of new Enlightenment science.

²⁴⁴ *The Religious Philosopher* was first published, in Dutch, in 1715.

Nieuwentyt's criticism of the calculus strongly anticipates Berkeley's,²⁴⁵ and it is important to note that Berkeley's discourse of the 'disputes' of current geometers (*Principles*, §130) demonstrates that he was familiar with it and at that stage saw it as evidence against the coherence of the introduction of transfinite or infinitesimal entities in mathematics:

Some there are of great Note, who not content with holding that finite Lines may be divided into an infinite Number of Parts, do yet farther maintain, that each of those Infinitesimals is it self subdivisible into an Infinity of other Parts or Infinitesimals of a second Order, and so on *ad infinitum*. These, I say, assert there are Infinitesimals of Infinitesimals of Infinitesimals, without ever coming to an end. (...) Others there be who hold all Orders of Infinitesimals below the first to be nothing at all, thinking it with good reason absurd, to imagine there is any positive Quantity or Part of Extension, which though multiplied infinitely, can never equal the smallest given Extension. (*Principles*, §130)

Thus, in the *Principles*, Berkeley was aware of Nieuwentyt's objections to the Leibnizian calculus. Mancosu, who is particularly interested in the correspondences between Berkeley's criticisms and those of Michel Rolle, has suggested that there is work to be done here, saying: 'Several questions could be asked about the relationship between the early criticisms of the infinitesimal calculus (of Rolle, Nieuwentijt, Clüver, etc.) and the later criticisms.' Mancosu then goes on to point out that Rolle provided the two main lines of criticism Berkeley is now known for over twenty years earlier. Maintaining Sherry's distinction between 'the metaphysical criticism' and 'the logical criticism', Mancosu notes that both are in Rolle:

It is quite interesting to find that Rolle's three main objections are raised in the *Analyst*. In particular, paragraphs 6 and 7 of the *Analyst* contain a critique of the existence and conceivability of differentials, and paragraph 18 contains an attack on the use of dx both as a quantity and as an absolute zero. (Mancosu, 1996, p. 177)

There is no explicit evidence that Berkeley had read Rolle, but he would have had access to the *Journal des scavans*.²⁴⁶

²⁴⁵ Niccolò Guicciardini makes the same observation very briefly in Guicciardini (1999, p. 199), but the comparison is not pursued.

²⁴⁶ I am grateful to Sue Hemmens, in Dublin's Marsh Library. She advises me that three of the collections that would have been available to Berkeley (the Bouhereau, Stillingfleet and Marsh collections) contained issues of the *Journal de Scavans*.

So, to the detail of Nieuwentyt's claim: his writings on the infinitesimal calculus all appear between 1694 and 1696, but his interest in the subject arose when he was moved to write an elementary treatise on it, prompted by a need to teach it to his stepson. The resulting text, *Analysis Infinitorum*, which he describes as a 'little work, written by a beginner for beginners' (Nieuwentijt, 1695), was the first instructive book on integral calculus—de L'Hôpital's *Analyses des infiniment petits* only treated differentiation. Interestingly, Nieuwentyt's initial work is based primarily on the work of the British mathematicians Barrow, Wallis and Newton, and he saw himself as providing rigorous demonstrations of what other mathematicians—particularly Barrow—had offered without proof. The first, and methodologically dominant, axiom in his system was as follows:

'[A]nything that, if multiplied by an infinite quantity, does not produce a given [finite] quantity, however small, cannot be reckoned among the beings, and must in geometry be counted as zero. (*Analysis Infinitorum*, 2, quoted in Vermij (1989, p. 71))

Thus, we can see that second order infinitesimals are going to be a problem for Nieuwentyt. If he considers an infinitesimal to be an infinitesimal part of a finite quantity, we can express an infinitesimal as a/b where b is infinity. The product of two entities of this a/b expression type will yield a b^2 denominator. This new expression, when multiplied by an infinite, will still not produce a finite quantity and per the axiom, it must be considered a zero. However, the system works well when restricted to first-order infinitesimal problems.

In 1694, Nieuwentyt discovered that Leibniz had been working on similar mathematics. In a later book, *Considerationes*, he mentions discovering Leibniz's work (but notes that his own deduction is from more primitive mathematics), and uses one of Leibniz's results as an example in his workings. His second mention of Leibniz in *Considerationes* makes reference to his puzzlement that the latter is making use of higher-order infinitesimals, since these 'successions of differentiations' cannot exist in his system.

Nieuwentyt wrote to Leibniz, who reported the receipt and nature of the criticisms in a letter to Huygens. His response to the issue of higher order infinitesimals, as conveyed to Huygens, was simply: 'It is easy to answer him that the square has to be multiplied by an infinite number of the second degree, as it is

infinitely small of the second degree; that is to say, by an infinite number multiplied by itself.' (Vermij 1989, 77)

Nieuwentyt's and Leibniz's differences of opinion boil down to a deep disagreement about the nature of the continuum, where, though almost all considered him the victor in this dispute, it must be noted that Leibniz has some quite unusual ideas about measure and equality.²⁴⁷ That first axiom of Nieuwentyt's system expresses what was for him a deeply intuitive truth: there is just one infinite number, and though it may be operated on, we may not produce what would be for him further parasitic infinities. To summarise this exchange, Nieuwentyt argued for what are now called nil-square infinitesimals (whereby $(dx)^2 = 0$, if dx is infinitesimal), whereas given Leibniz's notion of the 'labyrinth of the continuum', he is committed to infinitesimals of at least an infinity of orders (where, if dx is infinitesimal $dx^n \neq 0$ for all and any n).²⁴⁸

However, more importantly for my purposes, Nieuwentyt also criticises Leibniz (and Barrow and Newton) on the basis of the treatment of the infinitely small quantities as *equivalent to zero*. In Nieuwentyt's hands, this ends up coming very close to Berkeley's logical problem argument. Nieuwentyt's understanding of infinitesimals is geometric, and so for him an infinitesimal must have the smallest possible measure. The problem with equating the infinitesimal to zero is that the whole point of adding an infinitesimal to the calculus calculations is to introduce a difference, Δ , to derive a rate. The objection that this difference cannot be equal to zero (no difference) is very close to Berkeley's best-known calculus objection, and we have good reason to believe that Nieuwentyt was an uncredited source of Berkeley's argument in *The Analyst*. Berkeley certainly rearticulates this equivocation in a more logically powerful way, using the backdrop of the aforementioned lemma, and powerful rhetoric to the effect that different and

²⁴⁷ Nieuwentyt, one might think rather naturally, holds that two quantities are equal to one another only if their difference is zero. Leibniz, however, takes it that, though two quantities are equal when their difference is zero, they are also equal when their difference is incomparably small with respect to the quantities under comparison.

²⁴⁸ Nilpotent squares have returned in contemporary smooth infinitesimal analysis (see Bell (1940)). There are important differences between how Nieuwentyt and Bell would have understood number theory, but the correspondences between Bell's method and Nieuwentyt's earlier theory are significant and worth noting.

indeed opposing suppositions are being used to define a singular entity in the course of one set of operations. Further, Berkeley was still evidently reading Nieuwentyt in his later work. Berkeley mentions Nieuwentyt by name in *Siris* in 1744 in his discussion of the principle of sulphur, fire and light in §190, and then discusses his experimental results and related views on fire in §196.

Cursory treatment of Nieuwentyt's significance may be explained by his great mathematical vindication only arriving in the 1990s, in the shape a consistent theory of nilpotent infinitesimals in Bell's "Smooth Infinitesimal Analysis". It is noteworthy that, though in *Principles* §130, the two camps (advocating nilpotent and potent squares, variously) are treated very much as equals (with Berkeley feeling the need to argue against Nieuwentyt's position as well as Leibniz's), by the time of *The Analyst*, Berkeley sees no real need to challenge the rival conception.²⁴⁹ In this new 1990s mathematics, derived from completely separate origins to Robinson's nonstandard analysis (Robinson's theory emerges from logical developments, Bell's from category theory), Nieuwentyt's conception of infinitesimals is shown to be perfectly rigorous. Bell, describing his purpose in devising the system:

My purpose in writing this book has been to show how the traditional infinitesimal methods of mathematical analysis can be brought up to date – restored, so to speak – allowing their beauty and utility to be revealed anew. (Bell J. L., 2008, p. ix)

It remains to be seen whether it would be possible to construct a modern casting of an analytic system preserving some of the empiricist criteria outlined by Berkeley in the notebooks, 'Of Infinites', and the *Principles*.²⁵⁰ For the purposes of the critical

²⁴⁹ He argues as follows: 'Others there be who hold all Orders of Infinitesimals below the first to be nothing at all, thinking it with good reason absurd, to imagine there is any positive Quantity or Part of Extension, which though multiplied infinitely, can ever equal the smallest given Extension. And yet on the other hand it seems no less absurd, to think the Square, Cube, or other Power of a positive real Root, should it self be nothing at all; which they who hold Infinitesimals of the first Order, denying all of the subsequent Orders, are obliged to maintain.' (*Principles*, §130)

²⁵⁰ In conversation, Paolo Mancosu has said the project represents an exciting prospect. The obvious considerations may involve thinking about what the expressive benefits and limitations would be of such a system. A geometry of non-punctiform minima conforming to the experience of a perceiver would have obvious disadvantages, like perceptual dependency (though, this obviously wouldn't be seen by Berkeley as any

summary it is important to note that, mathematically speaking, there is little new in Berkeley's arguments—this seems particularly true relative to Rolle's work, and especially interesting given the likelihood of Berkeley's access to it.²⁵¹ The certainty over Berkeley's access to Nieuwentyt's, and his frequent references to him, makes discussion of Nieuwentyt easier. Undoubtedly, Berkeley gives the rigour arguments a more forceful presentation than his predecessors, and he has certainly become the person most strongly associated with this logical equivocation line of argument. However, Berkeley's arguments are similar to arguments he was familiar with from his youth, and it is reasonable to believe that even he didn't see them as deeply original. The rhetorical power of his hyperbole, facilitated by his freethinking-standpoint makes sense of the fact that they have garnered so much historical attention. Indeed, it's rare that the phrase 'ghosts of departed quantities' isn't raised in introductory discussions of the rigour worries over the early calculus.

kind of negative). One could also expect a loss of generality. Berkeley thought one advantage of such a system would be the elimination of incommensurable surds, since, relative to a user, there just is some number of minima that constitute any line or area (and this would remain true for the diagonal of a unitary square, for example).

²⁵¹ One interesting point of contact was that Malebranche was considered decisive in the termination of the 'polemic provoked by Michel Rolle' in the Académie des Sciences. Malebranche was seen as central to the mathematical world of late 17th century and early 18th century France: '[T]he history of mathematics at the end of the seventeenth century—at least in France—cannot be described without referring to his activity. (...) Malebranche successively insisted on the need for reform and fostered the introduction of Leibnizian mathematics.' (Costabel, 2017) Given Berkeley's interest in Malebranche in this period (1706, the year of the end of the Académie des Sciences infighting, was the year Berkeley began writing the notebooks, and his occupation with Malebranche's ideas in those writings is well-documented), it is at least possible that his awareness of Malebranche's activism around infinitesimal methods may have made him aware of the arguments of his objectors. Two of Berkeley's letters from Paris (on the 24th and 25th November, 1713) record Berkeley's plan to meet with Fr Malebranche (in the letter of the 24th the meeting is to take place the same day and in that of the 25th the meeting is described as happening the following day). It's not clear the meeting ever took place. Stoneham notes that Stock claimed it did indeed take place and that it was 'so heated that it led to Malebranche's death' (Stoneham T. , 2002, p. 8), but points to the fact that Stock's dating of things makes the meeting, as he described it, impossible. Stock is also unreliable on other points.

*Further Arguments: Similarity of British and Continental
Approaches, and Illogicality of Methods*

§17-20: In §17 and §18, Berkeley draws attention to Newton's various presentations of the fundamentals of the calculus, claiming that (contra Newtonians—particularly John Keill) there is no salient difference between evanescent increments and infinitesimal differences. He claims that no geometrical quantity can be 'exhausted' to nothing in the way that the Newtonian calculus suggests. As such, the Newtonians do no better than the continental mathematicians who, rather than giving a piece of notation to denote these contradictory properties, just postulate an object with these as its defining qualities. Interestingly, at this point in the discussion, Jesseph notes a tension between the viewpoint in the *Body*, and that of the *Queries*. Jesseph: 'Here, Berkeley comes close to endorsing the thesis of infinite divisibility, which he elsewhere denies (*cf.* *Queries* 5, 6, 18 and 52).' (Berkeley & Jesseph, *The Analyst*, 1992, pp. 178, note 10) This idea—that Berkeley is arguing from a different point of view—is fundamental to my reading and it is interesting to see this element of it noticed by Jesseph in his reading.

At the end of §17 Berkeley refers to the 'Followers' of the author of the method, and criticises them for failing to scrutinise the foundations, being 'themselves more eager in applying his Method, than accurate in examining its Principles.'²⁵² The 'author' is Newton, and by 'Followers' he means those that follow him with the sort of fervour that Berkeley sees the freethinkers as criticising when they attack religious faith in believers. Berkeley thinks faith is vital in religion. In 'A Sermon Preached before the Incorporated Society', faith and particularly 'humility of faith' is emphasised as being an important ingredient in the kind of 'holy practical knowledge' he advocates. But the freethinker is supposed to scorn faith, as a

²⁵² This is reminiscent of Nieuwentyt's desire that the logical foundations (particularly the status of higher order infinitesimals) be made more secure, and better philosophically motivated. Nieuwentyt thought Leibniz, the Bernoullis, Hermann etc were too eager to continue extending the method to give proper and repeated attention to criticism of the foundations by himself and Dethlef Clüver.

hangover from a pre-enlightened time, or make rationality demands on faith, that mean it is dependent on knowledge in some way. For example, Toland in *Christianity not Mysterious*:

‘But ‘tis affirmed, that God *has a right to require the Assent of his Creatures to what they cannot comprehend*; (...) Is it possible for us to understand those *Mysteries* at last, or not? (...) if it be impossible after all to understand them, this is such a piece of Folly and Impertinence as no sober Man would be guilty of, to puzzle People’s Heads with what they could never conceive, to exhort to, and command the Study of them; and all this to keep ‘em from Idleness, when they can scarce find leisure enough for what is on all hands granted to be intelligible. (Toland, 1696, pp. 137-138)

§19 & §20: In §19 Berkeley suggests that the analysts let their conclusions (which seem true) justify their method, where, historically the rigour (and thus, justification) of mathematics has been seen to derive from the robustness of deductive derivation from agreed axioms. This represents a departure from previous mathematics (since the justification is now inductive rather than deductive), and Berkeley suggests it shows analysis to be of a different kind from previous mathematics. This development, he says, should deprive them of their status as the custodians of reason: ‘And if you submit to this, your Authority will no longer lead the way in Points of Reason and Science.’

In §20, Berkeley criticises the analysts for failing to provide a rigorous logic and method to secure the rigour of the calculus, while acknowledging the correctness/success of its conclusions (with which he has ‘no controversy’). Again, there is a sense in which this is in tension with his account of the same phenomenon in *Alciphron*. Euphranor’s position frequently undermines those who fail to see that the practical benefits of a discipline bear importantly on how we should view its method. We might think there is something special in the nature of mathematics, that means that it should be more rigorous, or more methodological than other disciplines (even if he’s described things in broad strokes in *Alciphron*), but he is within his right to draw attention to the fact that mathematicians claim methodological purity, and under a freethinker’s analysis, fail to achieve it.

Berkeley's Compensation of Errors Attempt at Redescribing the Method

§21-29: In these middle sections, Berkeley moves to his proposed improvement of the explanation of the method underlying the results, which he acknowledges are true. According to him, the main issue is as follows: *'By virtue of a twofold mistake Analysts arrive at Truth, but not at Science: ignorant how they come at their own Conclusions.'* (*The Analyst*, Preview of §22)

This 'twofold mistake' occurs in the form of compensating errors that arise in the computations. In the example he chooses, there are two erroneous calculations in the procedure of calculating the subtangent—joining the ordinate and tangent to a parabola. Berkeley thinks an error was made in the equation for the subtangent which should have had an additional term (z) in the divisor, so, there is an error of omission in this instance. He claims there is an additional positive error in the equation of the curve, this time including a measure that ought not to be there, measure z . Therefore, according to Berkeley, 'the two errors being equal and contrary destroy each other; the first error of defect being corrected by a second error of excess.' It should be noted that Berkeley offers this as a cure-all (and a way to replace troublesome aspects of the new mathematics with classical conical sections theory), and provides a second example using an infinitesimal that is introduced and compensated (§24), but, provides little by way of a general program for doing so. This section ends with Berkeley claiming that a balancing of errors can be found in all true cases:

Therefore, be the Power what you please, there will arise on one Side [of the equation] an algebraical Expression, on the other a geometrical Quantity (...). This hint may, perhaps, be further extended and applied to good purpose, by those who have leisure and curiosity for such Matters. (§29)

This project might be thought to represent a challenge for my interpretation. If, as I suggest, Berkeley is ultimately at peace with the technical challenges represented by the calculus, because its legitimacy is vindicated by its success in application, why should he provide his own account of what's going on? Jesseph, who reads *The*

Analyst as an indication of Berkeley's greatly changed views on mathematics, rather than an exercise in pointed public ad hominem, sees this as evidence of Berkeley's need to provide a robust methodology for a set of results he acknowledges are true.

Jesseph:

Berkeley announces that he is not challenging the truth of any theorems in the calculus but only the manner of their demonstration (...). But accepting the results of the calculus while objecting to the reasoning which leads to these results requires Berkeley to explain how correct results can be obtained by flawed reasoning. (Jesseph D. , 1993, pp. 199-200)

It should be clear, however, that he considers this a necessary project, since he regards the theorems as true but the methods as flawed. (Jesseph D. , 1993, p. 204)

The results-focused approach of *Alciphron* might make it seem that he has no need to provide such an account for a mathematics that has obviously demonstrated its usefulness in its applications to the science of his day. Further, on my view, he's not even sincerely committed to his criticism of the method of demonstration itself. However, there is still a puzzle here for Berkeley, one that provides interest in its own right, as well as potentially to his readers. An additional interpretation available within my reading of this section of *The Analyst* (and the endeavour in general) is that Berkeley, like the freethinkers whose privilege he has claimed in the *Body*, is looking to provide his own account of how the analysts should see the foundations of their discipline. There are many freethinking examples (examples Berkeley refers to explicitly in the *Guardian* and *Alciphron*) that take this approach to Christianity. In fact, Berkeley's 'freethinker' moniker can be seen to comprise equally those who actually lean towards and encourage atheism, and those who merely suggest some (often deistic) reforms to doctrine.

Berkeley tended to see the naturalising of faith and religion as a sure way to eventually destroy it. Toland's *Christianity not Mysterious* is an excellent example of the kind of reform project Berkeley would have considered ultimately fatal to religion. By attempting to reformulate the Gospels along non-mysterious, naturalist lines, Berkeley thought Toland ignored the benefits of the stability of orthodoxy in matters of belief. Consider the subtitle: *Christianity not Mysterious, or a Treatise*

Shewing That There is Nothing in the Gospel Contrary to Reason, Nor above it, And that no Christian Doctrine can be Properly Call'd a Mystery.

Toland claimed that mysteries were an example of “priestcraft” whereby the priests created the mysteries in order to ‘secure their privileged position in society as the sole interpreters of God’s words.’ (Wigelsworth, 2009, p. 21) Berkeley’s mathematical reconstruction may be a symptom of a desire to show that there may be better ways to secure the results, but it is also in keeping with what he would have seen as a freethinking inclination to try and improve from the outside what, from the point of view of insiders, was working just fine. It’s also possible that Berkeley thinks he has found a clever solution, and wants to show his brilliance. I don’t see either as inconsistent with my strong *ad hominem* reading.

Dispelling Previous Critical Responses

§30-47: Berkeley assesses and attempts to dispose of alternative and additional presentations of the calculus. His arguments are continuations of those launched in the previous sections, and are not vital to my interpretation, since they just redress more conservative theories. However, there are a number of moments which prompt discussion.

One point of interest, picked up by Jesseph in his edited version, is ‘Berkeley’s insistence here [§33] upon the necessity of comprehending the fundamental principles of the calculus undercuts interpretations which portray him as an instrumentalist in the philosophy of mathematics’ (*The Analyst*, Jesseph’s Footnote 28). The comments prompting this assessment are the following:²⁵³

And therefore you will perhaps maintain, that Problems will be solved without those inconceivable Suppositions: and that, consequently, the Doctrine of Fluxions, as to the practical Part, stands clear of all such Difficulties. I answer, that if in the use or application of this Method,

²⁵³ I have quoted from a little further back than Jesseph places his footnote, largely because the sentence that prompts the thought for him is hard to parse in isolation from the preceding ones.

those difficult and obscure Points are not attended to, they are nevertheless supposed. (...) Although the Rules may be practised by Men who neither attend to, nor perhaps know the Principles. In like manner, therefore, as a Sailor may practically apply certain Rules derived from Astronomy and Geometry, the Principles thereof he doth not understand. (...) You may operate and compute and solve Problems thereby, not only without an actual Attention to, or an actual Knowledge of, the Grounds of that Method, and the Principles whereon it depends, and whence it is deduced, but even without having ever considered or comprehended them. (§32)

But then it must be remembered, that in such Case although you may pass for an Artist, Computist, or Analyst, yet you may not be justly esteemed a Man of Science and Demonstration. (...) (§ 33)

This is in stark contrast with the pragmatist positions advocated in *Alciphron* and the scientific instrumentalism of De Motu,²⁵⁴ and if this was just Berkeley speaking about mathematics (rather than, as I believe, Berkeley playing a freethinking agitator for rhetorical reasons), Jesseph would be quite right in saying it troubles the possibility that he can be the instrumentalist and pragmatist others have thought he is. Indeed, in assessing Baum's 'The Instrumentalist and Formalist Elements of Berkeley's Philosophy of Mathematics', Jesseph uses this to discredit that interpretation:

Baum (1972) has argued for an instrumentalist and formalistic interpretation of Berkeley's philosophy of mathematics, but has overlooked *The Analyst*. (*The Analyst*, Jesseph's Footnote 28)

Baum uses a variety of sources to argue for Berkeley's instrumentalism—including the sections on meaning in Dialogue VII, and the discussion of language in Dialogue IV in *Alciphron*:

Berkeley presented the most original and important element of his theory of meaning in *Alciphron*, where he was attempting to defend and explain the meaningfulness of terms such as 'grace', against criticism by some Newtonians to the effect that since there are no ideas which could possibly serve as significates for such words, it follows that they must be meaningless. Berkeley did not hesitate to

²⁵⁴ For discussion of Berkeley's scientific instrumentalism, see Downing (2005), Newton-Smith (1985) and Buchdahl (1969).

admit that these religious terms had no denotata whatsoever, but he proceeded immediately to claim that there are many similar words, even in the physicists' own vocabulary, which are nevertheless meaningful despite their lack of denotata. And their meaning is associated with their use, if it is not one and the same with it! (Baum, 1972, pp. 124-125)

Baum also emphasises Berkeley's emphasis on a criteria of truth along the following lines: '[A] proposition is 'true' in so far as it is useful in achieving pre-determined ends.' (Baum, 1972, p. 126) The evidence cited for this claim is in *Alciphron* (D7 §8) and the *Principles*:

In the ordinary Affairs of Life, any Phrases may be retained, so long as they excite in us the proper Sentiments, or Dispositions to act in such a manner as is necessary for our well-being, how false soever they may be, if taken in a strict and speculative Sense. (*Principles*, §52)

The message seems clear: when usefulness and well-being are in tension with formal or speculative coherence, the former are to take precedence.

That Jesseph sees the main weakness of Baum's account, at least in its handling of Berkeley's philosophy of mathematics, to be his failing to take sufficient account of what seem like dramatic changes of position in *The Analyst*, is I think more evidence that *The Analyst* (especially the Body) is a real outlier in its pronouncements on meaning and mathematics. It may be less that Baum hasn't read *The Analyst*, but that Jesseph has undervalued *Alciphron* and Berkeley's more sustained views on use vs theory from the *Principles* on.

Conclusion of the Body

§48-49: These are the concluding remarks of the Body, in which Berkeley summarises a number of the features he has found to be lacking in the calculus. In §48 and §49 we see a number of the tenets that I have argued are in stark contrast with the positions advocated in *Alciphron*: complaints about inability to conceive of clear and distinct ideas and the fact that the theory's use in application doesn't rescue calculus from its problematic status. Either, *The Analyst* represents a

dramatic change of outlook in Berkeley's philosophy less than two years after he published *Alciphron, or, The Analyst* makes good on its promissory note, and represents Berkeley tackling the reputation of modern mathematics from the perspective of those who 'minutely' criticise religion.

§50: In §50, Berkeley is back speaking from his own point of view and reflecting on the project just undertaken. According to Berkeley's own lights, *The Analyst* was further provoked by a call to clarify his mathematical statements in earlier work (the *Principles*):

And though of late I have been called upon to make good my Suggestions; yet, as the Person who made this Call, doth not appear to think maturely enough to understand, either those Metaphysics which he would refute, or Mathematics which he would patronize, I should have spared myself the trouble of writing for his Conviction. (§50)

Luce believed this to be a reference to Andrew Baxter's criticism of the *Principles* and its various remarks on mathematics.²⁵⁵ Baxter had summarily criticised the metaphysical views set out by Berkeley in the *Principles*, especially on the grounds that they would cause problems for the traditional conception of mathematics. In a section titled 'Dean Berkeley's Scheme Examin'd', he addresses the major points of Berkeley's philosophy. Summarising the whole philosophical endeavour he says:

Some men deny all *immaterial*, and others all *material* substance; so that between them they leave *nothing at all* existing in nature. These two opposite *parties* help to expose each other; and it is hard to say, every thing considered, whose share is the greatest in the absurdity of *expunging all Being out of existence*. (...) [I]f it not be carrying an ungentle sort of *banter* too far, one cannot tell what to think of it. (Baxter, 1733, pp. 256 and 259-260)

Additionally, Baxter is dismissive and derisive of Berkeley's feeling that his system is anti-sceptical, and in service of epistemic confidence:

[S]ince Dean *Berkeley's* argument demonstrates all substance out of existence, equally with material substance; what small reason he had to proclaim (Sect. 93. of his Book) his victory over *Atheists* and *Sceptics*. (...) This is, I think, as if one should advance, that the best way for a woman to silence those, who may attack her reputation, is to turn a common prostitute. (...) We might with equal reason affirm, I think,

²⁵⁵ The timing of Baxter's criticism of Berkeley in his *Enquiry into the Nature of the Human Soul* (Baxter, 1733) makes it a suitable candidate.

that putting out the eyes is *the best cure* for dimness of sight. (Baxter, 1733, p. 284 and 286)

And finally, considering what he took to be Berkeley's position on mathematics, Baxter compares the respectability of the two endeavours:

We may farther observe that it doth not great honour to his new scheme, nor those who pretend to admire it, that it forces the author to suspect, that even Mathematicks may not be very sound knowledge at the bottom. (...) A man ought to have a vast deal of merit, and to have obliged the world with surprising discoveries, to justify his attacking these sciences at this rate; or rather no merit possible can warrant it. (Baxter, 1733, p. 298)

There is plenty here to convey why Berkeley might feel incensed and provoked. Berkeley is careful to differentiate between Baxter and the general addressee(s) of *The Analyst*. It may be that Berkeley had for some time recognised the opportunity for a 'parity of reasoning' style, freethinking-focused criticism of calculus, to serve the ends of showing the unfair level of scrutiny religion was being subjected to by those who failed to scrutinise the disciplines they avowed similarly. Perhaps Baxter's (1733) mishandling of his own philosophy along these lines simply pushed him over the edge and he undertook to write it then.

As I have suggested, Berkeley was aware of the availability of the pre-existing calculus criticisms (as evidenced by his familiarity with Nieuwentyt and his probable ownership of the full set of documents in which the exchanges between Nieuwentyt, Clüver, Leibniz, Hermann and the Bernoullis took place), but was concerned with work he thought more important than this 'minute' subject. It's clear that Berkeley was preoccupied with the Bermuda project, production and delivery of sermons, the normal business of his job in the church, and *Alciphron*—all projects prompted by or related to Berkeley's great worry about the future of European morality given the increasing reach of deism.²⁵⁶ But, having been thus provoked, he has conceded to the need for this project:

²⁵⁶ Just how keen his sense was that freethinking represented a kind of existential threat is on show in detail in *An Essay towards preventing the Ruin of Great Britain* in 1721. 'In order to promote that laudable design of effacing all religion from among us, they form themselves into assemblies, and proceed with united counsels and endeavours; with what success, and with what merit towards the public, the effect too plainly shews. I

Of a long time I have suspected, that these modern Analytics were not scientific, and gave some Hints thereof to the public about twenty five years ago. Since which time, I have been diverted by other Occupations, and imagined I might employ my self better than in deducing and laying together my Thoughts on so nice a subject. (§50)

There is some disdain for the project on show in this passage, especially when it is compared to the other valuable projects he sees himself as having been involved in recently—hence, Berkeley’s reference to this as a ‘nice’ project.²⁵⁷ To emphasise his feelings about the preoccupation with ‘nice’ subjects, and ‘nice’ approaches to important subjects in this period, note this excerpt from his ‘Sermon Preached before the Incorporated Society for the Propagation of the Gospel in Foreign Parts’ (1731):

The Christian Religion was calculated for the Bulk of Mankind, and therefore cannot reasonably be supposed to consist in subtle and nice Notions. From the time that Divinity was considered as a Science, and human Reason enthroned in the Sanctuary of God, the Hearts of its Professors seem to have been less under the Influence of Grace. (*SIS*, 250)

In the closing remarks of §50, Berkeley introduces the Queries, explaining that if the reader wishes to know what he takes the metaphysical issues underlying these technical problems to be, they may read on and ‘more clearly Comprehend’.

4.3

will not say these gentlemen have formed a direct design to ruin their country, or that they have the sense to see half the ill consequences which must necessarily flow from the spreading of their opinions; but the nation feels them, and it is high time the legislature put a stop to them. (...) [T]he finger of God will unravel all our vain projects, and make them snares to draw us into greater calamities, if we do not reform this scandalous libertinism which (whatever some shallow men may think) is our worst symptom, and the surest prognostic of our ruin’ (*Ruin GB*, 70-71).

²⁵⁷ In Johnson’s *A Dictionary of the English Language, Volume 1*, ‘nice’ is defined as ‘superfluously exact: it is often used to express a culpable delicacy; delicate; scrupulously and minutely cautious; fastidious; squeamish; easily injured (...); trifling; toying; wonton; trivial (...).’ A sense of Berkeley’s typical use of the word ‘nice’ comes from this excerpt from the *Principles*: ‘[C]an there be a nicer Strain of Abstraction than to distinguish the Existence of sensible Objects from their being perceived, so as to conceive them Existing unperceived?’ (*Principles*, §5)

The Queries

In this section, I outline some of the correspondences between the content of the Queries and the earlier anti-mathematicism, and Berkeley's sense that mathematics has gone the wrong way, metaphysically speaking. My reading of the Queries is that, in them, Berkeley offers some of the metaphysical reasons (rooted in a reaction to the theory of practicing mathematicians) that the calculus has the rigour problems it does. I think the Body represents a 'nice', freethinking account of the technical problems—one Berkeley's pragmatic shift can only allow him to conduct from the point of view of his philosophical opponents: the minute philosophers. The content of the Queries is closer to Berkeley's own philosophical views about the problems in the contemporary philosophy of mathematics. The important thing to note is that, ultimately, the pragmatism espoused in *Alciphron* should encourage us to think that Berkeley is ultimately at peace with calculus as practiced. Its usefulness and success in application are well-known, and confirmed by Berkeley as such. He is, however, upset by people who hold up mathematical method as the height of rigour, and oppose religion on the grounds that it has concepts that are difficult to accommodate given certain views on meaning and logic.

Thus, the Queries represent Berkeley briefly gesturing at the philosophical reasons the current theory is unrigorous—since, even if he is no longer preoccupied by this kind of 'nice' issue, he has opinions on what the underlying causes are. The query format, discussed in the last chapter, represents an interesting interpretive challenge, since it might be natural to think there are worries involved in extracting positive attitudes and views from content delivered in a questioning format. In the Queries to *The Analyst* I find the case to be much the same as in *The Querist*; the queries clearly represent views we know Berkeley to be committed to, and the natural reading is that they are used by him as a vehicle to convey his thoughts in a pointed fashion without making a positive, structured argumentative case. I summarise the central ideas, using particular queries as evidence, focusing on the

continuity in his philosophy on the issues of 1) anti-mathematicism, 2) the object of geometry and 3) infinite divisibility.²⁵⁸

Anti-Mathematicism

Whether tedious Calculations in Algebra and Fluxions be the likeliest Method to improve the Mind? And whether Men's being accustomed to reason altogether about Mathematical Signs and Figures, doth not make them at a loss how to reason without them? (*The Analyst*, Q38)

In Chapter 3, I outlined some of the corner stones of Berkeley's anti-mathematicism, particularly emphasising his scorn over the reputations for brilliance afforded to those working in speculative or pure mathematics. Speaking of the mathematical philosophy of the previous age in the *Queries*, Berkeley asks:

Whether from this, and other concurring Causes, the Minds of speculative Men have not been born downward, to the debasing and stupefying of the higher faculties? And whether we may not hence account for the prevailing Narrowness and Bigotry among many who pass for Men of Science, their Incapacity for things Moral, Intellectual, or Theological, their Proneness to measure all Truths by Sense and Experience of animal Life? (*The Analyst*, Q57)

Far from making men smart, or truly strengthening or sharpening the mind, as we saw his freethinking counterpart suggest in the opening sections of the *Body*, Berkeley believes the study of pure mathematics, detached as it is from the real world, makes people narrow and leaves them deprived of their natural faculties.

According to Berkeley's Euphranor, obsession with complexities and contradictions is misplaced:

²⁵⁸ I am particularly keen to emphasise that there is little evidence for Jessep's claim that Berkeley adopts a much more orthodox philosophy of mathematics by the time of *The Analyst*. I concede that Berkeley's position is complex, requiring an unusual balancing of pragmatic endorsement and metaphysical scepticism, but I think there is plenty of evidence that Berkeley sustained many of the radical metaphysical responses to mathematics that we see in the notebooks and *NIV*.

As to the perplexity of contradictions and abstracted notions, in all parts whether of human science or divine faith, cavillers²⁵⁹ may equally object, and unwary persons incur, while the judicious avoid it. (*Alciphron*, D7 §18)

Further shots at the expense of mathematicians contained in the Queries include:

Whether to decline examining the Principles, and unravelling the Methods used in Mathematics, would not shew a bigotry in Mathematicians. (*The Analyst*, Q15)

Whether certain Maxims do not pass current among Analysts, which are shocking to good Sense? (*The Analyst*, Q16)

Whether anything but Metaphysics and Logic can open the Eyes of the Mathematicians and extricate them out of their Difficulties? (*The Analyst*, Q51)

Whether Mathematicians, who are so delicate in religious Points, are strictly scrupulous in their own Science? Whether they do not submit to Authority, take things upon Trust, believe Points inconceivable? Whether they have not their Mysteries, and what is more, their Repugnancies and Contradictions? (*The Analyst*, Q64)

Whether it might not become Men, who are puzzled and perplexed about their own Principles, to judge warily, candidly, and modestly concerning other Matters? (*The Analyst*, Q65)

The Proper Object of Geometry

Whether the mistaking the Object and End of Geometry hath not created needless Difficulties, and wrong Pursuits in that Science? (*The Analyst*, Q3)

One of the central themes of Berkeley's early rhetoric against the mathematical practice of his time is its treatment of the object of geometry, and its concept of geometric denotation. He returns many times to the impossible, non-existent objects of the geometers and the wrongness of modelling a theory aimed at

²⁵⁹ Definition of 'caviller' from Johnson's *A Dictionary of the English Language Volume 1*: 'CAVILLER, A captious disputant.' (Johnson, 1768) Given this definition, it is strange to think of his not seeing the Body of *The Analyst* as a case of cavilling. And indeed, since I take Berkeley to be arguing from the position of a freethinker, rather than from his own perspective, it is natural to think that he would have considered the arguments of the Body to be a case of cavilling.

application in science on an idealisation involving objects he thought could have no correlates in nature, such as zero-dimensional points and one dimensional lines. Thus, his numerous frustrations with the geometers' treatment of abstract extension as the proper object of geometry:

Mem: To examine the Math: about their point what it is something or nothing, & how it differs from the M.S. (N345)

The Mathematicians think there are insensible lines, about these they harangue, these cut in a point, at all angles these are divisible ad infinitum. We Irish men can conceive no such lines. (N393)

Subvertitur Geometria ut non practica sed Speculativa. (N509)²⁶⁰

Geometry seems to have for its object tangible extension, figures & motion Sc not visible. (N101)

In *NTV* and *Principles*, these views are restated in various ways. Berkeley emphasises that geometry should have as its object, or at least its focus, geometry as relative, treated in a way that conforms to our experience of extension, rather than its conception purely in the abstract.

It is commonly said that the object of geometry is abstract extension: but geometry contemplates figures: Now, figure is the termination of magnitude: but we have shewn that extension in abstract hath no finite determinate magnitude. Whence it clearly follows that it can have no figure, and consequently is not the object of geometry. (*NTV*, §124)

That geometers are mistaken in their object of discussion (or the idealisations inherent in their models) is still very much a feature of Berkeley's metaphysical suggestions in the *Queries*. Appealing to the roots of geometry in particularised calculations of space and area (bearing in mind that prior to Ancient Greek mathematics, there was no real sense of mathematical generality), Berkeley suggests that this 'tie to the land' should be upheld in mathematical methodology:

Whether the end of Geometry be not to measure assignable finite extension? And whether this practical View did not first put Men on the study of geometry? (*The Analyst*, Q2)

Whether Men may properly be said to proceed in a scientific Method, without clearly conceiving the Object they are conversant about, the

²⁶⁰ Geometry is destroyed when it is not practical but speculative – my own translation.

End proposed, and the Method by which it is pursued? (*The Analyst*, Q4)

Whether, if the end of Geometry be Practice, and this Practice be Measuring, and we measure only assignable Extensions, it will not follow that unlimited Approximations compleatly answer the Intention of Geometry? (*The Analyst*, Q53)

And then, he reiterates the same thought expressed in different ways in the *NTV* and *Principles*, and repeatedly in the notebooks:

Whether it be possible to free Geometry from insuperable Difficulties and Absurdities, so long as either the abstract general Idea of Extension, or absolute external Extension be supposed its true Object? (*The Analyst*, Q7)

The commitment of most mathematicians to geometry as the study of abstract extension, as well as the commitment of many in science to the notion of absolute space, is a source of the difficulties he sees in many of the concepts of mathematics. Though I think we should see his acknowledgement that most of the theories work and are useful (perhaps as approximations) as the approach that dominates his perspective, ideologically speaking, it is clear that Berkeley has opinions on why mathematics has, in his view, so many paradoxes: it mistakes its object. This view makes it difficult to see how he could have come to share a mathematically orthodox outlook with his contemporaries. The other dominant feature he sees as having caused trouble is the treatment of finite extensions as infinitely divisible.

Infinite Divisibility

Whether it doth not suffice, that every assignable number of Parts may be contained in some assignable Magnitude? And whether it be not unnecessary, as well as absurd, to suppose that finite Extension is infinitely divisible? (*The Analyst*, Q5)

In Chapter 3, I outlined the tension between Berkeley's early metaphysics and the notion of infinite divisibility held by most practicing mathematicians. The examples of overextending this property of abstract geometry, typified by John Keill's inference from the infinite divisibility of geometric extension to the infinite

divisibility of all and any extension, particularly frustrated Berkeley. Since that discussion was quite detailed I won't here appeal back to the same examples charting his distaste for infinite divisibility throughout his philosophy. At various points in the *Body*, Berkeley seems almost comfortable with the notion of infinite divisibility, as a traditional mathematician would be, and speaks as one at home with this feature of Euclidean geometry. In the following excerpt, he discusses the supposition that there is no end to geometric division:

But according to the received Principles it is evident, that no Geometrical Quantity, can by any division or subdivision whatsoever be exhausted, or reduced to nothing. (§17)

This assumption is treated as a given in the *Body*. This is noted explicitly by Jesseph in a footnote in which he remarks that this is in tension with a number of places in the *Queries*. Jesseph's footnote reads:

Footnote 10: Here Berkeley comes close to endorsing the thesis of infinite divisibility, which he elsewhere denies (*Cf.* *Queries* 5, 6, 18 and 52).

I explain this tension as arising out of the fact that Berkeley is speaking from different positions in the *Body* and the *Queries*. In *Alciphron* (Dialogue 7, §18), Berkeley references the debate between indivisibles and infinite divisibles as one of those which should be seen as less insignificant in light of the usefulness of the science of geometry. So, in terms of metaphysics, Berkeley still thinks that infinite divisibility is a prominent cause of troubles in the logic of mathematics.

Whether from Geometrical Propositions being general, and the Lines in Diagrams being therefore general Substitutes or Representatives, it doth not follow that we may not limit or consider the number of Parts, into which such particular Lines are divisible? (*The Analyst*, Q18)

However, from a pragmatic point of view, that is a conceptual or speculative issue that should be forsaken given the success of the theory in application.

In all three cases we see contrasts between the *Body* and the *Queries*. On the point of anti-mathematicism, the *Body* begins with the view that, at least in limited cases, geometry and mathematics are good for the mind, and engender a habit of fine reasoning if done well. Yet, the *Queries* lament the fact that the actual outcome of a lot of speculative mathematical thinking is that one's mind narrows and

becomes insufficiently subtle for dealing with the important problems of life. In the case of the proper object of geometry, Berkeley speaks in the *Body* as though the position that the proper object of geometry is abstract extension may be taken for granted. Yet, in the *Queries*, we see Berkeley return to complaints about the proper object of mathematics that should be familiar from the previous chapter. In the infinite divisibility case, we see the Berkeley of the *Body* quite at home with the assumption of infinite divisibility, or at least willing to discuss the logic against that backdrop, and then blaming the very same scheme in the *Queries* for the many paradoxes he sees in the foundations of mathematics.

Thus, I am convinced that one looking for Berkeley's views on the philosophy of mathematics in the 1730s should be directing their attention at *Alciphron* and the *Queries*. If they want to know how Berkeley thinks we should ultimately view practices that are useful and promote well-being, while having some logically troublesome comments, he makes his views on these matters clear in *Alciphron*. If we want to know why the mathematics of the period was, as he saw it, plagued with foundations worries, we should look to the *Queries* for the deeper issues in the tensions between mathematical idealisations and the world of experience.

4.4

The Analyst: Interpretative Verdict

As should be clear, I am convinced that in most cases, the *Analyst* is misconstrued as a neutral account of Berkeley's mature position on the philosophy of mathematics. This misconception and its detrimental consequences are particularly obvious in a recent paper by Katz and Sherry, in which the place of the book as mathematical criticism is challenged on the grounds that Berkeley may be getting more credit than he deserved. The authors quote Wisdom, Jesseph, Cajori, Strong, Bell, Robinson, all stating their approval of Berkeley's foray into the calculus debate and claiming an ultimate role in honing some better method. Katz and Sherry

suggest they are too quick in their praise of him because of (1) ‘the critique’s ill-informed nature’²⁶¹ and (2) ‘[Berkeley’s] contradictory attitude when writing about a different field of mathematics, such as arithmetic.’ (Katz & Sherry, 2013, p. 615)

Of the latter criticism, they say:

The exposition of Berkeley’s critique of the calculus by Jesseph (1993) is described as “definitive” by Sherry (...), who finds, however, shortcomings in Jesseph’s evaluation of that critique. Sherry notes Berkeley’s double standard in his attitude toward arithmetic and geometry. Thus, Berkeley accepts the practice of arithmetic on the purely pragmatic grounds of its utility, reflecting an instrumentalist position. For Berkeley, arithmetic lacks empirical content, i.e., numerals do not denote particular perceptions; the same length can be 3 (feet) or 36 (inches). (Katz & Sherry, 2013, p. 592)

Their arguments concerning the claim that the mathematics of *The Analyst* are ill-informed are predominantly a product of the fact that Berkeley collapses the two approaches to calculus (of Newton and Leibniz) into one another, and fails to note that Leibniz had plenty of philosophical and mathematical justification to defend himself against what is typically seen as the strongest aspect of Berkeley’s critical challenge, the ‘logical argument’. The second, that the position outlined in the *Body* commits him to inconsistencies in his treatment of different kinds of mathematics is untrue if my reading is followed. He makes distinctions in the *Queries* between symbols denoting geometric vs algebraic entities, but these are offered as a recommendation for those with the naïve realist approach of most practicing mathematicians of the period.²⁶² In *Alciphron*, the generality of his

²⁶¹ This argument turns on Berkeley’s unawareness of various philosophical resources arising out of Leibniz’s philosophical system—particularly, the transfer principle, a precise codification of Leibniz’s law of continuity (provided by Łoś)). Whether or not he was aware of Leibniz’s law of continuity, or the ‘transition state’ account of mathematical equality he provides, one can be sure he would have had plenty to say about it. Leibniz: ‘a state of transition may be imagined, or one of evanescence, in which indeed there has not yet arisen exact equality (...) or parallelism, but in which it is passing into such a state, that the difference is less than any assignable quantity; also that in this state there will still remain some difference, ... some angle, but in each case one that is infinitely small; and the distance of the point of intersection, or the variable focus, from the fixed focus will be infinitely great, and the parabola may be included under the heading of an ellipse.’ (Leibniz & Child, 1920, p. 149 (paraphrase from Katz and Sherry))

²⁶² Here, I think my reading can make sense of Carl Boyer’s assertion, after his discussion of *The Analyst*, that Berkeley is a naïve realist about mathematics. It seems that way because he is talking about those commitments. (Boyer, 1959, p. 227)

recommendations about pragmatic value should absolve him from the second part of this criticism, and may bear interestingly on the first. Given Leibniz's fictionalism about infinitesimals, it's not obvious that Berkeley would have actually seen fit to criticise his account, but merely the fervid and philosophically unsubtle adulation of it by the kind of freethinkers to whom *The Analyst* is addressed.

I discuss the balancing of the pragmatist and metaphysically critical parts of Berkeley's philosophy of mathematics in the final chapter, but by way of prefacing that discussion, I should say here that I think Berkeley simultaneously endorses the following two positions. (1) Calculus and the entities it invokes should be evaluated in light of their usefulness in application and contribution towards well-being, and thus accepted on pragmatic grounds. (2) There are deep metaphysical reasons that calculus has ended up with the issues it has. Which position takes priority for Berkeley? *Alciphron* suggests (1) should be at the top of the hierarchy in considerations of calculus, but that this is so shouldn't prevent him from espousing some guidance in line with his views on (2). It's clear that Berkeley's rhetorical focus shifts in the philosophy of the 1730s, and that though he has much to say about the metaphysics of various issues, those kinds of discussions have been relegated in importance for him.

Defence of Freethinking in Mathematics and Reasons for Not Replying

It is noteworthy that when Berkeley defends his criticisms against the Newtonian disciple, James Jurin, he calls his response a *Defence of Freethinking in Mathematics*. What he's defending is his right to subject the tenets of mathematics to the same kind of scrutiny and analysis that religion is routinely subjected to (by, according to Berkeley, those who happily accept the mysteries in mathematics and reject them in religion). This should, again, flag the fact that the point of view from which the arguments against calculus were launched was one that it is difficult to see as Berkeley's own. Berkeley is not a freethinker; when he argues as a

freethinker it is because he believes that mathematics should be subjected to the same scrutiny that deist freethinkers subject religion to, to show such opponents the minuteness and inappropriateness of their intelligibility criteria. He advocated for a public philosophy that could accommodate the difficult concepts of both religion and science in *Alciphron*. The freethinking criticism is to introduce the ‘stick’ that goes naturally with the scientific/mathematical benefits, or ‘carrot’, of a pragmatic/functionalist approach to meaning.

In §3 of *DFM*, though Berkeley defends the practice of applying freethinking criticism to mathematics, he re-emphasises the subtle (though he thought it should be obvious) nature of the argument of *The Analyst*. It is, first and foremost, an ad hominem argument about religion, and in presuming that Berkeley himself wrote it merely (or even actually) to criticise Newton’s calculus, Jurin has misunderstood him:

You are, it seems, much at a loss to understand the Usefulness or Tendency or Prudence of my Attempt. I thought I had sufficiently explained this in the *Analyst*. But for your further Satisfaction shall here tell you, it is very well known, that several Persons who deride Faith and Mysteries in Religion, admit the Doctrine of Fluxions for true and certain. Now if it be shewn that Fluxions are really most incomprehensible Mysteries, and that those, who believe them to be clear and scientific, so entertain an implicate Faith in the Author of that Method; will not this furnish a fair *Argumentum ad Hominem* against Men, who reject that very thing in Religion which they admit in human Learning? And is it not a proper Way to abate the Pride, and discredit the Pretensions of those, who insist upon clear Ideas in Points of Faith²⁶³, if it be shewn they do without them even in Science. (*DFM* §3)

The remainder of the *DFM* sees him defend the logic underlying his freethinking criticisms (often comparing it with the logic applied to theological cases) and defending his right to use those criticisms to showcase the hypocrisy he found inherent in many of those who criticised religion but blindly praised mathematics.

The most comical (and perhaps slightly cruel) element of Berkeley’s interaction with Irish mathematician John Walton in *Reasons for Not Replying* (1735) resides in a theme that continues throughout the length of the text. Berkeley, in what might be seen as a very early instance of what we now refer to as

²⁶³ See my previous note on Toland and Biddle.

'trolling', proceeds as though Walton's presumably sincere defence of Newton is so poorly executed, that the only sensible explanation of it is that Walton, by bumbling public defences of fluxions and Newtonian science, really sought to humiliate Newton and expose the silliness of his ideas. Berkeley returns to this theme relentlessly:

The true reason is, that he seems at bottom a facetious man, who under the colour of an opponent writes on my side of the Question, and really believes no more than I do of Sir Isaac Newton's Doctrine about Fluxions, which he exposes, contradicts, and confutes with great skill and humour, under the masque of a grave vindication. (*RNR*, §1)

And if so, then this notable Defender hath cut out new Work for himself to defend and explain. But about this, if I mistake not, he will be very easy. For, as I said before, he seems at bottom a back Friend to that great Man; which Opinion you will see further confirmed in the Sequel. (*RNR*, §6)

To conclude, I accept this Professor's Recantation, nor am at all displeased at the ingenious method he takes to disguise it. Some zealous Fluxionist may perhaps answer him. (*RNR*, §21)

One feature of Berkeley's writing in *RNR*, is that he repeatedly takes up the issues of author sincerity, internal consistency, and the possibility of one's arguing in one direction when they purport to argue in another. The issue of rhetorical doublespeak is itself a topic of the pamphlet:

It must be owned, in an age of so much ludicrous humour, it is not everyone can at first discern a Writer's real design. (*RNR* §2)

It is difficult to read this without connecting it to the previously quoted section of *DFM*: 'You are, it seems, much at a loss to understand the Usefulness or Tendency or Prudence of my Attempt.' (*DFM* §3) In an ironic twist, Berkeley accuses his opponent of doing almost the same thing as he does himself in *The Analyst*: arguing from a point of view that is not one's own, in order to damage the reputation of one's opponents.

Here, I believe ironically, Berkeley alleges that Walton is inconsistent with Newton, and with himself, when Berkeley in *The Analyst* has argued in a way that is inconsistent with his own instrumentalist philosophy. Further, Berkeley makes the comparison between the mathematical and religious cases again, as if to remind us of the ad hominem intention of the text: 'could there remain any doubt

of his being a disguised Freethinker in Mathematics, who defended Fluxions just as a certain Freethinker in Religion did the Rights of the Christian Church?' (*RNR*, §2). As in *DFM* we are reminded of the central role of freethinking to *The Analyst* endeavour.

4.5

Conclusion

I have argued that much of this debate, for Berkeley, is conducted from the point of view of one with ostensibly pretty different philosophical sentiments to his own. Berkeley's priority in his mature position (that in *Alciphron* and in other writings of the period such as *A Sermon Preached before the Incorporated Society*) is to emphasise practical benefit and usefulness over the 'barren speculation' he sees taking over so many domains of discourse.²⁶⁴ And yet, his public interactions over calculus seem to do just the opposite (in many places), concentrating on logical coherence and summarily noting its public benefit. We should think that Berkeley thinks the problems of calculus are ultimately caused by geometry's separation from experience, and its foundations in an idealisation that means its consequences don't reflect the actual world. That being said, metaphysics aside, if you will, its application to macro-level mechanics and science has been fruitful, and given this fruitfulness it should be accepted on the grounds that it serves a great public good.

Berkeley's is an unusual position—justifying a discipline on the basis of its pragmatic utility despite having plenty to say about the metaphysical and mathematical reasons for its problems. The following comparison may shed some light on his position. It is possible to worry about a theory on the basis of its grounding or connection to reality, while acknowledging its value and even encouraging its use. Imagine one who thinks psychoanalysis benefits people in

²⁶⁴ This concept is discussed in more detail in the chapter on the philosophy of *Alciphron*.

providing a lens through which they can explore their psychological history and their personal narrative. That same person may also believe that the theory itself is quite false. It serves a good purpose, but may be flawed in its underpinnings.²⁶⁵ Or, Plato's conception of the 'Noble Lie' in the *Republic* may be more instructive. Even in a situation when one knows the falsehood of foundational parts of a system, one may encourage belief or continued belief in a system among a population who ultimately benefit from confidence in the myth. The practical utility of applied mathematics renders acceptable continued false belief about the assumptions underpinning its metaphysical theory.

Remembering the centrality of Berkeley's general anti-mathematicism is important here since it explains why, despite being satisfied with a discipline on utility grounds, he still can't resist weighing in on the cause of its problems. The position of mathematicians in academic society and public life was a real source of frustration to Berkeley. That much is clear from the notebooks, from sections of the early editions of the *NTV*, from the *Principles*, from parts of the *Queries*, and from the tenor of the debate with Jurin and Walton.

²⁶⁵ I pretend no expertise on psychoanalysis, but I know it to be subject to various criticisms with regard to the scope of its causal claims and along the lines that it has no testable implications for falsification.

Chapter 5: Early Modern Ad Hominem Arguments and the Ad Hominem Arguments of *The Analyst*²⁶⁶

5.1

Introduction

In this chapter I focus on the ad hominem component of *The Analyst* and give my account of the nature of ad hominem argument as understood in early modern philosophy. I do this to avoid any worries over an anachronistic interpretation, and to make the case that my understanding of *The Analyst* and its ad hominem intention sits very naturally in the rhetorical context of the time. Beginning with Geoffrey Cantor's original remarks on the religious aspect of the text, I expand on that project to show how those motivations, if true, should dramatically impact our understanding of the claims made with *The Analyst*. I also briefly provide reasons why the mainstream scholarship has failed to consider this option and its consequences. Using Haakonssen's account of what he laments as 'the epistemological paradigm', I offer an account of the ad hominem in the early modern period and suggest it played a somewhat different role in the philosophy of the time than that argument now plays most frequently in public discourse. I offer a detailed account of the form of ad hominem on offer in *The Analyst*, and finally I explain why taking this component of the text seriously (which I believe the scholarship has routinely failed to do) allows us to see the Queries to *The Analyst* in a new light.²⁶⁷

²⁶⁶ To avoid a risk of self-plagiarism, I should note that the majority of the material in this chapter has since been published in the *British Journal for the History of Philosophy*: (Moriarty, 2018).

²⁶⁷ Even in Cantor's 'Berkeley's *Analyst* Revisited', where we agree on many of the fundamentals concerning Berkeley's motivations, I find that he stops short of following these considerations to their logical conclusion. If Berkeley is trying to make a point

5.2

Motivation of the *Ad Hominem*

Though I hope my case for my reading of *The Analyst* is mostly clear by now, some brief rehearsal is in order before the account of the early modern ad hominem and the specific forms of the arguments in *The Analyst*. Cantor was the first to draw adequate attention to the fact that *The Analyst* is ‘not concerned solely with mathematics, or even the philosophy of mathematics, but also with theology.’ (Cantor, 1984, p. 668) Cantor and I differ in perspective on the matter of how we should read Berkeley’s engagement with mathematics in *The Analyst*, but agree that his decision to write about calculus is motivated by thinking about religion and the intelligibility standards applied to it.²⁶⁸ Cantor describes Berkeley’s tactics in terms of what he calls ‘The Matthew Strategy’ and he sees Berkeley’s main goal as ‘hoisting the freethinker with his own petard’ (Cantor, 1984, p. 675):

On several occasions in the earlier work [*Alciphron*] Berkeley shows that the freethinker does not adhere to his proclaimed standards—that if the standards of rationality propounded by the freethinker are fairly applied, religion appears in a better light than does infidelity. (...) Jesus says: “First cast out the beam out of thine own eye; and then shalt thou see clearly to cast out the mote out of thy brother’s eye.” (Cantor, 1984, pp. 668-669)

My interpretation and conclusions differ considerably from Cantor’s: firstly, I don’t think we should see the mathematical criticisms as indicative of Berkeley’s ultimate views on the mathematics in questions, namely, calculus; secondly, our accounts of Berkeley’s views on language differ. However, the opinion that the question of Berkeley’s theological motivations is an important one, and vital to understanding

about religion and the methodological standards it is routinely unfairly subjected to, should we really read the vehicle for this rhetoric as straight-faced mathematical philosophy?

²⁶⁸ Though Cantor notes that the motivation for the criticism is to make a point about the freethinkers’ methodological standards, he reads the calculus criticism as earnest. Given that Berkeley signals that he is utilising the freethinking approach in the criticism, I think we should read the criticism as conditional on an antecedent he doesn’t endorse, but believes his opponents do.

how we should read *The Analyst*, is very much shared in both interpretations, and Cantor's account has influenced my thinking considerably.

By now, the chronology of the key events should be fairly clear—*The Analyst* was written shortly after Berkeley returned from his three year stay in North America. The failure of the ultimate goal of that trip caused him to return to Europe in 1731.²⁶⁹ 'Westward the course of empire takes its way' was the final sentiment expressed in his poem 'Verses on the Prospect of Planting Arts and Learning in America', and there can be little doubt that he saw America as essential to the future of Christian morality. For a variety of reasons, Berkeley's college aspiration was never realised.²⁷⁰ Early in 1732 he published *Alciphron*, which was for the most part written in America and, in Luce's words 'was his main, if not his only, positive achievement during his stay there, and would probably never have been written, but for his visit to America (...)' (*Life of Berkeley*, 132).²⁷¹

Alciphron was bound with the *NTV*, because Berkeley believed that the divine language proof for the existence of God therein was best considered in conjunction with his main work on visual perception. For Berkeley, *Alciphron* was an apology in two senses—in the traditional sense of a defence of Christianity against particular arguments, but also as a more personal apology for what must have represented to him a huge failure to secure what he hoped would be a better future for his faith and his conception of morality in the colonies.²⁷² Criticism of *Alciphron* prompted responses from Berkeley in various ways, but most notably in his publication of the *Theory of Vision Vindicated (TVV)*, which was his response to a letter in a contemporary publication in which an anonymous author criticised his position, defending the Lockean view from his presentation of aspects of it in *Alciphron*. In

²⁶⁹ Luce outlines the imperialist/missionary project as follows: 'He will spend the rest of his days in the island of Bermuda. He will build a college there for the education of the sons of English planters and of the native Indians in religion and useful learning. They will come from the mainland of America, and will stay at the island college till they are of M.A. standing; they will then return to their own people fitted to be missionaries'. (Luce A. , 1949, p. 97)

²⁷⁰ In Chapter 2, I include correspondence in which Berkeley blames freethinking and its increasing popularity for this failure. (Hight, 2012, p. 336)

²⁷¹ Luce suggests that its publication only a few weeks after his return from America suggests the text was likely 'ready for the press when he landed' (*Life of Berkeley*, 133).

²⁷² The opening lines of *Alciphron* attest to this. Tellingly: 'Events are not in our power; but it always is, to make a good use even of the worst' (*Alciphron*, D1 §1).

his introduction to *TVV* he prefaces his response with the following lines, which highlight his anxieties in this period and demonstrate his worry that the lessons of *Alciphron* will not be heeded:

[B]eing persuaded that the Theory of Vision, annexed to the Minute Philosopher, affords to thinking men a new and unanswerable proof of the existence and immediate operation of God, and the constant condescending care of his providence, I think myself concerned, as well as I am able, to defend and explain it, at a time wherein atheism hath made a greater progress than some are willing to own, or others to believe. (Berkeley G. , *TVV*, 1975, p. §1)

Later in the same work, he clarifies his thinking on the scope and influences of the aforementioned atheism:

That Atheistical principles have taken deeper root, and are farther spread than most people are apt to imagine, will be plain to whoever considers that Pantheism, materialism, fatalism are nothing but atheism a little disguised; that the notions of *Hobbes*, *Spinoza*, *Leibniz*, and *Bayle*²⁷³ are relished and applauded; that as they who deny the freedom and immortality of the soul in effect deny its being, even so they do, as to all moral effects and natural religion, deny the being of God, who deny Him to be an observer, judge, and rewarder of human actions; that the course of arguing pursued by infidels leads to Atheism as well as infidelity. (Berkeley G. , *TVV*, 1975, p. §6)

Berkeley's targets are the freethinkers of the previous chapters and they are very much in the foreground of his attention in the writing of *Alciphron* and *The Analyst*. To recap, freethinking is conventionally associated with early deism (though it includes other alternative approaches to religion and society that would not be best understood as deist), and is frequently (for Berkeley) associated with an anxiety over the unclear role for God in a materialist system.

We are now in a position to synthesise and summarise the accounts of freethinking in the previous chapters and give a cursory summary of the philosophical tendencies which troubled Berkeley so greatly. Those tendencies include: (i) a rationalist treatment of theology and its concepts (one finding fault in the often logically problematic or vague definitions of religious concepts); (ii) an

²⁷³ This grouping echoes Berkeley's early insistence in the notebooks that the metaphysics of a number of his predecessors invariably led readers away from religion: 'My Doctrines rightly understood all that Philosophy of Epicurus, Hobbs, Spinoza, etc w^{ch} has been a Declared Enemy of Religion Comes to y^e Ground'. (p. N824)

increasing belief that reason should be held above revelation in the case of theology (with an aversion to the miraculous or mysterious); and (iii) a desire to reinterpret biblical content—particularly miracles—naturalistically.

As I have argued, the motivating worry in *The Analyst* is that the exalted status of mathematics *qua* rational science tended to confer on its specialists the status of experts of rationality in general.²⁷⁴ Berkeley thought this was disastrous for a number of reasons (addressed particularly in my second chapter), but he was particularly worried given the very unusual (metaphysical and epistemological) nature of mathematics. He saw a genuine danger of a rationalistic logical tyranny in which context-sensitive or more complex or vague concepts would be treated as deficient. Religion, in most cases, makes no attempt to present itself as a fully coherent scientific system, so, to judge it on the basis of its failure to meet that criterion, according to Berkeley, is ill-advised. Further, to respond to that kind of demand by seeking to transform religion into something closer to that standard—as Berkeley thought some freethinkers naively or disingenuously attempted to do—was equally dangerous. In Berkeley’s view, (i) it is unlikely it could be successful in that light (given the necessary role for faith and mystery in Anglicanism), and (ii) it is not clear that it’s a universally good standard even for non-religious business. Certainly, Berkeley was of the impression that certain aspects of religion (particularly Anglican morality) were losing support in Europe and that freethinking, broadly speaking, was a significant contributor.

The polemical tone of the work is a striking reminder of its primary intention. Its opening paragraphs are noteworthy, and highly charged. The first paragraph is prefaced with the section heading: ‘Mathematicians presumed to be the great masters of reason. Hence, an undue deference to their decision where they have no right to decide. This one cause of infidelity’. (The Analyst, Preview of §1) The following, as should be clear, is not a conventional way to begin an article that ostensibly discusses a development in mathematical technique:

§1 Though I am a stranger to your person, yet I am not, sir, a stranger to the reputation you have acquired, in that branch of learning which hath been your peculiar study; nor to the authority that you therefore

²⁷⁴ In Chapter 3 I argued that this was a key feature of his anti-mathematicism.

assume in things foreign to your profession, nor to the abuse that you, and too many more of the like character, are known to make of such undue authority, to the misleading of unwary persons in matters of the highest concernment, and whereof your mathematical knowledge can by no means qualify you to be a competent judge. Equity indeed and good sense would incline one to disregard the judgement of men in points which they have not considered or examined. But several who make the loudest claim to those qualities, do, nevertheless, the very thing they would seem to despise, clothing themselves in the livery of other men's opinions, and putting on a general deference for the judgement of you, gentlemen, who are presumed to be of all men the greatest masters of reason, to be most conversant about distinct ideas, and never to take things upon trust, but always clearly to see your way, as men whose constant employment is the deducing truth by the justest inference from the most evident principles. With this bias on their minds, they submit to your decisions where you have no right to decide. And that this is one short way of making infidels I am credibly informed. (*The Analyst*, §1)

Exegetical Complexity and Mathematical Legacy

For a number of reasons, *The Analyst* is more difficult to place among his among his other philosophical works. With the *Principles*, *NTV* and *Dialogues*, things are easier; his notebooks furnish us with insights on his thinking prior to writing them, the *Principles* and *Dialogues* have instructive introductions, often detailing his philosophical intentions, and they see more discussion in his correspondences. We have Berkeley's remarks from the heated exchange following the publication of *The Analyst*, but as I suggest below, and alluded to in the previous chapter, they are more retrospectives than summaries, and lack some of the editorial innocence of an introduction.²⁷⁵ A number of the typical sources from which scholars can gain additional insights on Berkeley's thinking are unhelpful in the case of *The Analyst*. The most recent edition of his correspondences has just one reference to *The Analyst* by Berkeley. In a letter to Thomas Prior, Berkeley makes a quick reference to the project, saying:

²⁷⁵ They are important to my interpretation, but I want to flag their difficulty as sources here to suggest it as a reason why they receive less attention in the literature.

As to myself, by regular living, and rising early (which I find the best thing in the world), I am very much mended; insomuch, that though I cannot read, yet my thoughts seem as distinct as ever. I do, therefore, for amusement, pass my early hours in thinking of certain mathematical matters, which may possibly produce something. (Hight, 2012, p. 359)

As a sole reference, this isn't a bombardment of detail, and makes it seem as though the project has a somewhat spontaneous character (which is amazing given the level of detail in the criticisms in *The Analyst* and the fact that the polemical tone of the work is hardly suggestive of a passing interest).

In a much later reference, in *Siris*, there is a suggestion of some satisfaction over the debate instigated by *The Analyst*, even if there's no suggestion that such debate caused uncertainty over the broader rational status of mathematics:²⁷⁶

Our judgement in these matters is not to be overborne by a presumed evidence of mathematical notions and reasoning, since it is plain the mathematicians of this age embrace obscure notions and uncertain opinions, and are muddled about them, contradicting each other and disputing like other men: witness their doctrine of fluxions, about which, within these ten years, I have seen published about twenty tracts and dissertations, whose authors being utterly at variance, and inconsistent with each other, instruct bystanders what to think of their pretensions to evidence. (*Siris*, §271, Footnote)²⁷⁷

Other than these references—the letter to Prior and that in *Siris*—the natural sources for judging how Berkeley thought of *The Analyst* are the documents he wrote in the public exchange following its publication. In terms of public reception, *The Analyst* was largely misunderstood as a sweeping attack on Newton—indeed, the responses from Newtonians make it clear that many believed Berkeley's infidel

²⁷⁶ This footnote occurs amid criticism of the mathematical arguments of the 'geometrical philosophers' in favour of absolute space, which, Berkeley advises, we should not overestimate. By mentioning the mathematical arguments in the preceding decade he seeks to draw attention to the fact that mathematicians are just as rancorous and argumentative over obscure parts of their work as any other group. Thus, they do not deserve the additional weight that their status as mathematicians confers on their claims.

²⁷⁷ The reference to those authors 'utterly at variance' would capture well the disagreement between James Jurin and Benjamin Robins over the correct interpretation of Newton's theory of limits in Jurin (1734) and Robins (1735). For discussion of this disagreement, see Guicciardini (1989, pp. 45-46).

mathematician to be Newton himself.²⁷⁸ Both *Alciphron* and *The Analyst* excited agitated responses, and Berkeley's own responses are revealing, but I would caution, not straightforward guides to *The Analyst*. The *DFM* and *RNR* are his published responses and they both respond to defenders of Newton.²⁷⁹

Though in the majority of his philosophy Berkeley sought to make clear his respect for Newton (he receives clear praise in *De Motu* and *Alciphron* in particular), this was a sensitive time for Newtonianism. As I discussed in the last chapter, the priority debate certainly played a role in defensiveness over Newton's respectability. It is easy to see why, in this environment, even a critique aimed at those who followed him overzealously was interpreted as contributing to a situation in which the good name of the country's foremost mathematician and scientist had been called into question. With so much hostility having arisen on the continent, it's easy to understand that low estimations made public at home were poorly received. And, Berkeley has certainly been regarded as a guilty party in this regard:

In the first edition of *The Principles of Human Knowledge* (1710), Berkeley criticized the *Principia*. (He softened the tone of these criticisms in later editions, although he remained an ardent critic of the calculus/fluxions; see Schliesser 2011a.) Even Locke, whose views were assimilated with Newton's by French thinkers of the middle of the eighteenth century such as d'Alembert, expressed cautious reservations about Newton's claims. He confined the application of

²⁷⁸ This is unfortunate since it is quite clear from *The Analyst* that the person/persons addressed in the text are distinct from Newton, who Berkeley claims the addressees venerate so fully and uncritically that they fail to scrutinise the foundations of his work, deferring to his brilliance in (according to Berkeley) no less faithful a way than the theist accepts religious miracles. James Jurin's editor confirms this in her introduction to the 'Analyst Controversy': 'Jurin took this as an attack on Newton, and proceeded to defend Newton's approach to fluxions' (Rusnock, 1996, p. 38). Additionally, Newton died in 1727, whereas the purported addressee of *The Analyst* is characterised as still living in 1734.

²⁷⁹ Some of those who responded to Berkeley's work were the Cambridge scientist James Jurin, the mathematician Thomas Bayes, and the Irish mathematician Jacob Walton. Colin Maclaurin's two-volume *Treatise of Fluxions* (1742) was certainly written in response to *The Analyst*. Maclaurin begins: 'A letter published in the year 1734, under the title of *The Analyst* first gave occasion to the ensuing Treatise, and several reasons concurred to induce me to write on this subject at so great length. The Author of that piece has represented the method of fluxions as founded on false reasoning, and full of mysteries'. (Maclaurin, 1742, p. i)

Newton's theory to astronomy (see Domski 2012). (Schliesser E. , 2013, p. 41)²⁸⁰

And indeed, it seems Berkeley was in some ways right to worry that consistency with Newton's philosophy might become a kind of acid test against which future thought would be evaluated.

The most important consequence for philosophy of Newton's *Principia* is also the least remarked upon. In the wake of the *Principia*'s success, Newton's authority was used to settle debates within philosophy and to change the character of philosophical theorizing. (Schliesser E. , 2013, p. 52)²⁸¹

Berkeley's responses to Newtonian defenders of calculus cannot have helped matters. His first response to the public debate, *DFM*, discussed in the previous chapter, is remarkably indelicate. The opening is illustrative of the tone and tenor of the exchange following *The Analyst*. He begins:

When I read your defence of the British mathematicians, I could not Sir, but admire your courage in asserting things so easily disproved. (*DFM*, §1)

RNR begins:

There are some men that can neither give nor take an answer, but writing merely for the sake of writing multiply words to no purpose. (...) [Walton] seems at bottom a facetious man, who under the colour of an opponent writes on my side of the Question, and really believes no more than I do of Sir *Isaac Newton's* Doctrine about Fluxions, which he exposes, contradicts, and confutes, with great skill and humour, under the masque of a grave vindication. (*RNR*, §1)

The ensuing exchange is a hostile one. Berkeley spends a significant proportion of *RNR* accusing Walton of covertly arguing against Newton. Both texts contain

²⁸⁰ The two papers here referred to are Schliesser's 'Newton's Challenge to Philosophy: A Programmatic Essay' (2011) and Domski's 'Locke's Qualified Embrace of Newton's *Principia*'. (2012)

²⁸¹ This remark in Schliesser (2013) is followed by an example from P. van Musschenbroek's *Elementa Physica conscripta in usus academicos* (*The Elements of Natural Philosophy*) in which attempts to explain natural philosophy via metaphysics are derided by van Musschenbroek as always leading to the author's 'falling into mistakes'. Schliesser regards this as an argument from authority grounded in a European intellectual landscape 'dramatically changed' by the reach of Newtonianism. (Schliesser E. , *Newton and Newtonianism in Eighteenth-Century British Thought*, 2013, p. 52)

insights illuminating Berkeley's understanding of the ad hominem intentions of *The Analyst*, but the vitriolic nature of the texts does some work in explaining why they haven't been regarded as philosophically serious enough to merit much attention in the scholarship.

Additionally, the intellectual respectability of the mathematical criticisms in *The Analyst* has played a role in its interpretation. The critical sections of the text are largely seen by mathematicians and mathematical historians to have been an important critical step in the securing of the later foundations of the calculus in epsilon delta limit calculus and nonstandard analysis. As a result, they are regarded in isolation from their relationship to what was otherwise a very unorthodox philosophy of mathematics. Berkeley was an early proponent of a number of ideas that have come to be regarded more positively in more contemporary philosophy of mathematics: we find in different stages of Berkeley's work early formalist thinking, and early structuralist and psychologistic interpretations of pieces of mathematics. Frustratingly, his contributions are rarely discussed in contemporary philosophy of mathematics, except in conjunction with the infinitesimal/fluxion critique. As such, I think the mathematical respectability of his criticisms leads to a tendency to ignore what was for him the point of that endeavour, which was to criticise freethinking and to show the weakness of its methodology. Reid puts this very nicely:

Some of these accounts have, in passing, mentioned the fact that Berkeley's declared motive in writing the book was a theological one, but they have then swiftly shifted away from theology to examine the mathematics in isolation from it. G. J. Warnock, for instance, dismisses Berkeley's 'ostensible' motive in writing the book as being 'hardly a serious point'.²⁸² It is true, of course, that the theological issue which concerned Berkeley—the intelligibility of Christian mysteries—tends not to animate many philosophers any more, and mathematicians still less so, which is why there is a tendency for many commentators on *The Analyst* to place this issue on a high shelf, with a little embarrassment, so that they can then get to work more seriously on the 'real' message and the 'important achievements of that book. (Reid J. , 2002, p. 1)

²⁸² The Warnock quote is from Warnock (Warnock, 1953, p. 212).

That the ultimate intention of this valuable mathematical contribution may have been as a component of what we typically designate a fallacious model of reasoning (ad hominem), and one about religion (no less), may have played a role in the popularity of this more scientifically respectable interpretation. As Berkeley says in his response to what he regards as Jurin's misapprehension:

You are, it seems, much at a loss to understand the usefulness or tendency or prudence of my attempt. I thought I had sufficiently explained this in the *Analyst*. But for your further satisfaction shall here tell you, it is very well known, that several persons who deride faith and mysteries in religion, admit the doctrine of fluxions for true and certain. Now if it be shown that fluxions really are most incomprehensible mysteries, and that those, who believe them to be clear and scientific, do entertain an implicate faith in the author of that method; will not this furnish a fair *Argumentum ad hominem* against men, who reject that very thing in religion which they admit in humane learning? And is it not a proper way to abate the pride, and discredit the pretensions of those, who insist upon clear ideas in points of faith, if it be shown that they do without them even in science. (*DFM* §30)

In this sense, *The Analyst* and *Alciphron* share motivational context—they are concerned with the legitimacy of certain beliefs in view of certain technical issues, and with confronting the philosophy he took the freethinkers and deists of his time to be promoting. In *TVV* he implored those sympathetic to freethinking arguments to 'instead of causing scandal to good men, and triumph to atheists, discreetly explain away this first sense, and return to speak of God and his attributes in the style of other Christians' (*TVV*, §6). Berkeley obviously believed that a fully naturalised religion was no religion at all, and that to demand that religion satisfied the same rational criteria as that advised for empirical science was to call for the beginning of the end of it.

5.3

Ad Hominem Arguments: Contemporary and Early Modern

Before outlining the arguments relevant to *The Analyst*, some broader discussion of ad hominem arguments is necessary to sooth potential worry of anachronism. What follows is analysis of the treatment of ad hominem arguments in the scholarship surrounding Berkeley—I survey some applications of ad hominem-style argument among early modern thinkers, and then assess how Berkeley is likely to have thought of this style of arguing. Berkeley had a preference for a particular kind of ad hominem argument: one that can seem less problematic than the quintessentially bad ‘abusive’ ad hominem arguments familiar from, for example, much modern political discourse.

There has been some change in the common-sense understanding of the argument over time. The method of argument wasn’t treated with the same level of suspicion in the eighteenth century (and before) as it is in modern usage, where almost all talk of ‘ad hominem’ is thought to be fallacious talk, and this is almost certainly due to shifting conceptions of what represents a true case of the argument-type. Further, in the eighteenth century the ad hominem can be thought of as representative of a feeling that a philosopher should be able to live in accord with his or her principles, and that performative contradiction between life and theory reflected on the tenability of a theory itself. This view is more commonly acknowledged in ancient than modern philosophy, but is taken seriously by Berkeley, especially in his writing about freethinking.²⁸³

Many of the early modern references to the ad hominem argument prior to Berkeley point to a distinction between arguments directed purely at a topic and arguments that appeal to circumstances or features of an opponent or arguer.²⁸⁴

²⁸³ It is also likely that consistency among a philosopher’s various theories may have been even more important in a period where, in most cases, philosophers tended more towards a sort of philosophical generalism, and where it was very likely that a well-known philosopher would be expected to have views on quite disparate philosophical subjects.

²⁸⁴ Some such examples follow: In 1588, astrologer John Harvey’s discourse on prophesies features a claim that he was taught ‘to dispute rather *ad Rem*, than Ad hominem’ Harvey (1588). In 1599, the Jesuit author Robert Parsons’s *A Temperate Ward-word* refers to the argument-type by name in saying that it ‘is an argument...which the logicians call, ad hominem.’ Parsons (1599) William Ames (in *A Fresh Suit Against Human Ceremonies in God’s Worship*) accuses his opponent of having ‘forgotteth that some arguments, and answers are ad hominem, that is they respect

This *res-homo* distinction is thought to be relevant to understanding the nature of one's own argument. That the expression is widely maintained in the Latin phrasing "*argumentum ad hominem*" suggests that it is something like a term of art in logic or rhetoric of the period. Whether its roots truly extend back to Aristotle—as has been disputed negatively by Walton and positively by Chichi—seems to, per Hintikka, reduce to a question of how narrowly we define ad hominem argument.²⁸⁵

In his introduction to the *Cambridge Companion to 18th Century Philosophy*, Haakonssen describes a feature of early modern philosophy often under-emphasised in philosophical histories of the period: the significance of the relationship between the life and work of the philosopher. Haakonssen discusses the misfortune of the limiting idea that the early modern philosophical period should be thought of primarily in light of what he calls the 'epistemological paradigm'. Working within this paradigm involves interpreting early modern philosophy as a period in which philosophers primarily made progress on questions of epistemology (particularly in response to scepticism), and endorsing the idea that 'the theory of knowledge is at the core of all sound philosophy'. In assessing the limits of this paradigm, Haakonssen notes that it is regrettably 'at considerable

the thing in quæstion, not simply, but as it commeth from such a man.' Ames (1633) Robert Boyle (in 1684) uses the term to outline his proposed response to an Epicurean criticism of one of his argument's premises—he says the judgement may be proved against the Epicureans ad hominem. (Boyle, 1684)

²⁸⁵ Chichi (2002) argues that there are two discernibly different Aristotelian versions of the ad hominem that have structural features identifying them with two versions of the modern argument: the abusive and circumstantial variants (she includes *tu quoque* under circumstantial). Walton sees the issue as 'trying to solve the historical problem of how the circumstantial ad hominem, as distinct from the direct or so-called 'abusive' ad hominem, came into logic.' (Walton D. , 2004, p. 360) Walton disputes Chichi's identification of a certain piece of Aristotle as a case of circumstantial ad hominem, arguing that the excerpt in question is instead either an argument of 'inconsistent commitment' or an 'appeal to popularity or presumption by common knowledge'. In 1993, Hintikka had made clear that Aristotle's view on rhetoric would make tracing what is typically treated as a fallacy in subsequent scholarship tricky and problematic depending on how rigid one's sense of the boundaries between ad hominem and other kinds of relevance/commitment arguments. Hintikka: '[D]ialectical (interrogative) arguments ad hominem need not be fallacious. They are merely arguments against an opponent that work only against that particular answerer. They turn on answers not implied by earlier answers (or by premises everybody shares). Incidentally, this line of thought shows why it is hopeless to try to find an anticipation of ad hominem fallacy in Aristotle's remarks, for a perfectly successful argument can according to him be ad hominem'. (Hintikka, 1993, p. 19)

variance with the philosophical self-understanding common in that period' (Haakonssen K. , 2006, p. 13) and his assessment reveals some insights that are crucial to understanding the role of the ad hominem argument as it may have been considered in Berkeley's time.

Haakonssen challenges one aspect of the epistemological paradigm by cautioning that austere separation of theory and practice wasn't in place in the way that histories of philosophy often suggest is characteristic of the advent of early-modern philosophy. 'The ancient idea that the value of a philosophy had to show itself in the life of its proponent retained great significance. While there is an established literature that approaches ancient philosophy in this light, it is only recently that something similar has been attempted with some aspects of early modern thought.' (Haakonssen K. , 2006, p. 16) As examples of recognition of this feature he points to Bayle's commentary on Spinoza's life and Adam Smith's obituary of Hume.²⁸⁶ 'Spinoza' is the longest article in Bayle's *Dictionnaire Historique et Critique*, and though Bayle is severely critical of many aspects of Spinoza's philosophy, he is admiring of his life as a philosopher, and the extent to which he lived for and by the commitments of his philosophy. Geneviève Brykman refers to Bayle's commentary on Spinoza's personal story as 'full of unqualified praise for Spinoza in both editions.' (Brykman G. , 1987, p. 260) Bayle:

He felt such a strong passion to search for truth that to some extent he renounced the world to be better able to carry on that search. He was not content with having removed himself from all sorts of affairs; he also left Amsterdam because his friends' visits interrupted his speculations too much. (Bayle, *Historical and Critical Dictionary*, 1965, p. 294)

Bayle respects Spinoza's refusal to conform to certain public constraints (in particular, on his pronouncements on the faith practices of the community of his upbringing) in exchange for an easier life (possibly including a pension); Spinoza 'could not submit to such hypocrisy' (Bayle, *Historical and Critical Dictionary*, 1965, p. 291).²⁸⁷ Though Bayle disapproves of Spinoza's philosophy, he admires greatly

²⁸⁶ I expand on these examples considerably in what follows.

²⁸⁷ Refusal to let money get in the way of philosophy is also praised in Berkeley by Jonathan Swift. Writing to a Lord Carteret, Swift described Berkeley as follows: 'He is

Spinoza's conviction in never failing to live by it, especially in light of the practically difficult consequences of doing so.

Adam Smith notes similar conviction in Hume's desire to present himself as a living example of the philosophy he promoted. Especially, in Smith's words, 'during his last illness', Hume is reported to have been remarkably cheerful. Smith reports his last conversation with Hume in which Hume is said to have joked about what possible reasons he could give Charon, ferryman of Hades, for refusing to get into the boat on the Styx. Likely to ensure Hume not be thought of as an atheist who became terrified of divine punishment close to death, Smith constantly underlines Hume's happiness in declining health.²⁸⁸ Smith connects his dying behaviour to that so clearly rendered in Hume's response to some of the potentially startling epistemological consequences of the sceptical build-up in *A Treatise Concerning Human Nature*. 'I dine, I play a game of backgammon, I converse, and am merry with my friends. And when, after three or four hours' amusement, I would return to these speculations, they appear so cold, and strained, and ridiculous, that I cannot find in my heart to enter into them any farther' (*A Treatise of Human Nature*, p. §7).

What Bayle and Smith sought was to establish a kind of consistency in their subjects. Bayle balances at-times sharp criticism of Spinoza's philosophical work with the acknowledgement that he was exemplary in the consistency that he maintained between his philosophy and his life. Smith was protecting Hume from the suspicion of a largely orthodox society—that even the most resolute atheist will tremble near his or her deathbed, irrespective of the supposed confidence of his unorthodox views on religion.

In fact, this very thought is made explicit by Berkeley when, in 'The Pineal Gland of a Free-thinker' in the *Guardian*, he reports on André-François Boureau-

an absolute philosopher with respect to Money, Titles or Power.' This was Swift's response to Berkeley having been 'quite eager to give up an ecclesiastic sinecure of 1000 pounds sterling a year' (Caffentzis, 2000, pp. 12, note 2) in pursuit of the Bermuda project.

²⁸⁸ It's far from clear that Hume was an atheist, strictly speaking, in any straightforward sense, but for the current purposes, he was considered an atheist by many of his contemporaries, and that sense of public opinion was important to Smith in his account of Hume's last days.

Deslandes' (author of 'A Philological Essay, or Reflexions on the death of Free-thinkers, with the characters of the most eminent persons of both sexes, ancient and modern, that died pleasantly and unconcerned, &c.')

behaviour in a recent sickness. Berkeley remarked at his receiving word of this 'gentleman's appearing very sorry that he was not well during a late fit of sickness, contrary to his own doctrine, which obliged him to be merry upon that occasion' and reiterates that 'this gentleman was out of humour when he was sick (...)' (*Guardian*, 156).

Haakonssen laments the fact that these ideas of an intimate connection between life and philosophy, and indeed the pursuit of a philosophical life as such, lie beyond the epistemological paradigm, and are remembered as a 'quaint detail'. He connects this concern with consonance between philosophy and life with what he saw to be a surge in use of ad hominem reasoning:

In view of this role of the life of the philosopher, three other structural features of early-modern philosophy fall into place. First, the pervasive use of the ad hominem argument is significant. Wave after wave of undesirables – epicureans, deists, sceptics – was supposedly stemmed by the argument that they could not 'live' their philosophy. (Haakonssen 2006, 17)

Haakonssen captures something fundamental to Berkeley's outlook in this remark. This general feature of early-modern philosophy finds its specific instantiation in Berkeley in a demand for pragmatic consistency between philosophy as practiced and methodological prescriptivism. When the content-argumentative approach has not been heeded, Berkeley 'stems the flow' with the rhetoric of personal circumstance.

Further examples of his enthusiasm for exactly this kind of appeal can be seen in the articles in Steele's *Guardian* discussed in Chapter 2. Further, the same is true of the other *Guardian* contributors. In the essay 'Remarks on Collins' Discourse of Free-Thinking', Steele pays special attention to a line of thought that he takes to constitute an argument against the ideas expressed in Collins' *Discourse of Freethinking*.²⁸⁹

²⁸⁹ This article has an interesting history. Initially, it was credited to Berkeley by his son, and was included in Fraser's edition of Berkeley's works. On further inspection, Steele

Steele strongly believed that the views outlined in Collins' discourse naturally led to libertinism and depravity, and makes much of his experience that most of the better-known freethinkers aren't actually wild reprobates, but meek scholarly types. If you really believed what Collins recommended, according to Steele, these beliefs would manifest in your behaviour in a significant way. Steele sees the freethinkers (defended by Collins) as characterisable by the following sort of *modus tollens*: If one truly believes the tenets of the freethinkers (or even just those of Collins), then one should behave differently or in a way that marks the difference in belief. Freethinkers, according to Steele, don't actually behave differently than those known to have more orthodox views (or so he claims in the essay), so we should be sceptical of their beliefs in what they recommend, and question their sincerity. The issue of whether it is reasonable to make the sort of inferences Steele does—from change of belief to change of behaviour (and indeed whether or not he can have been in much of a position to know much about the behaviour of many of the relevant people)—is far too remote and complex to approach here. However, this idea that one must in a sense perform their views is at the heart of the sort of ad hominem arguments (the circumstantial and *tu quoque* varieties) in which Berkeley and his colleagues are interested.²⁹⁰

If it were possible to laugh at so melancholy an affair as what hazards salvation, it would be no unpleasant enquiry to ask what satisfactions they reap, what extraordinary gratification of sense, or what delicious

republished it claiming it as his own, and for this reason it was not included in Luce and Jessop's collection of Berkeley's works. I am grateful to a *JHP* reviewer for making me aware of this. For the current purposes, it is interesting either way, since it either represents popular ad hominem argument by Berkeley himself, or by his like-minded colleagues. In what follows, I have treated it as Steele's for convenience, but referenced it in Fraser's work.

²⁹⁰ At first glance, Steele's argument sits uneasily with Berkeley's *Alciphron* arguments. In the latter case Berkeley's concern seems to be that freethinking *will* provoke licentious and immoral behaviour among followers, and that freethinking should be undermined as an approach for that very reason. Above, Steele is suggesting that educated, intelligent people like Collins and those he defends don't seem to actually endorse the views, and tellingly withhold from the kind of belief that would impact their behaviour. His worry seems to be that people less educated and erudite than the scholars of freethinking (Collins, Toland, Shaftesbury, Deslandes and Mandeville) will take it all on board and assent to it with all their energy. Perhaps this can be considered alongside the contrast between the seriousness of the characters Alciphron and Lysicles in *Alciphron*. Perhaps Steele thinks that someone seriously engaged with reason and moral questions (like Alciphron) won't actually fall into the bad (moral and intellectual) habits that a much more frivolous reader (like Lysicles) would.

libertinism this sect of Free-thinkers enjoy, after getting loose of the laws which confine the passions of other men? Would it not be a matter of mirth to find, after all, that the heads of this growing sect are sober wretches, who prate whole evenings over coffee, and have not themselves fire enough to be any further debauchees *than merely in principle*. (*Guardian*, 145, Steele)

It goes without saying that Steele's analysis of Collins is harsh since it is clear that Collins was, at the very least, not publically advocating atheism (which is given as the cause of libertinism he imagines Collins et al should also be manifesting). Nonetheless, Steele makes clear that he thinks it would be interesting to learn that those who believe as he supposes the freethinker does don't openly manifest any of their rejections of certain tenets. His conviction on this is sufficiently strong that he thinks them negligent for not fully exploring the behavioural consequences of the beliefs they recommend (and alleges that they do no investigating themselves):

These sages of iniquity are, it seems, themselves *only speculatively* wicked, and are contented that all the abandoned young men of the age are kept safe from reflection by dabbling in their rhapsodies, without tasting the pleasures for which their doctrines leave them unaccountable. Thus do heavy mortals, only to gratify a dry pride of heart, give up the interests of another world, without enlarging their gratifications in this; but it is certain there are a sort of men that can puzzle truth, but cannot enjoy the satisfaction of it. (...) These Free-thinkers, who lead the lives of recluse students for no other purpose but to disturb the sentiments of other men, put me in mind of the monstrous recreation of those late wild youths, who, without provocation, had a wantonness in stabbing and defacing those they met with. (*Guardian*, 145-146, Steele)

Returning to Berkeley's individual views, though he doesn't make much reference *per se* to ad hominem arguments in his earlier works (pre 1730s), we can at least conclude from his notebooks (and Chapter 1) that he was very familiar with the contents of Locke's *Essay*. Berkeley mentions Locke by name an impressive 71 times in those early notebooks, and it is the material covered in the *Essay* with which he is chiefly concerned. In his discussion of reason and argumentation in Book IV, Chapter XVII ('Of Reason'), Locke treats ad hominem arguments as one of a group of four arguments (§19 *Four sorts of arguments*) which engage contexts of argument rather than exclusively the content of the opponent's position. So, for Locke we have a clear contrast between arguing over the content/internal coherence of a philosophical theory or position and arguing over the

circumstance/external coherence of a philosophical theory or position. According to Locke, one can argue against a position in the traditional philosophical way (by trying to point out flaws in the system/logic/facts supposed) and/or one can try to persuade against the same position by appealing to features external to the pure content of the subject.

Berkeley's notebook entry N817 reads 'Mem: to take notice of Lockes (sic) Woman afraid of a wetting in the Introd: to shew there may be reasoning about Ideas or things' (N817). This must refer to Locke's example of the country gentlewoman, which takes place in the same chapter as his discussion of the *ad hominem* argument.²⁹¹ Berkeley's earlier references (e.g. N668) to the syllogism Locke uses in the same chapter, §8 ('to make a point about particular conclusions of syllogisms'), reinforce the view that Berkeley was very interested in the contents of Chapter XVII, and that we may infer with some safety that he had read it in full and in detail. At the end of the same chapter, before he 'quit[s] this subject', Locke introduces his further argument types. These, 'men, in their reasonings with others, do ordinarily make use of to prevail on their assent; or at least to awe them as to silence their opposition' (Locke, 1975 IV xvii §19)

Locke's four kinds of argument are the arguments 1) *ad vericundiam*, 2) *ad ignorantium*, 3) *ad hominem*, and 4) *ad iudicium*. Locke comments briefly on each and explains that the fourth alone, which he defines as 'proofs drawn from the foundations of knowledge or probability', is the only one that 'advances us in knowledge and judgement' and 'brings true instruction'. Alternatively, the other three are used to support something already argued, or to silence a certain kind of objection. This fits the *ad hominem* component of *The Analyst* very well since Berkeley takes himself to have provided his conventional arguments against freethinking in *Alciphron* less than two years earlier. Locke says: 'A third way is to

²⁹¹ Locke writes: 'Tell a country gentlewoman that the wind is south-west, and the weather lowering, and like to rain, and she will easily understand it is not safe for her to go abroad thin clad in such a day, after a fever: she clearly sees the probable connexion of all these, viz. south-west wind, and clouds, rain, wetting, taking cold, relapse, and danger of death, without tying them together in those artificial and cumbersome fetters of several syllogisms, that clog and hinder the mind, which proceeds from one part to another quicker and clearer without them (...)'. (Locke, 1975 IV xvii §4)

press a man with consequences drawn from his own principles or concessions. This is already known under the name of *argumentum ad hominem*.' (Locke, 1975 IV xvii §21)

The sense Locke presents of arguing *ad hominem* is that of arguing that the opponent's own principles or beliefs entail reasons to doubt his argument, or provide a convincing way to stop an opponent in their tracks, so to speak. Locke's interpretation appeals to what more recent informal logic might call "Argument₂", which is defined as 'a particular kind of interaction', or 'something two or more persons have (or engage in) (...)'. This is in contrast with "Argument₁", which is 'a kind of utterance or a sort of communicative act (...) something one person makes (or gives or presents or utters) (...)'. (O'Keefe, 1977, p. 121) In Locke's presentation, *ad hominem* argument is a device available to an arguer either to bolster support in an already established claim, or, to block an argument presented by an opponent by pointing to features of the argumentative context involving the beliefs, behaviours or principles of the opponent—ideally those related to the content of the argument. Walton calls Locke's interpretation of the argument an *ex concessis* view since it should involve appeal to content already conceded by an arguer.

A later example of Berkeley using this argument and along with it the language of 'concession' occurs in *Alciphron* in a discussion between Euphranor and Alciphron.²⁹² Having committed Alciphron to a series of successive points on seemingly disparate topics (the general good, the nature of wisdom etc.), Euphranor tells Alciphron he has unwittingly affirmed belief in God given the points conceded and ostensible connection between those commitments and God.

Since therefore we are so far agreed, should it not seem to follow from the premises; that the belief of a God, of a future state, and of moral duties, are the only wise, right, and genuine principles of human conduct, in case you have a necessary connexion with the well-being of mankind? This conclusion you have been led to by your own concessions (...) (*Alciphron*, D1 §16)

What is conceded elsewhere is relevant for Berkeley, and, as Locke suggested, it is fair to 'press a man with consequences drawn from his own principles'. It's this Lockean sense of *ad hominem*—broadly covering relevant information about the

²⁹² I am grateful to a reviewer at the BJHP for drawing my attention to this example.

arguer(s) and their commitments—that we should suppose Berkeley endorsed. Rather than an ‘abusive’ ad hominem, the early modern conception of ad hominem was a catch-all for any arguing that took the circumstances of the disputants into account in attempting to block certain arguments or discredit the neutrality of the opponent.

5.4

The Analyst Ad Hominem Arguments and Evaluation Criteria

In this section I outline two separable ad hominem arguments in *The Analyst* and assess them from an informal logical perspective, paying attention to their structural features as examples of ad hominem argumentation. As has been gestured at above, contemporary logic and rhetoric treat ad hominem arguments as subtypes of the relevance fallacy—arguments deemed fallacious in virtue of invoking material which is not obviously relevant to the content of the argument. Such arguments attempt to persuade by pointing to a feature of the opposing arguer, or the group he or she represents, and hoping that that will do some persuasive work in the dispute at issue.

Informal logic provides an appropriate means for discussing Berkeley’s ad hominem arguments for a couple of reasons. Firstly, it sits very naturally with the sort of pragmatism he espouses in *Alciphron*. As discussed in my second chapter, I read the seventh dialogue as primarily a protracted argument for attention to context. The dialogue opens with Alciphron saying he will be willing to believe in the Christian faith only if it can be shown to withstand the tests of ‘absolute certainty and demonstration’, and the rest of the chapter witnesses Berkeley’s Euphranor trying to show Alciphron the wrongness of this. Berkeley’s Euphranor says: ‘Be the science or subject what it will, whensoever men quit particulars for generalities, things concrete for abstractions, when they forsake practical views, and the useful purposes of knowledge for barren speculation, considering means

and instruments as ultimate ends, and labouring to obtain precise ideas which they suppose indiscriminately annexed to all terms, they will be sure to embarrass themselves with difficulties and disputes' (*Alciphron*, D7 §15).

A second reason to prefer it is that informal logic offers a framework and criteria to assess the reasonableness or persuasiveness of ad hominem arguments; it emphasises how successful ad hominem arguments can be in argumentative burden-shifting in actual cases, and since I want to say something about this element of *The Analyst* this seems like a very natural language of discourse.

The following might be thought to be an obviously problematic ad hominem argument: Because the philosopher Gottlob Frege was discovered to be deeply anti-Semitic (amongst other bigotries) we shouldn't believe his philosophy on the foundations of mathematics.²⁹³

Naturally, we think of this reasoning as problematic since whether or not Frege was privately a racist, *at the very least*, it doesn't follow that his mathematical philosophy comes from a problematic point of view, or that you can really reasonably infer anything about the likely veracity of his mathematical views from this personal fact of his history, however abhorrent it is. This is the standard criticism of ad hominem reasoning—formally irrelevant peculiarities get illegitimately bundled up among the premises of an argument.

Another example is the smoker case. In this scenario a parent argues to his or her child that smoking is associated with chronic disorders and that smoking is unhealthy, therefore the child should not smoke. The child replies 'You smoke yourself. So much for your argument against smoking!' (Walton 1998, 3)

²⁹³ I originally used the following example, modified from Walton (1998, p. 2): Because the philosopher Francis Bacon was expelled from his university position on a charge of corruption and dishonesty, we shouldn't believe his philosophy. It was suggested to me (by Maria Baghramian) that this may not be a straightforward example of a bad ad hominem because (in a way that may be particular to the broad nature of philosophy), it may well be the case that claims about a philosopher's character are relevant to whether or not we believe his philosophy. Especially since Bacon frequently wrote on ethical issues and education, we may think that professional failures in ethics or management of an educational institution (if true—it seems politics better explains the dismissal) are relevant to how we should view his ethics.

In this case the child has a more legitimate argumentative response than in the Frege example, because the circumstances mean that the facts about the arguer (the parent) appealed to in the ad hominem do reach out to elements of the given argument. If the parent provides medical data as a motivating reason not to smoke while failing to find that evidence compelling him or herself, then, given the context we may want to say that the child is making a pragmatically reasonable point. This is a good case of what Hintikka calls 'a proof which is possible relative to the answerer but not absolutely' (Hintikka, 1993, p. 19), when he argues that many ad hominem arguments shouldn't be seen as fallacious, but rather as 'arguments against an opponent that work only against that particular answerer.' (Hintikka, 1993, p. 19)

Informal logical analysis affords ways of incorporating pragmatist considerations and assessing the reasonableness or persuasiveness of an argument in its context. Of course, this previous argument would make little sense if levelled at a non-smoking parent, but the point of informal analysis is to attend to elements of the context that should figure in our assessment of the persuasiveness of the argument. Thus, in Walton's *Ad hominem Arguments* it is suggested that we shouldn't automatically classify ad hominem arguments as fallacious, but note their variability and assess their reasonableness in accordance with their specific features. To judge an ad hominem fallacious in the relevant sense requires a demonstration of its relevance violation or an explanation of the reason why a shift of burden of proof is inappropriate.²⁹⁴ This kind of treatment operates under the view that the world is, to a certain extent, a marketplace of ideas, and that in deciding which positions to entertain we must take testimonial credibility seriously and should take pragmatic consistency into account.

²⁹⁴ This is the important difference between the two sample ad hominem arguments (Frege's anti-semitism vs the smoker case). The difference between a good and bad ad hominem might just be the plausibility of the addition of some premise linking the context to the content. In the smoker case we might think all we need is a premise about behaviour being a reliable indicator of relevant/associated beliefs, which might not be too difficult to endorse. In the Frege case it looks like we need some pretty strange premise uniting political beliefs and views on the foundations of mathematics, which I confess I would struggle to formulate, let alone happily endorse.

Part of Walton's methodology in analysing ad hominem arguments is to classify them into subgroups (based on their argument-type: e.g. circumstantial, abusive, tu quoque) and test their strength under categories such as dialectical relevance, subjective and objective evidence, credibility function and relevance of arguer's credibility.²⁹⁵ Under these criteria, the arguments are assessed on the basis of whether they commit or avoid the logical sins historically associated with relevance fallacies.

The following is one framing of the principle ad hominem argument made via *The Analyst*, and is one of the arguments to which Berkeley refers when he states that his objective in DFM is to 'furnish a fair Argumentum ad hominem against men, who reject that very thing in religion which they admit in humane learning.' (DFM §30)

A Tu Quoque Ad Hominem of Pragmatic Inconsistency

Presumed Context: freethinkers argue as follows against religion:

- 1 If a position invokes mysterious concepts or flouts logical laws, we shouldn't believe in it.
- 2 Christianity/revealed religion invokes mysterious concepts and flouts logical laws.
- 3 We shouldn't believe in Christianity/revealed religion.

Berkeley's *tu quoque* response runs as follows:

²⁹⁵ Because of the historical nature of *The Analyst* case, some of the tools in Walton are unsuited to the task, since they involve analysis of the order in which the ad hominem may unfold in a public context, and often requires an ability to question particular features of the case's *argumentation scheme*, which, in the case of this reconstruction of a complicated, historical ad hominem performance doesn't seem possible. Nonetheless, the general criteria Walton provides are helpful in elucidating the features of Berkeley's argument that make it interesting, and reasonable in its context.

- 1' Freethinkers claim that if a position invokes mysterious concepts or flouts logical laws, we shouldn't believe in it.
- 2' Freethinkers actively endorse a position that invokes mysterious concepts and flouts logical laws.
- 3' Freethinkers are inconsistent on positions that invoke mysterious concepts or flout laws and we shouldn't discredit mysterious concepts.

This is an argument from pragmatic inconsistency to the rejection of the freethinking critique of mysteries. An elegant feature of this ad hominem is the ease with which one can highlight a morphism between the logical features (of the religious concepts) criticised by freethinkers and the mathematical logical problems in the calculus (addressed in *The Analyst*). This structural similarity pushes through forcefully Berkeley's complaint about what he thinks is a dangerous standard for intelligibility—if the 'minute analysis' of the freethinker leaves even mathematical theories in need of revelation, then we should be hesitant to accept it as any sort of benchmark. The morphism can be brought out by comparing prominent freethinkers' criticisms of the Holy Trinity and Berkeley's criticism of infinitesimals. In *Alciphron*, Berkeley has his chief freethinking opponent, Alciphron, announce:

Fear not: by all the rules of right reason, it is absolutely impossible that any mystery, and least of all the Trinity, should really be the object of man's faith. (*Alciphron*, D7 §8)

This is a reference to freethinking discussions of the Holy Trinity in the period. Anthony Collins, in his *Discourse of Free-thinking* refers to the Trinity as 'not understandable' and 'unintelligible', and says it 'includes contradictions'. As we have seen, another noted freethinker, John Toland, argues that 'those who stick not to say they could believe a downright contradiction to reason, did they find it contained in the scripture, do justify all absurdities whatsoever, and by opposing one light to another, undeniably make God the author of all Incertitude' (*Christianity not Mysterious*, I ii §6).

Both Collins and Toland refer to the problematic logical properties required by an orthodox interpretation of the doctrine of the Trinity: one God exists in/as three equally divine 'persons' (the Father, the Son and the Holy Spirit), each one is identical or consubstantial with God, but no one of the three is identical with any

other.²⁹⁶ An orthodox interpretation of the Holy Trinity (to which Berkeley was bound by job as well as ideology) requires some violation of the transitivity of identity and that violation generates contradictions. Given its definitional issues, it's not obviously possible to frame a clear idea of the Trinity. Thus, many in the freethinking community said that it was the sort of concept that showed revealed religion to be problematic and deserving of severe scrutiny. Berkeley's move in *The Analyst* is to show that the very same logical issues can be shown to occur in the contemporary foundations of the calculus.

This is to make a point of dialectical relevance, in Walton's terms. As we have seen, Berkeley insists that Newton's fluxion must have the same properties as an infinitesimal. Such an entity must have both 1) a non-zero absolute value (to derive a slope necessary for a tangent), and, 2) an absolute value equivalent to zero (since its multiplicands are made equal to zero). Thus, the entity at the foundations of the new mathematics must, in the course of the same equation, have two incompatible values. And, from such incompatibility, contradictions abound. Importantly, Berkeley does not think that this renders infinitesimals useless or bad (after all, they are compared to the Trinity); it is merely to say that if the freethinkers' methodology finds fault in the logical relations underpinning the Trinity, then they should recognise the same issues arise in calculus. Berkeley thinks both infinitesimals and the Trinity are important and useful in practice, but he takes the freethinkers to be committed to a standard of rigour that should force them to reject both on logical grounds. Berkeley's position (familiar from *Alciphron*) is that freethinkers should reject those logical grounds in favour of pragmatic ones which make space for meaningful interpretations of calculus, as well as those logically difficult parts of religious doctrine.

In §50 of *DFM*, Berkeley's remarks emphasise how concepts in both religion and mathematics (e.g. the Trinity and infinitesimals) require some extension of the rationalistic treatment of concepts advanced by the freethinker:

²⁹⁶ I do not discuss the more recent attempts to rethink the orthodox interpretation (e.g. Swinburne's account of the Father, Son and Holy Spirit as numerically distinct Gods, or Geach's suggestion that identity should always be thought of as relative to a sortal term), largely because Berkeley would certainly have rejected both attempts at reform.

I desire to know, whether those who can neither demonstrate nor conceive the principles of the modern analysis, and yet give in to it, may not be justly said to have faith, and be styled believers of mysteries? Whether it is impossible to find among the physicians, mechanical philosophers, mathematicians and philomathematicians of the present age, some such believers, who yet deride Christians for their belief in mysteries? Whether with such men it is not a fair, reasonable, and legitimate method to use the *Argumentum ad hominem*? And being so, whether it ought to surprise either Christians or scholars? Whether in an age wherein so many pretenders to science attack the Christian religion, we may not be allowed to make reprisals, in order to show that the irreligion of those men is not to be presumed an effect of just and deep thinking? (*DFM*, §50)

On my reading, Berkeley wanted *The Analyst* case to cast doubt on the legitimacy of the presumed rational superiority afforded to mathematicians and logicians, and to show that they should not presume to tell people how to conduct their religious lives. Given the formally problematic status of the mathematics at the time, Berkeley claimed, believing in its truth must have required either a weakening of its deductive methodology, or faith in its ultimate arrival at truth, perhaps given Newton's special brilliance. And, these two attributes (logical vagueness and faith-invocation) were the very features that many freethinkers thought rendered Christianity irrational. In the 64th query of *The Analyst*, Berkeley says:

Whether Mathematicians, who are so delicate in religious Points, are strictly scrupulous in their own Science? Whether they do not submit to Authority, take things upon Trust, believe Points inconceivable? Whether they have not their Mysteries, and what is more, their Repugnancies and contradictions? (*The Analyst*, Q63)

Thus, *The Analyst* offers a further ad hominem, not directed at freethinking methodology, but more so their vaunted status as reasoners. *The Analyst* also argues against the testimonial authority of those who regard proficiency in mathematics as a license to presume expertise on all matters of rationality.

A Circumstantial Ad Hominem Concerning Testimonial Authority

Berkeley judges that the following argument is implicit in freethinking rationale:

- A** If a subject is supremely rational in virtue of its deductive nature and clear concepts, we should see its experts as fit to pronounce on issues of absolute/relative rationality.²⁹⁷
- B** Mathematics is supremely rational in its deductive nature and clear concepts.
- C** Therefore, we should allow mathematicians to pronounce on issues of absolute/relative rationality and mathematical methodology should dictate rationality in other areas.

Berkeley responds in the following fashion:

- A'** If a subject is not supremely rational in its deductive nature and concept clarity, we should not see its experts as deserving testimonial authority in all matters of rationality.
- B'** Current mathematics is not deductive in its nature or clear in its concepts; proponents of contemporary mathematics endorse a logically problematic theory.
- C'** Mathematicians should not enjoy testimonial authority in all matters of rationality.

This argument is less characteristically ad hominem than the previous one, but we should still treat it as such given dependence of **B'** on the support of some particular people of a particular theory (a circumstantial commitment). This argument would be wholly unpersuasive were it not the case that many in mathematical philosophy *actually did* endorse a foundationally problematic theory. The ad hominem runs as follows: 'we shouldn't take your kind as supremely wise, since at least a number of you are committed to this theory that is problematic by your own lights'. It questions the credibility of a group that recommends one standard for rationality in one realm and fails to apply the same scrutiny to its preferred domain (one in which, if anything, it's harder to justify content on context-sensitive grounds since, importantly, Christianity makes no claim to deductive methodology and emphasises a role for faith and mystery). Further, this notion of credibility is

²⁹⁷ Note at this point Schliesser's previous quote concerning a felt need to check for consistency with Newton when evaluating new work in the post-*Principia* era in my section on 'Exegetical Complexity and Mathematical Legitimacy' earlier in this chapter.

relevant since, at least in Berkeley's view, there is an implicit appeal to general rational authority at issue.

Given the sparsity of commentary from Berkeley on the purpose of *The Analyst*, we should take his *DFM* remarks about the importance of his ad hominem intentions in its writing seriously. The *Siris* reference also provides an interesting reminder that, in a discussion about the rational authority of mathematical philosophers and how much heed to pay them, Berkeley takes a moment to relish the fact that various mathematicians have been disagreeing and debating in public. When it comes to matters of natural science and the opinions of mathematical philosophers, "our judgement in these matters is not to be over-born by a presumed evidence of mathematical notions and reasonings." (*Siris*, pp. §271, Footnote) This demonstrates a certain satisfaction at the role he played in contributing to the consternation and a sense of having de-stabilized the reputation of mathematicians as perfect, uniformly agreeing, and hyper-rational beings. Another reason to seriously consider this primarily ad hominem interpretation (that *The Analyst* is intended more as a rebuke of a hypocritical and overly dogmatic rationalism than as a statement of mathematical philosophy), is the pressure that the alternative reading puts on the consistency of his views in *Alciphron*.

Conclusion

I have argued that the classic presentation of Berkeley's philosophy of mathematics relies on a too-literal interpretation of *The Analyst*. One consequence of this has been the perception that Berkeley changed his position on the metaphysics of mathematics, finally coming to regard classical mathematics and all of its metaphysical excesses in a positive light.²⁹⁸ This is so even though he seems to endorse much of his early philosophy of mathematics, if in the interrogative form, in the Queries to *The Analyst*. When, in the Body of *The Analyst*, Berkeley seems to praise classical mathematics as a source of knowledge about the world and proceeds as though its principles are settled truths, he does so, on my reading, in his opponent's voice.

Treating *The Analyst* as primarily ad hominem allows us to challenge Berkeley's seemingly positive disposition towards pure mathematics therein. This is in contrast with his earlier views, and is puzzling since his views on perception and metaphysics cannot obviously accommodate much of the contemporary mathematics. Considering the piece as primarily an ad hominem argument, as I have, allows us to understand that praise as imitating the style of the freethinking/deist theologians who speak the language of reverence, extolling the virtues of religion, when in fact their program within that field will ultimately cause problems for it. This behaviour in freethinkers is made much of in the *TVV*, where

²⁹⁸ 'It hath been an old remark that geometry is an excellent logic. And it must be owned that when the definitions are clear, when the postulates cannot be refused, nor the axioms denied: when from the distinct contemplation and comparison of figures, their properties are derived, by a perpetual well-connected chain of consequences, the objects being still kept in view, and the attention ever fixed upon them; there is acquired a habit of reasoning close and exact and methodical: which habit strengthens and sharpens the mind, and being transferred to other subjects, is of general use in the inquiry after truth.' (*The Analyst*, §2) Though the foregoing has a conditional character, demanding that mathematics adhere to its avowed principles for it to be considered an 'excellent logic', the consequent concedes an admiration for mathematics and mathematicians that would, in my view, still represent a genuine *volte face* for Berkeley.

these ‘present avowed enemies of Christianity’ are described as engaging with religion ‘under the specious pretext of defending the Christian Church and its rights’ (TVV §2).²⁹⁹ On my reading, this same behaviour is satirised in *The Analyst*.

Considering the Body as a principally ad hominem performance allows us to think of the work’s content as conditional in nature. The real mathematical argument in the *Analyst* is internal: *if* one accepts the axioms of classical analysis *and* one subscribes to the freethinkers’ prescriptions for meaningfulness, *then* one should think calculus is problematic.³⁰⁰ This is a preferable approach to *The Analyst* since it alleviates tension with his pragmatist discussion of infinitesimals (in *Alciphron*). I have argued (in Chapter 2) that it is made clear that Berkeley regards infinitesimals as meaningful insofar as they play a valuable functional role in the scientific theories in which they are used. And, in *Alciphron* (D7 §18), he concedes that value. Additionally, we don’t have to see his view on infinitesimals qua mathematical entities as a product of this logicist engagement with standard mathematics. It allows us to take seriously the idea that the negative rhetorical questions in the *Queries* (in which he is still obviously sceptical about the proper objects of geometry), should be thought of as representing his actual metaphysical views, and the key to what he would have to say about the metaphysics of infinitesimal mathematics.³⁰¹

So, how can one pragmatically endorse a mathematical practice while one is deeply critical of its underlying metaphysics? How is the practice of calculus achieving value, given its mismatch with the world, at least as Berkeley sees it? On my account, Berkeley can believe mathematics is pragmatically justified insofar as

²⁹⁹ His description of the ‘ill effect of untoward defences and explanations of [his] faith’ and the ‘advantage (...) incautious friends give its enemies.’ (TVV §6)

³⁰⁰ It invites a further *modus tollens*. Since, pragmatically characterised, calculus is unproblematic, we might reason back to see which antecedent should be rejected, and Berkeley would of course endorse dropping the freethinkers’ meaningfulness criterion.

³⁰¹ In the *Queries*, Berkeley accuses mathematicians of ‘mistaking the object and end of geometry’ (Q3), conducting a discipline containing ‘insuperable difficulties and absurdities’ (Q7), ‘engaged in disputes and paradoxes concerning what they neither do nor can conceive’ (Q10). He wonders if ‘unravelling the methods used in mathematics would not shew a bigotry in mathematicians’ (Q15) and describes them as ‘puzzled and perplexed by their own principles’ (Q65). Word-count precludes a full discussion of the *Queries*, but hopefully this suffices to convey the anti-mathematical hostility still very much present.

its effects are proven in the science and applied mathematics that make use of it. And, he can believe that the metaphysical suppositions underlying most of mathematics are quite wrong. These can be consistent because it is possible for one set of equations to apply to two different world-schemes in such a way that all mathematical results in the applied domain will be correct, or at least correct to a very near approximation, in both cases.

Let's assume that the two worlds in question are the world of the *Principles* and *NTV*, and the world of, say, Keill's mathematical metaphysics. From what I take to be Berkeley's point of view, the calculus works in the following way. Mathematicians have devised the mathematical foundations in such a way that significant amounts of the theory only apply to an (imaginary) world of space postulated to exist beneath the fundamental parts of the real world (the experiential minima). In spite of this, the mathematics describes the parts where reference does occur sufficiently well that even when the equations drop below the level of minima-reference (where they are no longer referring to anything existing in reality), it is still the case that when they arrive back at the macro level (of minima, the level to which the relevant science is geared) they arrive back through the same door they left through, as it were. This allows for the results to be fruitful and of great practical benefit in both schemas.³⁰²

Considering the Body as an extension of Berkeley's own philosophy of mathematics lends credibility to the view that Berkeley moves from a very radically empiricist position (familiar from the notebooks) via a steady downward trajectory to something approaching a fairly typical approach to classical mathematics, and as I have argued in this thesis, this is not clear from the evidence. The Queries to *The Analyst* represent a strongly Berkeleyan and original criticism of contemporary mathematical metaphysics—one that remains in concert with many of his more

³⁰² Think of a mathematics where the basic units of the number system are all multiples of five (and there are no smaller numbers or increments). Compare this to the natural number system. The applied mathematics of both systems is going to be identical except in the cases where we have inputs or outputs that are less than not divisible by 5. But, if, the world described by the mathematics just so happens to only be composed of things that correspond to the five-based system and never below, no problem will arise from using the mathematics of the system with the extra, superfluous notational content.

idiosyncratic early views, as expressed in the notebooks and as required by the metaphysics of *NTV* and *Principles*. It's not obvious that Berkeley's views on the nature of mathematics in conjunction with his views on perception and metaphysics, which I take it remain intact (if subordinate to his more pragmatic views) in his philosophy in the 1730s, leave room for him to veer back towards more classical geometrical thinking in the way that it has been suggested he does after the *NTV*.

In Jesseph (2010, 226-230), it is noted that though Berkeley mentions the minimal sensible (a central component of his empiricist account of perception) during a discussion of infinitesimals in the *Principles*, that argument is not to be found in *The Analyst*. We differ in interpretation here. Though Jesseph agrees that there is no evidence that Berkeley had given up on his views of minima sensibilia, he thinks that they have become less crucial to his mathematical thinking by the time of *The Analyst*. He says that this view of minima is 'no longer central to his views on analysis in 1734' (Jesseph 2010, 229), whereas I think that the same kinds of worry are present in the Queries section of *The Analyst* in a forceful way, and are absent from the Body because he is not attacking calculus from the point of view of his own beliefs at that point, but from the imagined and hypothetical position of one committed to the truth of all of the machinery of classical mathematics (the freethinker).

The two following points lend further credence to the view that Berkeley still saw the theory of minima as having great importance in the work in the 1730s. (1) In 1732, just two years before publishing *The Analyst*, Berkeley reprinted *NTV* with *Alciphron* without duly altering those sections dealing with minima visibilia (§80-86).^{303,304} There is no evidence of a change of position on minima in the intervening period. (2) In Queries 1-3, Berkeley reaffirms his long-held views that the proper object of geometry is 'the proportion of assignable extensions',³⁰⁵ the historical

³⁰³ I am grateful to an anonymous *BJHP* reviewer bringing this to my attention.

³⁰⁴ There are some stylistic and grammatical changes, but as Luce says '[t]he variants are of no great significance, and they represent no change of doctrine.' (*NTV*, 144, Luce's Introduction)

³⁰⁵ Note similarity to N101.

roots of geometry are in this practical view,³⁰⁶ and that the ‘needless difficulties’ lie in this ‘mistaking the object and end of Geometry. Taken together, it is difficult to resist the idea that Berkeley still thought of perceived extension in terms of minima in the early 1730s and still thought the object of geometry was extension as perceived.

When, per Jesseph, ‘Berkeley’s position in *The Analyst* endorses classical methods’ (Jesseph 1993, 229), it is not to avoid appeal to the minima doctrine, but to demonstrate the internal inconsistency of the freethinkers’ position. The freethinking methodology places too high a burden on rationality and logical consistency; the standard they recommend is shown by Berkeley to be capable of showing calculus to be incoherent. That demonstration tells us something about the freethinkers’ criterion for rationality—if its application will rid science of one of its most useful tools, then it cannot be the only consideration, and thus, cannot provide grounds on which to exclude religious belief. To demonstrate this terrible consequence of that methodological outlook requires playing by its rules, in this case.

We know (from ‘Of Infinites’) that Berkeley was capable of offering a defence of infinites/infinitesimals while (per the notebooks) rejecting almost all of traditional mathematics. This is because he thinks it’s possible for a discipline to have a completely inadequate understanding of its own philosophical nature, but to be useful enough (and prevalent enough: see *Alciphron* §18 and my discussion of the priority debate) in application to overlook its formal inadequacy. Thus, in ‘Of Infinites’ (when he is still committed to the idea theory of meaning) he shows how an infinitesimal might be understood on that account. Later, in *Alciphron*, he rescues the same functionally indispensable item with a pragmatist theory of meaning.

The Berkeley of the Queries expressed ideas similar to those expressed in the notebooks, and I think it is possible to see those queries as committed to a set of mathematical principles he no longer has the energy to argue for. His is like the plight of the ultra-finitist today (*e.g.* Errett Bishop)—the problem with losing the

³⁰⁶ Note similarity to N471

philosophical debate on mathematics is that mathematics continues to grow and develop around the items you reject.

As I have argued in Chapter 4, there are also tensions between the *Body* and the *Queries* on at least three points. Where Berkeley is critical of calculus but admiring of the logic of mathematics in the *Body*, his general anti-mathematicism returns in the *Queries* (especially in *Queries* 15, 16, 38, 51, 57, 64 and 65). His objections regarding mathematicians' views on the proper objects of geometry re-emerge in the *Queries* (especially *Queries* 2, 3, 4, 7 and 53), whereas the punctiform Euclidean landscape is taken for granted in the *Body*. And, he seems committed to arguing from a point of one accepting infinite divisibility in in the *Body*, but then criticises this assumption in *Queries* 3, 5, 18, and 52. Further, Berkeley describes the arguments of the *Body* as having 'claim[ed] the privilege of a Free-Thinker' (*The Analyst*, §2) and, when he defends the work later, he refers to it as a defence of 'Free-Thinking' in mathematics. I read these passages in the strongest possible light. However, it was exactly this point in *The Analyst* that first set me upon this topic, and for me this reading provides a resolution to an incompatible set of positions. Berkeley's description of the project (as claiming the freethinker's privilege) in conjunction with the fact that he has been writing negatively about every aspect of freethinking for the previous twenty years should make us extremely cautious in attributing to him the views that follow it.

I think Berkeley's intentions are central to the correct interpretation of *The Analyst*. Was he an eventual admirer of mathematics who, disliking infinitesimals, wanted to show the issues in a problematic subfield of an otherwise noble science? Or, did he, perhaps satirically, argue that it's deeply hypocritical (and intellectually embarrassing) to hold one high standard of rationality for all and neglect to apply it to one of the vaunted achievements of mathematics, and that such hypocrisy necessarily arises when context and experience are ignored in pursuit of perfect logical coherence. Even the freethinker loses on their preferred approach. The ad hominem element was central to Berkeley, and if anything, that this astute piece of mathematical criticism was really intended as a cautionary tale about methodological absolutism just further highlights the richness of his thought.

The Analyst is a complex work, the understanding of which requires the integration of three strands of Berkeleyan philosophy that present initially as in tension. At the forefront of his 1730s philosophy is a deep, almost neurotic concern with the future of Anglican morality and the future of 'western' society. This anxiety prioritises a pragmatist approach to meaning that Berkeley sees as essential to the vindication of elements of traditional religion, in the face of a new philosophy whose interpretation of meaning puts them under pressure.

In the decisive argumentative passages of the final dialogue of *Alciphron*, Berkeley has Euphranor expound the rejection of the idea theory of meaning began in the *Principles Introduction* and moments later list the 'infinitesimal' (among other divisive mathematical items) as an explicit example of a case where technical problems should be overlooked in light of practical value:

[T]hat they have other uses besides barely standing for and exhibiting ideas, such as raising proper emotions, producing certain dispositions (...) and directing our actions in pursuit of that happiness, which is the ultimate end and design, the primary spring and motive, that sets rational agents at work: that the true end of speech, reason, science, faith, assent, in all its different degrees, is not merely, or principally, or always the imparting or acquiring of ideas, but rather something of an active, operative nature, tending to a conceived good; (...) not only although the ideas marked are not offered to the mind, but even although there should be no possibility of offering or exhibiting any such idea of the mind. (...) (*Alciphron*, D7 §17)

Such are those which have sprung up in geometry about the nature of angle of contact, the doctrine of proportions, of indivisibles, infinitesimals, and divers other points (...). [F]rom a parity of reason, we should not conclude any other doctrines which govern, influence, or direct the mind of man to be (...) the less true or excellent, because they afford matter of controversy and useless speculation to curious and licentious wits (...). (*Alciphron*, D7 §18)

Though this pragmatist outlook becomes prior for Berkeley (and is the dominating influence among the three strands), it exists alongside many of his older, familiar frustrations about failures in mathematical theory and practice—particularly those concerning abstraction and the proper object of geometry (hence, the *Queries*). The social status afforded to mathematics and logic makes airing these issues irresistible to Berkeley, even though they are no longer his primary philosophical objectives. Also present is this ad hominem about the danger of the rationalistic

standard of intelligibility he sees utilised by certain deists and scientists. The same standard that Berkeley believes capable of destroying traditional religion can be shown to be similarly deleterious to disciplines thought to be defined by their rigour. This is the intention of the calculus criticism in the *Body*—to provide a kind of *reductio* against freethinking methodology. Thus, the calculus criticism is a misleading guide to Berkeley's own mathematical views at that point, since it is conducted from the position of the freethinker, whose philosophy he opposed relentlessly over the previous twenty years.

By taking the *Body* out of the question in interpreting late philosophy of mathematics, he can remain consistent on the claims made about infinitesimals in *Alciphron* (they are meaningful and fruitful *qua* syntactical components in instrumentally useful, applied theories), *and* we can resist the urge to interpret him as radically changed in his mathematical opinions (his answers to questions about the metaphysics or existence of infinitesimals can be found in his remarks in the *Queries*). Thus, on my reading, Berkeley can and does accept calculus on pragmatic grounds.

Berkeley's very last words on mathematics, in *Siris*, remind us of his priorities when it comes to mathematicians. He cautions the reader not to take too seriously the metaphysical recommendations of mathematicians—after all, he muses, their reputation for rationality and certainty has been lately damaged by public debate over the proper foundations of fluxions. The mathematicians, it turns out, are guilty of 'contradicting each other and disputing like other men'. (*Siris*, §271, footnote). I believe this de-stabilization of mathematical reputation was a further goal of *The Analyst*.

The philosophical position presented in *The Analyst* is a nuanced and complicated one, in which we see Berkeley walk an interesting line between an intensified pragmatism and an idiosyncratic empiricism. This dissertation emerged out of my puzzlement (discussed in the General Introduction) over the relationship between *The Analyst* and the rest of the Berkeley canon. The purpose of this thesis has been to try to use Berkeley's own characterisations of the work to uncover a position that represents his later philosophical views more faithfully, and I believe

my reading of *The Analyst* in terms of *Alciphron* Dialogue 7 provides a plausible resolution to that original puzzle.

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