

**Theology and Natural Philosophy in Late Seventeenth and
Early Eighteenth-Century Britain.**

By

Christopher Joseph Kenny

~

Submitted in accordance with the requirements for the degree of Doctor of
Philosophy.

The University of Leeds

Department of Philosophy

Division of the History and Philosophy of Science

September 1996.

The candidate confirms that the work submitted is his own and that appropriate
credit has been given where reference has been made to the work of others.

Abstract

A number of historians of science have claimed that the early Boyle Sermons provided a platform for the promotion of a moderate-Anglican social and political ideology underpinned by Newtonian natural philosophy. However, by examining in detail the texts of Richard Bentley, John Harris and Samuel Clarke, this thesis argues that their Sermons should not be characterised as 'Newtonian'. These texts were highly complex literary productions constructed with the intention of achieving victory over the enemies of Christianity. An examination of their rhetorical strategies focuses attention on the *use* to which various cognitive materials - including natural philosophy - were put. Thus the presence of Newtonian concepts in the texts is explained by the aims and overall scholarly programmes of the Lecturers.

It will also be argued that the term 'Boyle Lectureship' is problematic and that the main elements of the Lectureship - Robert Boyle's bequest, the Trustees, the Lecturers, and the Sermons - cannot be conflated into a single historical unit. Therefore, throughout this study, emphasis is placed on the contingent and singular behaviour of individuals located within an ecclesiastical and scholarly community, where career promotion and the notion of scholarly credit were important. The brief in Boyle's last will and testament stipulated that the Lecturers must defend Christianity using the scholarly tools to hand. In this thesis it will be shown that the personnel of the Lectureship conformed to Boyle's brief and that they utilised all available methods and materials in the pursuance of their legal and institutional responsibilities. This approach removes the analysis of the Lectureship from an overarching sociological perspective; instead the Sermons are interpreted as exemplary texts in the rhetorical prosecution of the enemies of Christianity. This study, therefore, acknowledges the complex nature of theological texts in early modern England.

Table of Contents

Abstract	ii
Table of Contents.....	iii
Abbreviations.....	v
Acknowledgements.....	vii

Chapter One

Introduction: Historiographical Issues Concerning the Boyle Sermons.....	1
1. 1. The Boyle Sermons Revisited.....	1
1. 1. 1. The Emergence of an Historiographical Tradition.....	3
1. 1. 2. The Jacob Thesis and its Continuing Presence: the Problem of ‘Lumping’.....	6
1. 1. 3. Newtonianism.....	9
1. 2. The <i>Use</i> of Materials in a Rhetorical Context..	13

Chapter Two

The Piety of a Christian Virtuoso: Robert Boyle’s Will and Acts of Holy Living.....	24
2. 1. ‘Holy-Life’: A Representation of Boyle’s Spirituality.....	24
2. 2. Acts of Charity and Boyle’s Fears for Weak Christians.....	36
2. 3. The Last Will and Testament of a Christian Virtuoso.....	39
2. 4. ‘Notorious Infidels’.....	48
2. 4. 1. Atheists.....	52
2. 4. 2. Theists.....	56
2. 4. 3. Pagans.....	60
2. 4. 4. Jews.....	62
2. 4. 5. Mahometans.....	69

Chapter Three

The Trustees of the Boyle Lectureship.....	75
3. 1. Introduction: A Reassessment of Boyle's Appointments.	75
3. 2. Thomas Tenison (1636 - 1715).	82
3. 3. John Evelyn (1620 - 1706).	88
3. 4. Henry Ashurst (1645 - 1711).....	100
3. 5. John Rotherham (1630 - 1696).....	110

Chapter Four

Richard Bentley: The Use of Natural Philosophy in Pulpit Oratory... ..	115
4. 1. Bentley's Early Career.....	115
4. 2. The Choice of Bentley as First Boyle Lecturer.....	124
4. 3. An Analysis of Bentley's Boyle Sermons.	128
4. 3. 1. Overview: Bentley's <i>Use</i> of Natural Philosophy.....	128
4. 3. 2. The Crime of Atheism.	137
4. 3. 3. The Impossibility of Thinking Matter.....	143
4. 3. 4. The Mechanical Philosophy and the 'noble Frame' of the Human Body.. ..	148
4. 4. Bentley and Newton.....	158

Chapter Five

John Harris and the Prosecution of Atheism.....	173
5. 1. Introduction: The Early Scholarly Network of John Harris ..	173
5. 2. Harris's Position in the Anti-atheist Literature.	186
5. 3. THE SERMONS	196
5. 3. 1. The 'Person' of the Atheist.....	196
5. 3. 2. The 'Principles' of the Atheist.	203
5. 4. Harris no Newtonian?.....	210

Chapter Six

Samuel Clarke: Certainty and Method in the Interests of True Religion and Virtue.	222
6. 1. Introduction.	222
6. 2. The Choice of Clarke as Boyle lecturer.....	229
6. 3. Clarke's Sermons and the 'Mathematical Way'	233
6. 4. Selected Themes in Clarke's Boyle Sermons.....	244
6. 4. Newton as a Resource for Clarke's 1704 Sermons.....	260

Chapter Seven

Conclusion.	268
--------------------------	-----

Bibliography

A. Primary Sources	278
B. Secondary Sources	284

Abbreviations

- Alum. Cant.* J. and J. A. Venn, eds., *Alumni Cantabrigienses. A Biographical List of all Known Students, Graduates and Bishops of the University of Cambridge. From the Earliest Times to 1900* (4 vols., Cambridge, 1922 - 1927).
- BJHS* *British Journal for the History of Science.*
- Birch, *Works* *The Works of the Honourable Robert Boyle* (2nd. ed., 6 vols., London, 1772)
- Bray John Evelyn, *Diary and Correspondence*, ed., William Bray (4 vols., London, 1850 - 2).
- CSPD* *Calendar of State Papers, Domestic Series, of the Reign of William and Mary.*
- Cokayne G. E. Cokayne, ed., *Complete Peerage* (5 vols., Exeter, 1900 - 1906).
- de Beer *The Diary of John Evelyn: Now first printed in full from the manuscripts belonging to Mr. John Evelyn*, ed., E. S. de Beer (6 vols., Oxford, 1955).
- DNB* *Dictionary of National Biography*
- DSB* *Dictionary of Scientific Biography*, ed., C. C. Gillispie, (16 vols., New York, 1970 - 80).
- EWH* Sir William Molesworth, *The English Works of Thomas Hobbes of Malmsbury; Now First Collected and Edited* (11 vols., London, 1839).
- HS* *History of Science.*
- J. Hist. Ideas* *Journal of the History of Ideas.*
- Letsome and Nicholl *A Defence of Natural and Revealed Religion: Being a Collection of Sermons Preached at the Lecture Founded by the Honourable Robert Boyle Esq; (From the Year 1691 to the Year 1732). With the Additions and Amendments of the Several Authors. and General Indexes* (3 vols., London, 1739).
- Maddison, *Life*, R. E. W. Madison, *The Life of the Honourable Robert Boyle, F. R. S.* (London, 1969).
- NER* Margaret C. Jacob, *The Newtonians and the English*

- Revolution 1689 - 1720* (Sussex, 1976).
- NRRS* *Notes and Records of the Royal Society*
- Phil. Writings.* *The Philosophical Writings of Descartes*, eds., John Cottingham, Robert Stoothoff, and Dugald Murdoch (2 vols., Cambridge, 1985).
- S. Hist. Phil. Sci.* *Studies in the History and Philosophy of Science.*
- Turnbull *The Correspondence of Isaac Newton*, eds., H. W. Turnbull, J. F. Scott, A. R. Hall and Laura Tilling (7 vols., Cambridge, 1959 - 77).
- Wood Anthony à Wood, *Athenae Oxoniensis. An Exact History of all the Writers and Bishops who have had their Education in the University of Oxford. To which are Added The Fasti or Annals of the Said University* (4 vols., New York/London, 1967).

Acknowledgements

I owe my greatest debt to Geoffrey Cantor for the seemingly endless patience, kindness and enthusiasm with which he supervised the writing of this thesis. I would also like to express my appreciation to the other members of the History and Philosophy of Science Division at Leeds University for their support, and in particular to Jonathan Hodge for kind words and encouragement when needed. Many thanks also to Mordechai Feingold who was always at the other end of the internet with help and materials; to Michael Hunter for his quick replies to all my queries, and to John Henry for a peep at unpublished work. I am also grateful to the staff of the Brotherton Library, and especially those in Special Collections. It is difficult to adequately express my gratitude to Zoë, Nicholas and David. I owe them an enormous debt for putting up with me - especially towards completion. A special thanks to David for all the proof-reading, and the games of football which helped keep me sane. To John Melaugh who knows how much I have drawn on his erudition and friendship over the years - even though I know he will never admit to it. However, in spite of the efforts of all the above, the remaining errors and oversights in the thesis are my sole responsibility.

Chapter One

And indeed if we consider the Genius and Condition of the *Athenians* at that Time, how vitious and corrupt they were; how conceited of their own Wit, and Science, and Politeness, as if they had invented Corn and Oil, and distributed them to the World; and had first taught civility, and Learning, and Religion, and Laws to the rest of mankind; how they were puffed up with the fulsome Flatteries of their Philosophers, and Sophists, and Poets of the Stage; we cannot much wonder, that they should so little regard an unknown Stranger, that preached unto them an *unknown God*.

Richard Bentley.

Introduction: Historiographical Issues Concerning the Boyle Sermons.

1. 1. The Boyle Sermons Revisited

This thesis is a contribution to discussion of the relationship between theology and natural philosophy in the early modern English period.¹ Its main purpose is to examine the style and content of a selection of texts from the series now known collectively as the Boyle Sermons. Several studies already exist dealing with the Boyle Lectures as sites for the interaction between science and religion.² However, although the importance of the Lectureship has been adequately recognised, none of these studies offers a close reading of the Sermons. In the most widely accepted interpretation, Margaret Jacob portrays the Lectureship as a podium for a moderate-Anglican ideology of social engineering.³ Unfortunately this sociologically-oriented

¹ There is a vast literature dealing with the interactions between Science and Theology in this period. For useful overviews, see, John Hedley Brooke, 'Science and the Fortunes of Natural Theology: Some Historical Perspectives', *Zygon*, 24 (1989), 3 - 22; *Idem.*, *Science and Religion: Some Historical Perspectives* (Cambridge, 1991). 'Bibliographic Essay', pp. 348 - 403. Other relevant authors are cited below.

² John Johannes Dham, 'Science and Religion: The Early Boyle Lectures and the Bridgewater Treatises', PhD. thesis (Case Western Reserve University, 1969); *Idem.*, 'Science and Apologetics in the Early Boyle Lectures', *Church History*, 39 (1970), 172 - 86; Henry. Guerlac and M. C. Jacob, 'Bentley, Newton and Providence', *J. Hist. Ideas*, 30 (1969), 307 - 18; M. C. Jacob, *The Newtonians and the English Revolution, 1679 - 1720* (Sussex, 1976), esp., pp. 143 - 200, hereinafter cited as *NER*

³ Many scholars have accepted that there was a political motivation behind the use of Newton's natural philosophy in the Boyle Sermons. For example, see, John Gascoigne, *Cambridge in the Age of the Enlightenment: Science, Religion, and Politics from the Restoration to the French Revolution*

approach has given very little attention to the individual nature of specific Sermons, or to differences between the personnel involved.

This introductory chapter has two main targets: firstly, a critique of the historiography that has appropriated the Boyle Sermons within a purely sociological context. Secondly, the formulation of an alternative interpretation which emphasises the deployment of rhetoric by the Lecturers in their performance of Boyle's brief, and also investigates the explanatory role of the singular and contingent as opposed to the systematic and socially determined. The next section analyses the emergence of an historiography that would eventually guide the search for the ecclesiastical group responsible for determining the success of Newtonian natural philosophy.⁴ Jacob and others have claimed that an analysis of dominant institutional 'norms' will locate the motivating forces responsible for the adoption of Newtonianism as the most ideologically favoured system of natural knowledge. The Boyle Lectures, Jacob argues, represent a nodal point in the development of a range of Enlightenment values - secularisation, rationality, and liberalism - midway between an originary moment - the politicisation of natural philosophy at the Restoration by Boyle and the Royal Society - and the eventual triumph of the alliance of Newtonianism and Anglicanism. It is the purpose of this thesis to show that many facets of the Boyle Lectureship do not support these claims. Her latest statement on this historical lineage is encapsulated in the following passage:

Science-inspired churchmen readily accommodated and preached physico-theological parables that justified and explained hierarchy, order and authority, both lay and ecclesiastical. Boylean and Newtonian science proclaimed a new and grand natural narrative based upon the very structure of the universe, as derived from mechanical experimentation as well as from mathematical calculation. The narrative offered a scientific allegory explicating God's active role in nature. Guided by Newton's notes on how to

(Cambridge, 1989), Larry Stewart, *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750* (Cambridge, 1992). The widespread acceptance of the Jacob thesis is illustrated by Mandlebrote's comment - 'Of course, natural philosophy could have political consequences too, as the use of Newton's arguments by successive Boyle Lecturers indicated'. Scott Mandlebrote, ' "A duty of the greatest moment": Isaac Newton and the Writing of Biblical Criticism', *BJHS*, 26 (1993), 281 - 302, p. 300.

⁴ Although my own approach has more in common with the History of Ideas. I recognise that ideas do not have a complete independence from their circumstances in specific social and political environments. However, neither am I convinced that the context or background can be unproblematically identified. The explanatory shibboleth 'social and political' is often so vague as to be useless for a precise causal account. For a recent survey of historiographical issues in the History of ideas, see Dominique LaCapra and Steven Kaplan, eds., *Modern European Intellectual History: Reappraisals and New perspectives* (Ithaca, 1982).

read his *Principia* (1687), and speaking from the pulpit both inspired and endowed by the legacy of Robert Boyle (d. 1691), Bentley told the tale intended to re-inforce the polity and located order, harmony and design in the very fabric of the universe.⁵

In the following chapters we will address Jacob's use of the Boyle Sermons in her own narrative, and contrast her interpretations with a close reading of the texts. The Boyle Sermons provide an excellent site for a detailed examination of texts on which the Jacob thesis is based. However, I will argue that they do not satisfy her thesis and cast serious doubts on its historiography.

1. 1. 1. The Emergence of an Historiographical Tradition

Because of the dominance of this sociological interpretation of the Lectureship it will be helpful to trace its emergence in studies dealing with the relationship between science and religion in early modern England. Its unquestioning acceptance of certain presuppositions, as investigative categories, has pre-empted a more nuanced reading - especially of theological texts. The problem with the overtly sociological programme lies in its reduction of theological *texts* to mere ideological indicators. This has satisfied historians sympathetic to Marxism, where theology has long been considered a conceptual tool of the powerful, and consequently its cognitive structures are easily dismissed. This programme underlies the negative responses of Jacob and Guerlac to the focus on metaphysics - as an agent of intellectual change in the history of science - found in the work of Koyré, Metzger and Cassirer. Instead they emphasised the social origins of Newtonianism.⁶ It will be helpful, therefore, to chart briefly the rise of this sociological historiography.

Since the 1930s numerous books, monographs and articles have paid special attention to the interaction between science and religion in mid-to late-seventeenth-century England.⁷ The 1930s provide a point of origin due to the seminal study of R. K. Merton: a work important in its own right but also for the literature which grew

⁵ M. C. Jacob, 'Reflections on the Ideological Meanings of Western Science from Boyle and Newton to the Postmodernists', *HS.*, 33 (1995), 333 - 57, p. 343. For a more nuanced interpretation of Anglican theological programmes, see John Spurr, "'Virtue, Religion, and Government": The Anglican Uses of Providence', in T. Harris, P. Seaward and M. Goldie, eds., *The Politics of Religion in Restoration England* (Oxford, 1990), pp. 29 - 48.

⁶ See, M. C. Jacob, 'The Church and the Formulation of the Newtonian World-View', *Journal of European Studies*, 1 (1971), 128 - 48; Henry Guerlac and M. C. Jacob, 'Bentley, Newton, and Providence (The Boyle lectures Once More)', *J. Hist. Ideas*, 30 (1969), 307 - 18.

⁷ See, Brooke, 'Bibliographic Essay', *op. cit.*, esp. sections II, III, and IV.

out of the response, positive and negative, generated by one of his main claims.⁸ Merton argues that in seventeenth-century England science became *the* cultural focus of the nation. His study sought to provide an account for what he called the ‘newly expressed vitality’ of science. His findings were interpreted on the assumption that societies hold different predominating value systems at different times.⁹ Therefore any social practice, including intellectual activity, must be sanctioned by the legitimating dynamics inherent in that society: he refers, variously, to this network of legitimisation by the terms ‘ethos’, ‘values’, or ‘sentiments’. The predominant value system operating in England during the growth period of natural science was to be found, he asserted, within a religious outlook which he variously labelled ‘Puritanism’, ‘ascetic Protestantism’, and ‘Puritan ethos’. His monograph undermined a widespread, if not completely unquestioned, view which represented science and religion as monolithic antagonists. Furthermore, his investigations demonstrated how the tools of historical analysis (such as statistics, prosopography, the use of actor’s categories) uncovered a situation in seventeenth-century England which did not support the picture provided by a simplistic conflict model. Merton’s study of the link between Puritanism and the rise of modern science generated a scholarly industry of mammoth proportions.¹⁰

Merton’s study of the Puritan impetus to the rise of modern science was primarily devoted to filling a lacuna in sociological work devoted to science as a social institution. Unlike many of the studies which followed, he was not attempting to uncover the relationships *per se* between natural philosophies and theological

⁸ Robert K. Merton’s monograph was first published in *Osiris*, 4 (1938), 360 - 632, as ‘Science, Technology and Society in Seventeenth-Century England’ See the reprinted edition with a ‘Preface’ by Merton, *Science, Technology and Society in Seventeenth-Century England* (New York, 1970). A selection of studies, responding to Merton’s thesis, can be found in Charles Webster, ed., *The Intellectual Revolution of the Seventeenth Century* (London, 1974). For an historical account of the production and reception of Merton’s work see, I. B. Cohen, ed., ‘Impact of the Merton Thesis’, in *Puritanism and the Rise of Modern Science: The Merton Thesis* (New Brunswick/London, 1990), pp. 1 - 111.

⁹ Max Weber, *The Protestant Ethic and the Spirit of Capitalism*. Trans. Talcott Parsons (London, 1930). Parsons was a member of Merton’s doctoral committee at Harvard. See, Cohen, *op. cit.*, p. 6. Two other scholars in the 1930s had already argued for links between Puritanism and science - Dorothy Stimson and R. F. Jones. Their original papers are included in Cohen, *op. cit.*

¹⁰ See, Thomas F Gieryn, ed., *Science and Social Structure: A Festschrift for Robert K. Merton*. Transactions of the New York Academy of Sciences, series 11. 39 (New York, 1980); For an excellent re-appraisal of the response to Merton, see Gary A. Abraham, ‘Misunderstanding the Merton Thesis’, *Isis*, 74 (1983), 368 - 87.

doctrines. Although Merton claimed adherence to a strictly sociological analysis he could not completely avoid using doctrinal formulation as a means of characterising and grouping his actors. In fact much of the literature in response to his monograph focused on problems raised by his definition of Puritanism.¹¹ The term 'Puritanism', his critics argued, seemed to group together individuals from too wide a spectrum of theological and ecclesiastical persuasion. Moreover his concept of 'science' as artisanal, empirical and useful, was in stark contrast with that of Kepler, Galileo and Newton: this mathematical style of natural philosophy would eventually dominate the Royal Society at the end of the century.¹² Kroll explains how

in order to argue a coherent, stable, and constructive alliance between 'puritanism' and 'science,' the operative terms must be so reified, simplified, or broadened as either to render them useless as descriptions of recognisable historical phenomena, or to create illusory causal explanations from at best loosely analogical relations, or both.¹³

One response to this critique of Merton's terminology was the rejection of 'Puritan', as the appropriate description of those responsible for the promotion of modern science, and the suggestion that the term 'moderate Anglican' was more appropriate. Barbara Shapiro, for example, described these 'Latitudinarians' or moderate Anglicans as expounding

an explicitly stated and highly developed body of thought . . . which formulated a moderate, non-dogmatic religion compatible with scientific knowledge [they] elaborated an approach to the epistemology of science compatible with religion.¹⁴

Lotte Mulligan, also argued that the typical Fellow of the Royal Society was 'a royalist, Anglican, university-educated Gentleman'.¹⁵ Merton's lack of finesse over

¹¹ See, John Morgan, 'Puritanism and Science: A Reinterpretation', *The Historical Journal*, 22 (1979), 535 - 60. Morgan is particularly wary of the usefulness of generic terms in historical analysis.

¹² John Heilbron, *Physics at the Royal Society during Newton's Presidency* (Berkeley, 1983). Compare Arnold Thackray, "'The Business of Experimental Philosophy": The Early Newtonian Groups at the Royal Society', *Actes du XIIe longres International d'Histoire des Sciences*, 1 (1970-1) 3B: pp. 155-59.

¹³ R. W. F. Kroll, Introduction', p. 10, in R. W. F. Kroll, Richard Ashcraft, and Perez Zagorin, *Philosophy, Science, and Religion in England 1640 - 1700* (Cambridge, 1992). See, David C. Lindberg and Ronald L. Numbers, eds., *God and Nature: Historiographical Essays on the Encounter between Christianity and Science* (Berkeley/LosAngeles/London, 1986). esp. 'Introduction', which has an excellent brief overview of the response to Merton's study.

¹⁴ Barbara Shapiro, 'Latitudinarianism and Science in Seventeenth Century England', *Past and Present*, 40 (1968), 16 - 41. Jacob's work can be seen as a politicised version of Shapiro's findings.

¹⁵ 'Civil War Politics, Religion and the Royal Society', *Past and Present*, 59 (1973), 92 - 116, p.

terminology notwithstanding, his main claim, that burgeoning support for science was enhanced by the values of a particular religious ethos, continued to be accepted in subsequent historical studies as a fundamental characterisation of the relationship between science and religion. Merton's followers maintained the search for categories to describe the exact contours of the religious *group* responsible for the growth and acceptance of the study of the natural world in the late seventeenth century.¹⁶ Thus for Jacob the problem was to determine the social parameters of the group whose ideological needs was best served by the promotion of a particular form of natural philosophy. This sociological approach directed attention away from the close reading of unfamiliar texts and hence much of the complexity of theological language was lost by a programme of 'lumping' divines simply on the basis of institutional proximity.¹⁷ As Kroll points out, echoing the criticisms of Michael Hunter, it is frustratingly vague to simply assert that a particular complex text, utterance, or idea is merely an expression of an ideology.¹⁸

1. 1. 2. The Jacob Thesis and its Continuing Presence: the problem of 'Lumping'.

According to Margaret Jacob the Boyle Sermons constitute the manifesto of an ideologically-motivated cabal which used the Lectureship to promulgate a socio-political programme based on natural theology (or natural religion) 'underpinned' by the implicit providential order of Newtonianism. Anglican churchmen, she argues,

used the new science of the seventeenth century as a foundation upon which this liberal Christianity might rest its case for God's benevolent overseeing of society and commerce. Chance and disorder are only apparent, not real, they argued, and God instils order in a world made complex by competition, market fluctuations, and (not least) political upheaval. Science, liberal Anglicans argued, proves the reality of that inherent, providentially directed, natural harmony. By the late seventeenth century the new science and the

108. quoted in Lindberg and Numbers. *op. cit.*, p. 5.

¹⁶ For a much more precise account of divines involved in scientific pursuits see, Rogers B. Miles, *Science, Religion and Belief: The Clerical Virtuosi of the Royal Society of London, 1663 - 1687* (New York, 1992).

¹⁷ For a more recent analysis of the 'group' responsible for experimental science see, Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago/London, 1994). For a criticisms of this work, see Mordechai Feingold's review, *Isis*, 87 (1996), pp. 131 - 39.

¹⁸ Kroll, *et al.*, *op. cit.*, p. 11. For Michael Hunter's critique of the use of the term 'Latitudinarian' as a blanket term for religious ideology, see his 'Latitudinarianism and the "Ideology" of the Early Royal Society: Thomas Sprat's *History of the Royal Society* (1667) Reconsidered', in Kroll, *et al.*, *op. cit.*, pp. 199 - 229.

new Anglicanism reinforced one another. . . The Newtonian synthesis entered the eighteenth century as the intellectual construction born in response to the English Revolution. More than any other philosophy of the early modern period, Newtonianism in turn shaped the beliefs and intellectual aspirations of an age we have come to describe as enlightened.¹⁹

Thus according to Jacob a cabal within the ecclesiastical hierarchy of the Anglican church sought to restore and maintain social cohesion in the aftermath of the Glorious Revolution of 1689. By means of a well defined ideology, ‘underpinned’ (Jacob’s term) by Newtonian natural philosophy, a socio-moral code in the form of a rationalised and prudential theology was demonstrated to the burgeoning London mercantile classes. Those who constructed this ideology used the Boyle Lectureship as a ‘Latitudinarian’ forum, where theological insights were reduced to a few basic principles accessible to reason. Furthermore, Jacob characterises the sermons as a *manifesto* whose purpose was to explain the upheavals and chaos of the Revolution by demonstrating a providential order in the social world, which mirrored the Newtonian order recently discovered in the physical universe. The threat to capitalism and Anglican hegemony was forestalled by mechanics.

This conflation of such distinct and loosely-associated historical categories is criticised by J. C. D. Clarke.

Many studies of politics in Britain and America in the late eighteenth century have been premised on a view of the Enlightenment as a process of secularisation, embracing as a necessary unity aristocratic scepticism, bourgeois materialism and proletarian emancipation from patriarchal social relations. Yet each of these component parts has been challenged separately, and finally the ensemble itself is progressively questioned.²⁰

Moreover, Jacob’s characterisation of the link between a particular theological and ecclesiastical outlook has benefited from the manifest success of Newtonianism. It is claimed that the natural order demonstrated in the philosophy of Newton, countenanced schemes of providential arrangement which the putative Anglican cabal

¹⁹ ‘Christianity and the Newtonian Worldview’, in Lindberg and Numbers. *op. cit.*, pp. 238 - 55, p. 240. The unproblematic acceptance of the Jacob thesis allows investigators to base their interpretations on data which is incorrect. For an example of this, see G. Grinnell, ‘Newton’s *Principia* as Whig Propaganda’, in Fritz, P. and D. Williams. eds., *City and Society in the Eighteenth Century* (Toronto, 1973). pp. 181 - 92. Also, Pierre Karszberg, ‘The Cosmological Question in Newton’s Science’, *Osiris*, 2 (2nd. Series, 1986), 69 - 106. Karszberg writes, ‘Bentley, who later became Bishop of Worcester, consulted Newton before writing a series of Lectures to be delivered in 1692 . . .’, p. 69. Neither of these points is correct.

²⁰ J. C. D. Clarke, *The Language of Liberty 1660 - 1832: Political Discourse and Social Dynamics in the Anglo-American World* (Cambridge, 1994), p. 14.

incorporated into the presentation of a social manifesto.²¹ In her reading of the Boyle Lectures the magnification of the importance of Newtonian material is only possible with hindsight. Thus the utilisation of Newton's natural philosophy by a very few Lecturers, and the propagation of Newtonianism as a cultural phenomenon are often conflated. The Boyle Lectures have, by means of these manoeuvres, been posited as both the cause of the success of Newtonianism and as a sign of its social and cultural acceptance.²² However, if we take into account the diversity of materials in the Sermons we undermine the homogeneity demanded of a systematic ideology, based on the foundation of a specific category, viz., Newtonianism. In the light of the eventual success of Newtonianism it is hardly surprising that historians of science have been tempted to focus on its presence in any field in this period. Moreover, the claims regarding the function of Newtonian principles, in disciplines outside natural philosophy, have been greatly exaggerated. For example, Jacob also claims how

Through the efforts of the first generation of Newtonians - Richard Bentley, Samuel Clarke, William Derham, and William Whiston - Newton's natural philosophy was preached from the 1690s onward at the podium provided by a prestigious London lectureship. It was presented as the cornerstone of a liberal, tolerant, and highly philosophical version of Christianity, a natural religion based upon reason and science that came dangerously close to deism but that managed, in Newton's own lifetime, never to slip over that particular ledge.²³

Not only is this prioritisation of reason, in the form of unqualified support for natural religion, in stark contrast with much of the substance of the Boyle Sermons, but

²¹Although there are historiographical problems with the term 'Newtonianism' I think it is safe to claim that there was a Newtonian ethos, which was either defended or challenged, by the time of Newton's death. The issue here is not that the Sermons contributed to the establishment of that ethos, but that the Lectureship was deliberately utilised in erecting a social programme on Newtonian natural philosophy. For analysis, and defence of, 'Newtonianism' in this period see, Robert E. Schofield, *Mechanism and Materialism: British Natural Philosophy in an Age of Reason* (Princeton, 1970); Arnold Thackray, *Atoms and Powers. An Essay on Newtonian Matter-Theory and the Development of Chemistry* (Cambridge, Mass., 1970). Chris Wilde produced an insightful attack on those who purvey a Newtonian hegemony in his 'Hutchinsonianism. Natural Philosophy and Religious Controversy in Eighteenth-Century Britain', *HS*, 18 (1980), 1 - 24. Also, R. W. Home, 'Out of the Newtonian Straightjacket: Alternative Approaches to Eighteenth-Century Physical Science', *Studies in the Eighteenth Century*, 4 (1979), 235 - 49. For a discussion of a range of issues growing out of the 'Newtonian' problem, see Geoffrey N. Cantor, 'The Eighteenth Century Problem', a review of G. S. Rousseau and Roy Porter, eds., *The Ferment of Knowledge: Studies in the Historiography of Eighteenth Century Science* (Cambridge, 1980), in, *HS*, 20 (1982), 44 - 63.

²²The Boyle Lectures, according to Jacob, became the 'major vehicle for disseminating Newtonian natural philosophy to the educated laity'. See, M. C. Jacob, 'Christianity and the Newtonian Worldview', in Lindberg and Numbers, *op. cit.*, p. 244.

²³*Op. cit.*, p. 243.

many of the Sermons were not philosophical and took as their main task a defence of traditional doctrinal subjects.

Whilst I am aware that Jacob's claims have already been criticised on a variety of issues, my own misgivings are mainly the result of her lack of sensitivity over the technical precision that was constantly demanded from divines.²⁴ This lack of sensitivity is not peculiar to Jacob, and it has become a commonplace to ignore textual differences within the Boyle Sermons and lump individuals and concepts on the basis of a broad brush analyses.²⁵ Although the Jacob thesis possesses several strands, which include grouping individuals according to political and ecclesiastical affiliations, my main concern is to question whether the Boyle Sermons were 'Newtonian'.

1. 1. 3. Newtonianism.

The social-contextualist interpretation argues that the presence of Newtonianism (as opposed to alternative natural philosophies) was due to its socially cohesive power - its ability to impose order on an otherwise chaotic universe. Steven Shapin claims that

The priority disputes between Newton and Leibniz and, more generally, the evaluation and institutionalisation of Newtonian philosophy in early eighteenth-century Britain, cannot be understood without examining the dynastic politics of the period from the 1680s to the 1710s.²⁶

It was socially expedient for the Anglican Church to emphasise order in the universe

²⁴ The most cogent critique is still Geoffrey Holmes, 'Science, Reason, and Religion in the Age of Newton', a review of *NER*, in, *BJHS*, 11 (1978), 164 - 71. Holmes' criticisms focus mainly on Jacob's simplistic representation of the post-Revolution political situation. For further discussion of Jacob's claims see, Richard G. Olson, 'Tory-High Church Opposition to Science and Scientism in the Eighteenth Century: the Works of John Arbuthnot, Jonathan Swift, and Samuel Johnson', in John G. Burke, ed., *The Uses of Science in the Age of Newton* (California, 1983), 171 - 204; Christopher Hill, 'Scientists in Society', *New York Review of Books*, 25 (7 Dec., 1978), 37 - 9; Roy Porter, review of *NER*, *Social History*, 3 (1978), 246 - 49; P. M. Heimann, 'Science and the English Enlightenment', *HS*, 16 (1978), 147 - 51. Colin Russell, *Science and Social Change 1700 - 1900* (Hong Kong, 1983), esp. pp. 52 ff., provides a mixed response to Jacob's claims. James E. Force, described Jacob's book as 'the single most illuminating work on Newtonianism in the past several decades', see, *William Whiston: Honest Newtonian* (Cambridge, 1985), p. xxii.

²⁵ For a critique of the practice of 'lumping', see, John Hedley Brooke's review of John Gascoigne's *Cambridge in the Age of the Enlightenment: Science, Religion and Politics from the Restoration to the French Revolution* (Cambridge, 1989), in *Enlightenment and Dissent*, 9 (1990), 125 - 29. esp. p. 127.

²⁶ Steven Shapin, 'Social Uses of Science' in, Rousseau and Porter, *op. cit.*, pp. 96 - 7. Also *idem.*, 'Of Gods and Kings: Natural Philosophy and Politics in the Leibniz-Clarke Disputes', *Isis*, 72 (1982), 157 - 211.

especially in the wake of the recent political upheavals in England. The events of 1689 had, according to Jacob, obliged the leaders of the established church to apply Newtonian natural philosophy 'to the dramatic change in the church's fortunes occasioned by the Revolution'. She asserts that

Newtonian commentators were never simply intent on explicating a principle that would ensure the stability of the natural order. Their system only began with the principles explained in the *Principia*. They knew that ultimately events in the natural realm hinged directly on events in the 'world Politic'. Their aim was to construct both a physical and moral model, a social ideology grounded upon Newton's science.²⁷

However, Boyle did not frame his will to support an ideological programme of the Anglican Church by the new experimental philosophy. He evinced very little interest in the major political and ecclesiastical dramas that rocked the English establishment during his lifetime.²⁸ It is also important to note that Boyle wrote his will in the period immediately after the Revolution Settlement. If his intentions had been to contribute to such a venture he would surely have made this clear by unambiguously phrasing the codicil to achieve those ends and by choosing Trustees who could have more immediately effected such a policy. The Church already had long-established discourses of order from which to draw its material. The various post-Revolution disputes were not conducted by appealing to natural philosophy, a discourse which had relatively less status than many of the more established *scientia*.²⁹

A variation on Jacob's argument that the Boyle Lectureship served as a promotional forum for Newtonian science is found in the work of Larry Stewart. Stewart treats the Boyle Sermons as a public site for the promotion of useful knowledge as opposed to the private world of abstruse scholarship.³⁰ However,

²⁷ *NER*, pp. 141, 192.

²⁸ This apparent lack of interest is significant especially given the involvement of friends such as Gilbert Burnet in the events leading up to the Revolution Settlement and his role in the post-Revolution Church. Tenison was also a staunch supporter of the Revolution. For an excellent discussion of Burnet's rhetorical defence of the events of 1689, see Tony Claydon, *William III and the Godley Revolution* (Cambridge, 1996).

²⁹ The intricacies of contemporary debate on the Revolution are covered in J. P. Kenyon, *Revolution Principles: The Politics of Party 1689 - 1720* (Cambridge, 1977), esp. pp. 5 - 20.

³⁰ Larry Stewart, *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750* (Cambridge, 1992). However, in a recent article, Stewart pays much more attention to the importance of texts, see 'Seeing through the Scholium: Religion and Reading Newton in the Eighteenth Century' *HS*, 34 (1996), 123 - 65.

although science was used sporadically in the Boyle Sermons, they should not be interpreted as a public defence of natural philosophy. Preachers made oratorical *use* of natural philosophy in the defence of Christian doctrine against philosophical and learned attacks. The characterisation of the Sermons which constrains them within the category of a promotional exercise has failed to explain the heterogeneous nature of the Sermons - even among those usually classed as 'Newtonian'. It is essential that we do not lose sight of the distinction between the promotional expansion of science in the early eighteenth century, in the form of public subscription to lectures, and the use of science in the pulpit as a useful weapon in the rhetoricians' armoury. This conflation of distinct discourses allows Stewart, among others, to deploy the following explanation for the popularisation of Newtonianism:

by the early eighteenth century, if Newton was to prove utterly unintelligible to the majority of readers, he had legions of translators and expositors. Various digests of Newton's philosophy, numerous displays of mechanical and philosophical principles, and public lectures galore gave an entirely new voice to the market in natural philosophy.³¹

Stewart's argument is aimed at prioritising public lectures, including the Boyle Sermons, as the principal site for the promotion of natural philosophy: yet most natural philosophy found its way into the public-eye in the form of published texts. Stewart's argument that science made a transition from metaphysics to a 'social and intellectual presence inherited from notions of the frame of the world or of the public good in natural theology', is not confirmed by either the content or the form of the Boyle Sermons.³² The content of the Sermons does not suggest an abandonment of metaphysics. Moreover, Stewart's use of the term 'public' - to signify both the audience for the Sermons and for the popular abridgements of natural philosophy - is so ambiguous that it possesses little or no analytical force.

³¹ *The Rise of Public Science*, p. xxvii. Desaguliers's career serves as a model for examining entrepreneurial behaviour. This causes problems for any empirical sense of the activities of individual Lecturers. Harris, for example, often assumes a place only in an arbitrary referencing list such as - 'Desaguliers, Watts, Harris et al'. Moreover, Stewart presents an odd dichotomy of science as 'an intellectual preserve uncontaminated by the rabble' and science as the 'legitimation of the doctrine of industry' - as if the two were automatically exclusive categories. He insists that the 'legitimising' of science took place outside the world of texts and scholars, when the book of nature replaced the book of words, see *ibid.*, p. xxi. Stewart ties this to an epistemology of 'common experience' - or, public experimentation. What he fails to acknowledge is that most public debate took place in texts between professional scholars. Scholarship did not suffer a demise at the hands of projectors and instrument makers.

³² Stewart, *op. cit.*, p. xxxi

The argument for a Newtonian impetus to the Lectureship relies on the assumption that the Trustees, the Lecturers and the educated laity (a problematic category in itself) would immediately recognise the Newtonian World View and appreciate its relevance to the social order. Jacob, offers precisely such a scenario:

The audience, long steeped in the language of the sermon and prayerbook, was made to understand that it is a violation of orthodox Newtonian theory to assert, as would the materialist, that motion is inherent to matter, and thereby to sever the universe from divine control and deny the providential harmony of the existing social order.³³

I will demonstrate that there is no evidence to implicate the Trustees of Boyle's Lectureship in such a definite Newtonian ethos. Even if there was such an ethos by 1727 (the year of Newton's death) there was not, by any analytically useful definition of the term, a 'Newtonianism' in 1692, the year of Bentley's inaugural series of Sermons and just five years after the publication of the *Principia* (and twelve years before the publication of the more accessible *Opticks*).³⁴

Jacob, Gascoigne, Shapin and Stewart all claim that, irrespective of Boyle's intentions, the sermons were eventually dominated by a moderate Anglican-Newtonian cabal. There are several distinct issues here, the presence of Newtonianism, the control and management of the Lectureship, and the very different vocabularies and practices which distinguish the founding of the Lectureship by Boyle and its subsequent history. These issues will be discussed in chapter 3, but it is worth noting that in the period 1692 - 1715 there are only two series of Sermons (Bentley's and Clarke's) which made any use of Newton's natural philosophy. Yet the fact that Bentley was the first lecturer, that he used Newtonian material in two of his eight sermons in his first year as Lecturer has dominated perceptions of the Boyle lectureship.³⁵ Furthermore, to claim that the Anglican church controlled the

³³ *The Cultural Meaning of the Scientific Revolution*, (New York, 1988) p. 142. Jacob has not shifted from her position set out in the earlier *Newtonians and the English Revolution*. In fact in the later studies the claims are more emphatic and the causal links are more trenchantly maintained. In this quotation, for example, Newtonianism is identified with the attack on materialism.

³⁴ In the chapter on Bentley I will show how he used Newtonian material not from an adherence to a 'Newtonianism', but pragmatically and rhetorically.

³⁵ It is significant that Tenison did not impose a Newtonian programme even when it was within his power to do so. Tenison was anxious to ensure that the management of the Lectureship was in accordance with Boyle's exact conditions regarding the office of Lecturer. See his letter to Evelyn, November 17 1698, Bray, iii, pp. 376 - 77, where he expressed concern over the possibility that they had 'strained Mr. Boyle's words by admitting those who are not city ministers'.

lectureship is analytically meaningless and we will, in chapter 3, have to examine the precise role of the several Trustees.

It is now a commonplace in the History of Science to adopt an interdisciplinary approach and to describe science in its social context.³⁶ However, an analysis of the personal aims of the protagonists, the style, language and content of the texts, and the local scholarly network within which individuals might attain patronage and preferment, can add substantially to our understanding of the relationship between distinct disciplines. Given the diverse nature of the performances in the Lectureship, it is difficult to see how a single determining social programme might have produced such diversity. I suggest that a consideration of factors which affect the lives and practices of *individual* divines, in this period, will assist in explaining the nature of individual performances.³⁷ My disagreement with Jacob and other social contextualists focuses on their readiness to incorporate elements solely on the basis of analogical or morphological similarities. In the following section I outline an analysis which attempts to account for the diversity exhibited by the Sermons. The rhetorical principle of *use* will be my main concern. Allied to this is a concentration on the immediate scholarly context of the individual divine. This approach exchanges the determinism of much of social contextualist studies for the contingencies of scholarly life and the credit which individuals sought within limited scholarly contexts.

1. 2. The *Use* of Materials in a Rhetorical Context.

Recent historiography has highlighted the rhetorical nature of discursive texts. An investigation of rhetoric seeks to determine the *use* to which materials are put within a specific literary performance: it focuses attention on the function which substantive and stylistic elements perform.³⁸ With regard to the Boyle Sermons,

³⁶ For an overview see, Jan Golinski, 'The Theory of Practice and Practice of Theory: Sociological Approaches in the History of Science', *Isis*, 81 (1990), 492 - 505.

³⁷ See J. A. I. Champion, *The Pillars of Priestcraft Shaken: The Church of England and its Enemies, 1660 - 1730* (Cambridge, 1992), for a discussion of the importance to the individual of scholarship and credibility. Compare, H. Kearney, *Scholars and Gentlemen. Universities and Society in Pre-Industrial Britain 1500 - 1700* (London, 1970).

³⁸ There has been an enormous increase in the attention paid to Rhetoric on the part of Historians of Science in the last decade. See, Lawrence J. Prelli, *A Rhetoric of Science: Inventing Scientific Discourse* (South Carolina, 1989); Alan G. Gross, *A Rhetoric of Science* (Cambridge, Mass./London, 1990); G. N. Cantor, 'The Rhetoric of Experiment' in, David Gooding, *et al.*, eds.,

therefore, the presence of Newtonianism, or any natural philosophy, may not signify unconstrained support for a particular system.³⁹ The function of any discursive materials may have been purely agonistic, and only an examination of the particular argumentative strategy will account for its presence. The texts were also highly specific and demonstrate the competence of the chosen divine to carry out an intellectual brief. Furthermore, all the Boyle Lecturers were involved in the production of scholarly materials and were self-proclaimedly members of various scholarly networks. Thus performance in the pulpit or in print had to be worthy of a public engaged in the reading of complex argumentation, and also deemed worthy by the immediate peers of an individual's scholarly network.⁴⁰

For the foregoing reasons the Sermons are treated as contingent responses to the demands of duty and scholarly performance, where theology, natural philosophy, or any discursive material, will be examined on the principle that the Sermons were constructed with a high priority given to rhetorical demands. The aim of the Sermons was both agonistic and persuasive: agonistic in their attack on the irreligious and persuasive in settling the minds of the religious who were conceptually threatened by the systems of anti-Christian thought. A concentration on the function

The Uses of Experiment (1989). On the question of Rhetoric's usefulness as an interdisciplinary tool see Herbert W. Simons, ed., *The Rhetorical Turn: Invention and Persuasion in the Conduct of Inquiry* (1990). There are two very useful surveys of the science and rhetoric literature in, Jan Golinski, 'Contending Rhetorics: The Rhetorical Maelstrom', *Isis*, 84 (1993), 746 - 49, and Carolyn R. Miller, 'Some Perspectives on Rhetoric, Science, and History', *Rhetorica*, 7 (1989), pp. 101 - 14. J. E. McGuire and Trevor Melia express reservations over the application of rhetoric to scientific texts as opposed to those of other disciplines, see 'Some Cautionary Strictures on the Writing of the Rhetoric of Science, *ibid.*, pp. 87 - 99. Alan Gross responded to this critique in, 'Rhetoric of Science without Restrictions', *Rhetorica* 9 (1991), 283 - 99. The standard works on Rhetoric in the early modern period are Wilbur Samuel Howell, *Logic and Rhetoric in England, 1500 - 1700* (New Jersey, 1956), and *Idem.*, *Eighteenth-Century British Logic and Rhetoric* (New Jersey, 1971). Lisa M. Zeitz's, 'Natural Theology, Rhetoric, and Revolution: John Ray's Wisdom of God 1691 - 1704', *Eighteenth Century Life*, 18 (1994), 120 - 33. came too late into my hands to be of any use.

³⁹ The example of Robert Green is worth noting, since his use of Newtonianism was not indicative of wholesale support. See *The Principles of Natural Philosophy, in which is shown the Insufficiency of the present systems, to give us any just account of that science . . .* (Cambridge, 1712), and *The Principles of the Philosophy of the Expansive and Contractive Forces . . .* (Cambridge, 1727). The case of Green demonstrates that it is more productive to highlight the function of Newtonian material (or any natural philosophy) in discursive texts, than to infer, simply from its presence and subsequent success, that its *use* was the result of a Newtonian ideology.

⁴⁰ On preachers and preaching in this period, see Richardson, C. F. *English Preachers and Preaching* (London, 1928); Kempe, J. E. *The Classic Preachers of the English Church* (2 vols., London, 1877 - 78); Mitchell, W. Fraser. *English Pulpit Oratory from Andrews to Tillotson: A Study of its Literary Aspects* (London/New York/Toronto, 1932); Rolf P. Lessenich, *Elements of Pulpit Oratory in Eighteenth-Century England, 1660-1800* (Cologne, 1972). Irène Simon, *Three Restoration Divines: Barrow, South, Tillotson* (Paris, 2 vols., 1967 & 1976).

of rhetoric serves to focus our examination on the *use* to which various texts was put, and on their authoritative status. Therefore, discussion of the context for the texts will be limited to the immediate scholarly environments of the various protagonists. Context is also to be understood as the primary intellectual site from which the Lecturers drew their arguments and strategies. These sites were invariably inherited by the protagonists and they form a scholarly ensemble available to both sides in any dispute. Clifford Geertz's description of 'culture' comes closest to my conception of this ensemble

The culture concept to which I adhere . . . denotes an historically transmitted pattern of meanings embodied in symbols, a system of inherited conceptions expressed in symbolic forms by means of which men communicate, perpetuate, and develop their knowledge about and attitudes towards life.⁴¹

The *use* of material within specific performances serves as the index of an individual's scholarly motivations: the need for patronage, peer approbation and scholarly excellence. Thus the performance of an individual in the Boyle Sermons is not treated according to the notion of an 'evolution' of an individual's thought toward a *terminus ad quem*, or from a *terminus a quo*. For these reasons much more attention is paid to the individual productions in the Boyle Sermons - their polished, published versions which counted toward the accrual of scholarly credit. This approach does not relate the text to a wider social context. In fact the whole 'rhetoric of contextualization', to use LaCapra's term, has often been an excuse to avoid reading the texts and substitute an apparently more accessible situation or context.⁴² There may in fact be some truth in LaCapra's joking aside, that anything which has to be read slowly, or re-read, is considered far too abstract for the historian's needs.

This approach serves to redirect investigations away from the overriding concern with ideological commitment which has dominated the work of Jacob *et al.* I will, however, maintain a working distinction between the foregrounded text and a background which helps to locate the text within the career of the author. Thus it is a central claim of this thesis that an analysis of the *use* to which material was put in

⁴¹ I have benefited from a reading of the following works. Dominick LaCapra, *Rethinking Intellectual History: Texts, Contexts, Language* (New York/London, 1983). Michael Kammen, ed., *The Past Before Us: Contemporary Historical Writing in the United States* (New York, 1980). Anne Goldgar, *Impolite Learning: Conduct and Community in the Republic of Letters 1680 - 1750* (New Haven/London, 1995). The quoted passage is from Clifford Geertz, *The Interpretation of Culture* (New York, 1973), p. 89.

⁴² LaCapra, *op. cit.*, p. 14.

the performance of a particular brief can serve to unite the text to its context more efficiently than offering a simplistic taxonomy into which we squeeze ill-fitting materials. Analytical capital can be made from a close reading of texts, where attention is given to both the manner, or form, and the content of literary works. John Christie describes how

[c]onventional scientific and philosophical reading tends strongly towards discrimination by content. However, to focus on content at the expense of expression introduces another and comparable form of blindness, for the work of expressive mode, language, will tend to go unglimped unless matched by an active reading constantly aware of the textual tactic and strategy which written language always and inevitably embodies.⁴³

It is also important to recognise that the texts analysed in this study were Sermons, produced under an obligation to fulfil a specific brief, and that the Trustees and Lecturers were acting under the constraints of ecclesiastical obligation and duty.⁴⁴ The Trustees had corporate responsibility which empowered them to carry out Boyle's requests. The bequest was immediately assimilated into the long-established practice of dealing with the last will and testaments of virtuous laypersons and their pious endowments.⁴⁵ Just as the brief given in Boyle's will constrained the limits within which the Trustees had to operate, their adherence to the legal and official terms of that brief dictated much of the content of the Sermons given that the defence of Christianity was their primary task. The Boyle Lecturers were *appointed* to their office (as were the Trustees) and the resulting texts may or may not be representative of their *professional orientation*. Bentley, for example, was not a theologian, nor a metaphysician, but a classical critic. Thus his Sermons were of necessity constructed by a reliance on materials over which he did not have a professional competence.⁴⁶ However, his tactical skill in deploying his materials

⁴³ John R. R. Christie, 'Introduction', in Andrew E. Benjamin, Geoffrey N. Cantor, and John R. R. Christie, eds., *The Figural and the Literal: Problems of Language in the History of Science and Philosophy 1630 - 1800* (Manchester, 1987), pp. 2 - 3.

⁴⁴ This is evident from the overtly doctrinal nature of many of the Sermons. Turner, for example, defended the necessity of Christ's propitiatory sacrifice against Blount's attack on the doctrine of the Redemption in his *Oracles of Reason* (London, 1693). The majority of the Boyle Lecturers responded by proving the necessity for revealed doctrine against the claims of the Deists that 'natural religion' was the only necessity for instructing humanity in its duties and obligations toward God.

⁴⁵ John Addy, *Death, Money and the Vultures: Inheritance and Avarice, 1660-1750* (London/New York, 1992).

⁴⁶ Thus Bentley's correspondence with Newton is not comparable to his correspondence with

ensured his further preferment. The gift of the actual office of Boyle Lecturer was therefore an opportunity to demonstrate the intellectual credit which a divine could bring to bear on particular issues. It was a recognition of one's status in a scholarly network as well as the gift of future scholarly recognition. Ann Goldgar, relying on the anthropological studies of Malinowski and Marcel Mauss, argues that patronage and the exchange of scholarly favours had as its object the furtherance of an 'amicable sentiment' (Mauss' term) between the persons involved.⁴⁷ The exercise of scholarly patronage could be seen as strengthening the relations of members of the Republic of Letters rather than ensuring institutional homogeneity, or signifying the obsequious gestures of a disciple toward a master. Goldgar, in order to expand on the concept of scholarly association, utilises Lévi-Strauss's concept of the social bond where each social gesture proliferates a network of oscillating ties.

This exchange of service for service, book for book, friendship for friendship, thus made of the practical necessities of learned life a true bond between scholars. Not only would a person obtain the tools of scholarship, but in doing so he would forge ties of mutual assistance with other people in his position. These ties, moreover, could branch into an extensive network of connections available to provide information and help of all kinds. Thus the ideal of reciprocal service, alongside the logistical encounters and common ideology of scholars, lent greater reality for its citizens to the invisible institutions of the Republic of Letters.⁴⁸

Goldgar's study focuses a great deal of attention on scholarly practice, and the protocol of the literary community. This is a salutary departure and can be especially serviceable in dealing with the immediate scholarly context of the Lectureship. What we find, in the case of the Boyle Lecturers, is that position in the scholarly community, the furtherance of careers and the need to fulfil duty and obligation played a much more significant role than an interpretation based on ideological factors permits. We need to focus on more local and contingent aspects of individual careers and scholarly performance. Bentley was not selected solely on

Graevius his fellow classicist: in the latter case he was operating within his professional domain. On Bentley's status as a classical critic, see C. O. Brink, *English Classical Scholarship: Historical Reflections on Bentley, Porson, and Housman* (Oxford, 1985).

⁴⁷ See Goldgar, *op. cit.*, p. 19. Bruno Latour's *Science in Action* (Cambridge, Mass., 1987), offers a microscopic analysis of the rhetoric of contingent decision-making. My own approach attempts a similar concentration on scholarly networks. It is not group specific, since the need to establish a career and the maintenance of scholarly credit was common to all learned groups in the period. The ability to be of use to colleagues placed a scholar in a position of power, not only because these services might be reciprocated, but also because such an ability enhanced credibility and demand.

⁴⁸ Goldgar, *op. cit.*, p. 26.

the basis of his Anglicanism: his growing reputation within the European community of letters and his position within the Stillingfleet household, where he had the scholarly support of his prestigious employer Stillingfleet, were contributing factors in Bentley's selection.⁴⁹

Scholarly acts could also incorporate themselves into what Langford calls 'the pressures of a divided, competitive, and vigorous property-owning society, given to commercial combat at every opportunity.'⁵⁰ Thus the production of scholarly materials can perhaps be envisaged as the product of the forces of competition, credit and vigorous place-seeking. The tensions generated by these apparent oppositions are particularly revealing within a community, whose literary behaviour tended to downplay these rather mercantile images, where the ready cash-in-hand of scholarly competence was crucial in providing the wherewithal which gave competing divines purchasing power in attaining patronage and thereby preferment. However we ought to exercise caution in judging all scholarly productions as merely the response to the demands of securing position: it was not all place-seeking, driven by 'individual possessivism': duty and piety could co-exist and be served by means of scholarly integrity. This had important individual and institutional resonances.

The dangers of subsuming ecclesiastical practice under the umbrella of self-interest has received extensive criticism in the work of the revisionist historian J. C. D. Clarke. For example, he criticises the depiction of early modern divines as interested only in the spoils of office and impervious to reformation: citing Christopher Hill's as the paradigm case of those studies which represent early modern agents from a present-centred position.⁵¹ The secularised and fragmented perspective of some historians fails to capture the urgency with which divines - from a sense of duty and piety - answered their critics, and very often as a necessary

⁴⁹ John Harris's selection also resulted from his location within a scholarly network. His support of Woodward in the natural history debates extended his scholarly credit within the area of those who supported the development of 'modern' sciences against a reliance on the authority of the ancients. In his Boyle sermons Harris, drew philosophical support from the moderns, Locke and Descartes, in order to contrast the systems of the atheists, Hobbes Blount and Spinoza, as a mere recapitulation of the defunct opinions of the ancients. As we will see in chapter five, Newton played no part either in Harris's selection, or in his Sermons.

⁵⁰ See Paul Langford, *Public Life and Propertied Englishmen, 1689-1798* (Oxford, 1990), p.186.

⁵¹ For a critique of present-centred historiography, see Adrian Wilson, 'Whig History and Present-Centred History', *Historical Journal* 31 (1988), pp. 1 - 16; T. G. Ashplant and Adrian Wilson, 'Present-Centred History and the problem of Historical Knowledge', *op. cit.*, pp. 253 - 74.

adjunct of the desire to live a pious Christian life.⁵² According to Hill, Walpole's era was one of, 'spiritual desolation as men contemplated the barren mechanical universe of Newton, and the new dismal science of economics...Warmth and social solidarity were what was lacking in this atomised and individualised society'.⁵³ It is this very characterisation, relying as it does on the analogies between social order/disorder and the atomist view of the material world, which is the motive force behind Jacob's analysis of the Boyle Lectureship. The lectureship, is depicted as the Anglican Church's mechanism to control this state of 'possessive individualism' and atomistic self-serving, given that it was already a fact of economic and social life by the 1690s.⁵⁴ Would any period in the history of Christianity's fight against sin and corruption not exhibit within its texts the language of virtue and piety set in opposition to a language of self-interest and worldly pursuit? There is, therefore, nothing significant in the *de facto* presence of such language. A more pertinent and fruitful question to ask of the Boyle Lectures is, in what way and by means of which materials did divines construct their prosecution of Boyle's 'notorious infidels'?

Although there is no single overarching theory which will explain the scholarly performance in the Boyle Lectureship, the notion of 'credit' located within the nexus of the community of letters serves to organise these elements I have introduced in this section. It is probably unnecessary to reiterate the maxim 'knowledge is power'. However, it is particularly applicable in the case of the Boyle lecturers, where 'power' was the accumulation of scholarly credit. This 'credit' found 'ready cash' in exchanging the power of knowledge for preferment and position.⁵⁵ It is not intuitively obvious that place-seeking, scholarly integrity, piety and virtue are contradictory qualities. Moreover, these concepts found textual expression within a culture where they operated according to protocol and were

⁵² For a recent survey of the 'revisionist' approach which attempts to relocate religion as a principle motivating factor in political and scholarly practice, see, Susan Rosa, 'Religion in the English Enlightenment: A Review Essay', *Eighteenth Century Studies*, 28 (1994), 145 - 9. The works which Rosa reviews have - for the most part - abandoned the teleological focus on Deism, secularisation and 'reason', and have acknowledged the importance of faith and mystery in Anglican divinity.

⁵³ Christopher Hill, *Reformation to Industrial Revolution* (London, 1967), p.63, quoted in J. C. D. Clarke, *English Society 1688-1832: Ideology, Social Structure and Political Practice during the Ancien Regime* (Cambridge, 1985), p.6.

⁵⁴ On this notion, see C. B. Macpherson, *The Political Theory of Possessive Individualism: Hobbes to Locke* (Oxford, 1962).

⁵⁵ Champion, *op. cit.*, esp. pp. 44 ff.

subject to continual scrutiny.

In dealing with the texts of the Boyle lectures my approach requires that each performance be treated independently.⁵⁶ This approach avoids making assumptions as to the pertinent issues already in operation before historical interpretation begins. I also use this approach to counteract the assumption that theological language simply stands alone and can be unproblematically ‘read off’ and identified with a preconceived institutional reification. The fundamental question, particularly of agonistic texts such as the Boyle Sermons, is what function any particular cognitive or stylistic aspect performs. This question serves to focus our attention on the presence of materials taken for granted, or in some cases simply not seen, by investigators who are looking for instantiations of ideological leanings and servitude to institutional power-knowledge dynamics. The Boyle Sermons provide a series of fairly autonomous legal prosecutions: thus in any particular case the need to achieve victory, a successful prosecution and all that it entails, placed great demands on the effectiveness of materials. Although I focus on the published versions the performances have their origin in a purely oratorical context. Divines were provided with a legal brief to identify the crime of irreligion and to expose all materials which might be produced in its defence as fraudulent and without philosophical foundation. Thus if there is a common thread running through the Sermons it is the charge of infidelity and the concomitant defence of Christianity.

The purpose of the Lectureship was to combat atheism and other threats to Christianity *per se*.⁵⁷ This constant threat was in itself sufficiently pressing to command the full exploitation of the defensive potential of the Sermons. Boyle’s brief to the Trustees demanded an *overt* defence against the irreligious. This request was not carried out (it had no need to be) by means of a hidden agenda, or sub-text. In the time-honoured defence of orthodoxy based on the vocabulary of ‘order versus chaos’, atheism was perennially treated as synonymous with chaos and by definition without form or order either personal or social.⁵⁸ This defensive programme was

⁵⁶ See LaCapra, *op. cit.*, p. 30.

⁵⁷ Divines often represented the enemy as essentially corrupt and guilty of the misuse of scholarly materials for selfish interests. Although the lecturers dealt with their opponents in terms of shared discourses their arguments were constructed on a foundational maxim which asserted orthodoxy’s inherent and proprietorial right to those materials.

⁵⁸One of the main difficulties in analysing the use of science in theological literature is to highlight

undertaken independently of other ventures carried on by the Anglican Church in its desire to keep order, to maintain its powerful political and social position, and to carry out its theological responsibilities under fluid political conditions.

A principal aim of this thesis is to establish the precise strategic use of natural philosophy within a context where victory was a primary motivation for deploying materials. It is this practice which the term 'rhetoric' is intended to cover. Rhetoric is concerned with the study and practice of persuasion: Aristotle defined it as 'the faculty of observing in any given case the available means of persuasion'.⁵⁹ Furthermore, a rhetorical analysis demonstrates that the content - particularly of a sermon - may be partly, or fully, determined by the specific occasion. The audience for any discursive performance must share the terms and stylistic commonplaces of the orator. Prelli has this to say regarding the importance of shared vocabularies:

Linguistic choices request that an audience accepts the terms we think are appropriate, together with their concomitant beliefs and values. There is nothing insidious about this . . . All users of language are preachers insofar as their choices of words bring into view the values, meanings and purposes that they desire.⁶⁰

To demonstrate that there are much more productive and context-sensitive ways of treating the performances of lecturers, who have been singled out as representative of a Newtonian cabal, I have chosen to examine the sermons of Richard Bentley, John Harris and Samuel Clarke. I have not concentrated on two divines normally included in the Newtonian group - William Whiston and William Derham. Whiston's sermons are so specific in their aim that I could not, without a long digression into biblical exegesis on prophetic texts, discuss the details of his performance. His sermons dealt extensively with hermeneutics: arguments between Christian and Jewish exegetes containing nothing relating to Newton's principles or natural philosophy of any form. Derham's 'sermons' in their published versions constitute a sizeable textbook on natural history and was probably published with the intention of having it accepted within the university curriculum. In the preface, Derham apologises for the lengthy footnotes and expresses his hopes that 'the most

what is novel and what is commonplace. Due to the ever-changing nature of the attacks on Christianity this becomes a pressing issue. Thus questions of who, when, and where, must be given prominence in an analysis of oratorical defence.

⁵⁹ Aristotle, *Rhetoric*, 1. 2. 27, in Jonathan Barnes, ed., *The Complete Works of Aristotle* (2 vols., New Jersey, 1984), ii, p. 2155.

⁶⁰ Lawrence J. Prelli, *op. cit.*, p. 16.

of them may be acceptable to young Gentlemen at the Universities, for whose Services these Lectures are greatly intended.⁶¹ Furthermore, Derham supplies most of his technical materials in these lengthy footnotes - similar to the style of Clarke's *Rohault* - and although the published text resembles the Sermons delivered in the pulpit, the importance of the notes and Derham's ambitions alters the significance of his *Physico-Theology*. Thus a commentary on his text would effectively be a commentary on the state of natural history in the period.⁶² The topics presented by the vast majority of the Boyle Lecturers covered the full range of central Christian doctrines which were often defended against particular individuals. Topics included the Incarnation - the necessity for a mediator between man and the absolute need for a propitiatory sacrifice - exhortations to piety and virtue, defences of prophecies, arguments for free will, and defences of the miraculous status of Holy Scripture. Moreover, the one continuous thread, which runs through the whole period, was the constantly reiterated dogma that piety and virtue cannot subsist independently of a revelation and subsequent reformation in the human soul.⁶³

In the following chapters I will show that the Boyle Sermons were individual performances which conformed closely to Boyle's brief. There was a corporate entity, the Boyle Lectureship, but this must not be conflated with the Sermons nor with the decisions of the Trustees. Whilst the enemies of Christianity were a corporate responsibility, the focus for that responsibility was, in this case, Boyle's last will and testament. However, the Anglican church already had at its disposal the

⁶¹ Derham was not particularly indebted to Newton. Although Derham calls him 'my most ingenious Friend, the Great Sir Isaac Newton', the use of Newtonian natural philosophy is limited to a few references to the *Optics* (1704) and Newton's paper on heat in *Philosophical Transactions*, no. 270 (1701) - this is Newton's 'Scala graduum Caloris', see I. B. Cohen ed., *Isaac Newton's Papers and letters On Natural Philosophy* (Cambridge, 1958), pp. 259 - 64. In Derham's section 'Of Gravity' he cites the *Principia* and praises its 'rational Philosophy', but regards this power as innate to matter, regardless of Newton's disclaimers, see Letsome and Nicholl, *op. cit.*, p. 572, note a. Derham is much more indebted to the work of Hooke, Ray, Woodward, Tancred Robinson and others - both contemporary and classical - in the natural history genre. See 'To the Reader', Letsome and Nicholl, *op. cit.*, iii, mispaginated.

⁶² On Derham, see A. D. Atkinson, 'William Derham, F. R. S. (1657-1735)', *Annals of Science*, 8 (1952), 368 - 92.

⁶³ This topic was so important that it formed an introduction to Cumberland's work on natural law. Richard Cumberland, *A Treatise of the Laws of Nature to which are prefix'd, An Introduction, concerning the Mistaken Notions the Heathens have of the Deity, and the defects in their Morality, whence the usefulness of Revelation may appear . . . made English from the Latin by John Maxwell* (London, 1727).

institutional and scholarly wherewithal to set in motion Boyle's brief, and did not have to develop new mechanisms in order to do this: the incorporation of novel materials into oratorical strategy lay with the distinctive scholarly practice of chosen Lecturers. Thus there is no inherent substantive continuity between Boyle, and the Lecturers Bentley, Harris and Clarke. It will, therefore, be necessary to fragment the historical category 'Boyle Lectures' into several distinct but related interpretative threads. In the following chapter I relate the circumstances of Boyle's decision to establish the Lectureship: there I focus in particular on Boyle's personal piety and his recognition of the threat to weak Christians from alternative religious and philosophical systems. Chapter three focuses on the Trustees, and argues that their subsequent representation as supporters of a Newtonian venture has failed to consider the fragmentary nature of this group. Chapters four, five and six offer a detailed reading of the Sermons, highlighting the distinctive content and methods of Bentley, Harris and Clarke. In reading the Sermons I have tried to elucidate how novel and traditional materials functioned in the overall argument of each divine. Natural philosophy was highly novel material especially in the pulpit. Thus it is very important that we understand its strategic function in confuting the enemies of Christianity. This may go some way towards refining our interpretations of the relationship between science and religion in the early modern period.

Chapter Two

The Piety of a Christian Virtuoso: Robert Boyle's Will and Acts of Holy Living.

2. 1. 'Holy-Life': A Representation of Boyle's Spirituality.

This chapter begins the process of fragmenting the Lectureship into its various components in order to avoid the casual incorporation of the Lectureship within a deterministic sociology, and also to avoid reducing distinct contingencies to ideological necessity. The brief in Boyle's will, specifying the conditions of the bequest, did not mobilise those involved in the Lectureship within the boundaries of a coherent programme. Consequently, the term 'Boyle's Lecture' is strictly applicable only to Boyle's inauguration of the Lectureship. This nominalist stance is necessary especially as I will show that Boyle intended to oversee the Lectureship himself. Furthermore, there are no grounds, aside from terminological usefulness, for conflating the three main divisions of the Lectureship - Boyle's bequest, the actions of the Trustees and the performances of the Lecturers - under a single rubric.

The chapter is divided into four sections. In this section I examine diverse characterisations of Boyle's spirituality.¹ Alternatively, I argue that it was Boyle's experiential piety which motivated his desire to assist in the promotion of a learned defence of Christianity. Secondly, I describe how the founding of the Lectureship was the natural outcome of his lifetime of pious scholarship. It was his spirituality which provided the understanding that natural philosophy was not inimical to the classical Christian humanist qualities of piety and virtue.² These paradigmatic

¹ I have chosen the term 'spirituality' in preference to 'religion' or 'theology' as it signifies the practical nature of Boyle's Christianity. Michael Hunter uses the term 'religiosity' in, 'The Conscience of Robert Boyle: Functionalism, "dysfunctionalism" and the Task of Historical Understanding', in, *Renaissance and Revolution: Humanists, Scholars, Craftsmen and Natural Philosophers in Early Modern Europe*, eds., J. V. Field and F. A. J. L. James (Cambridge, 1993), pp. 147 - 59.

² For an example of Boyle's Christian humanism see his letter to Francis Tallents, February 20 1647, *Works*, vol. i, p. xxvi. Birch comments on Boyle's early skill in the 'epistolary style' - a typical humanist enterprise - evidenced by his letter to Lady Ranelagh, *ibid.*, p. xxvii. See also

Christian qualities enabled his scholarly work to function primarily as an act of devotion. Consequently, the bequest is presented as the outcome of Boyle's life-long preoccupation with 'Holy-Living'.³ Thirdly I examine the contents of the codicil relating to the Lectureship and provide a detailed interpretation of Boyle's brief. The final section analyses Boyle's list of 'notorious infidels' so as to highlight the relationship between those listed and Boyle's personal encounters with anti-Christian systems.

The scholarly industry on Robert Boyle has produced various accounts of the interactions between his natural philosophy and his personal spirituality.⁴ Moreover, as the main claim of this chapter rests on the argument that Boyle's charitable bequests were an extension of his personal piety and virtue, it is also necessary to examine contemporary expressions of what constituted a pious life. In contrast to many of the prevailing studies of Boyle's spirituality, I offer an approach which treats such expressions non-reductively. Thus, personal pious behaviour and its literary expression in contemporary vocabularies will not be reduced to alternative discourses. This location of Boyle's spiritual practice prioritises his enunciation of a

Works, vi, the Hartlib - Boyle letters and the Evelyn - Boyle letters - esp. p. 291 where Evelyn writes in hyperbolic terms on Boyle's *Seraphic Love* (1660).

³ Recent scholarship on Boyle supports this interpretation. The works of Michael Hunter, John Harwood and Malcolm Oster have enlarged our understanding of Boyle's theological and devotional concerns. Furthermore - serving to enhance our understanding of Boyle as humanist - there has lately been an increasing awareness of his non-scientific writings and of his literary practice in general. On Boyle's non-scientific writings see Lawrence M. Principe, 'Style and Thought of the Early Boyle: Discovery of the 1648 Manuscript of *Seraphic Love*', *Isis*, 85 (1994), 249 - 60. These studies have provided the essential background for the close reading of Boyle's will which forms the substance of the third section of this chapter.

⁴ There is very little work on Boyle's spirituality *per se*. The following list is only representative and some of the works cited deal with Boyle's religion as an adjunct of a more prioritised discourse: D. A. Beck, 'Miracles and the Mechanical Philosophy: the Theology of Robert Boyle in its Historical Context', PhD thesis (University of Notre Dame, 1986); Harold Fisch, 'The Scientist as Priest. A Note on Robert Boyle's Natural Theology', *Isis*, 44 (1953), 252 - 65; M. S. Fisher. *Robert Boyle, Devout Naturalist* (Philadelphia, 1945); R. M. Hunt, *The Place of Religion in the Science of Robert Boyle* (Pittsburgh, 1955); the work of Michael Hunter has proved to be invaluable and is cited throughout this study; James R. Jacob. *Robert Boyle and the English Revolution: A Study in Social and Intellectual Change* (New York, 1977); E. M. Klaaren, *Religious Origins of Modern Science: Belief in Creation in Seventeenth-Century Thought* (Grand Rapids, 1977); J. G. Lennox. 'Robert Boyle's Defence of Teleological Inference in Experimental Science', *Isis*, 74 (1983), 38 - 52; Malcolm Oster, 'Nature, Ethics and Divinity: the Early Thought of Robert Boyle', D.Phil. thesis (University of Oxford, 1990); Timothy Shanahan, 'God and Nature in the Thought of Robert Boyle', *Journal of the History of Philosophy*, 26 (1988), 547 - 69; R. S. Westfall, *Science and Religion in Seventeenth-Century England* (Ann Arbor, 1973); H. Yoshimoto, 'Science and Religion in the Thought of Robert Boyle', *Kagakusi Kenkyu*, 23 (1984), 193 - 200.

practical Christianity in terms drawn from the enormously rich vocabularies of seventeenth-century devotional literature.

Although Boyle's diverse literary forms were often constructed from inherited materials, the fact that such discourses were inherited did not prevent him, along with many others in this period, from recombining and inventing suitable literary responses to exigent demands. For example, our understanding of the manner in which he responded to the demand for a suitable form of literary expression to articulate his pious involvement in natural philosophy, can be enhanced by taking seriously the prevalence of the seventeenth-century language of 'experiential' or 'solid' piety.⁵ This focus should correct the tendency (prevalent even in studies which are sympathetic to theological discourse) which characterises Boyle's holy life as an interaction between two distinct spheres - theology (or religion) and natural philosophy. The presence of this ubiquitous dichotomy has engendered an unnecessary fragmentation of Boyle's thought and practice. Furthermore, I will also argue that his perception of the need for 'proofs' of Christianity against the attacks of 'notorious Infidels' was not a demand for a rational theology supported by scientific findings, but stemmed from the certainty and groundedness of a solidly-based Christianity.⁶ It is this aspect of Boyle which motivated his endowment of the lectureship.

The work of Michael Hunter has done much to re-evaluate perceptions of Boyle's spirituality. In a useful overview he divides the mass of commentary on the

⁵ John Spurr disputes the standard comparison of Anglican 'lukewarmness' with Nonconformist fervour. He insists that the 'context of . . . Anglican works of sober morality needs to be reinstated . . . into the rigorous Anglican theology of salvation and the pious regime of penitence, prayer and sacraments . . .'. See John Spurr, *The Restoration Church of England, 1646 - 1689* (New Haven/London, 1991), p. 374. It is this context which I refer to by the terms 'experiential' or 'solid' piety. As Spurr argues, the Restoration church may not have condoned 'heart religion' or enthusiasm but it was wholeheartedly directed to a programme of practical devotion. Graham Parry makes a passing reference to Jeremy Taylor's encouraging Evelyn's "progression in religion". Taylor observed, in late 1659, that Evelyn had now 'entered into the experimental and secret way of it'. Quoted in, 'John Evelyn as Hortulan Saint', in Michael Leslie and Timothy Raylor, eds., *Culture and Cultivation in Early Modern England: Writing and the Land* (Leicester/London, 1992), p. 139.

⁶ In his biography of Boyle, Birch gives a list of manuscripts which he has not included in the published volumes. In the 'theology' section we find the following apposite titles: 'Considerations about some of the Causes of Atheism'; 'Four Conferences about as many grand Objections made by Philosophical Wits against the Christian Faith'; 'An Invitation to endeavour the Conversion of Infidels, to which is annexed the good Offices Revelation does to Reason'; and 'A short Discourse, showing that the great Diversity of Religions ought not to stagger a wellgrounded Christian.' See Boyle, *Works*, i. I discuss the importance of the terms 'stagger' and 'groundedness' below.

relationship between Boyle's natural philosophy and other discourses into two contrasting traditions. The first he describes as the 'intellectualist' or 'internalist' strand, epitomised in the work of Marie Boas Hall, which asserts that the search for truth and cognitive certainty is independent of context. In this tradition Boyle is seen to have devoted himself to

refashioning knowledge about the natural world along corpuscularian and anti-scholastic lines, his motivation taken to be an altruistic pursuit of scientific theories which would be internally coherent and compatible with his theological and philosophical commitments.⁷

The other major strand is constructed by those investigators who stress the need to locate Boyle's aims and goals within wider social and political programmes. The sociological approach seeks to reduce Boyle's piety to an expression of political exigency. He is portrayed as someone acting under the auspices of entrenched institutions simply to curtail the proliferation of competing forms of knowledge. Exemplary work in this area has been carried out by J. R. and M. C. Jacob, Steven Shapin and Simon Schaffer.⁸ A general claim of the sociological interpretation, views Boyle as consciously and deliberately

promoting a public image of himself with a political purpose, emphasising his independence, probity and piety as a means of establishing his credentials as a polemicist, and hence helping to solve the problem of order to which conflicting claims otherwise gave rise.⁹

Hunter argues that both approaches share a common methodological assumption - an essential 'rationalism' which results in the reduction of theological discourse to rationally pursued aims derived from a governing discourse such as politics or economics.

Perceiving that reductionism is particularly prevalent in the treatment of

⁷ Michael Hunter, 'The Conscience of Robert Boyle', p. 147. The rational and mechanistic explanations are well represented in Marie Boas Hall's, *Robert Boyle on Natural Philosophy* (Bloomington, 1965), and also in her 'The Establishment of the Mechanical Philosophy', *Osiris* 10 (1952), 412 - 541. A similar stance is taken in the more recent work of Timothy Shanahan, 'God and Nature in the Thought of Robert Boyle', *J. Hist. Phil.*, 26 (1988), 547 - 69 and Rose-Mary Sargeant, 'Scientific Experiment and Legal Expertise: the Way of Experience in Seventeenth Century England', *Stud. Hist. Phil. Sci.*, 20 (1989), 19 - 45. In her monograph on Boyle, *The Diffident Naturalist: Robert Boyle and the Philosophy of Experience* (Chicago, 1995), Rose-Mary Sargeant divides the mass of work on Boyle into 'intellectualist' and 'contextualist' strands and provides a valuable overview of the various attempts to characterise Boyle's thought - see pp. 2 - 11.

⁸ For a more detailed discussion of this type of approach see Chapter One of this thesis and the works cited there.

⁹ Hunter, *op. cit.*, p.148.

theological discourse, Hunter attempts to define the object of certain forms of theological language particularly relevant to Boyle's own concerns. Yet Hunter is not completely free from a reductionist tendency as he identifies the 'missing dimension of Boyle', not found in either of the two major historiographical traditions, with the 'irrational' or 'unintentional'. Hunter describes his own interpretative position as 'teetering on the brink of psychoanalysis', while remaining 'agnostic' about the approach of using Freudian techniques on a long-dead figure. Thus although he avoids the 'functionalist' approach and deals with forces which Boyle may not always have had under control, his application of the term 'dysfunctional', when applied to Boyle's pious behaviour, cannot escape obvious pejorative connotations. In his concluding remarks he explains that although the term may 'jar with some readers' its usefulness lies in its ability

to illustrate the limitations of any interpretation of Boyle which picks and chooses among different facets of his life and thought, as is arguably the case with both the internalist and the social functionalist approaches to him.¹⁰

However, in his analysis of the 'missing element' of Boyle's spirituality he makes very little use of the language of psychotherapy and deals instead with Boyle's use of the immensely rich vocabularies of Puritan and Anglican spirituality¹¹ Thus, according to Hunter,

Boyle needs to be placed in the context of the tortured spirituality exemplified by works like John Bunyan's *Grace Abounding to the Chief of Sinners* (1666) and classically depicted by William Haller in *The Rise of Puritanism* (1938).¹²

As an attempt to gain access to Boyle's pious behaviour I will focus on a central term in Hunter's study - 'anxiety'. Whereas Hunter's tentative application of a psychological approach reduces Boyle's spiritual concerns to the status of 'anxieties', I wish to approach them *sui generis*. Although the casuistic manuals of

¹⁰ *Ibid.*, p.159.

¹¹ Hunter, *ibid.*, p.148, fn. 4, discusses his reservations on the propriety of using the terminology of 'modern psychotherapists', commenting that he would not like to 'push it too far'. He admits that within 'a scheme of otherworldly values, Boyle's views may have had a clear rationale'. My approach is to take that 'otherworldly' scheme at face value. See also Hunter's 'Introduction' to *Robert Boyle by Himself and his Friends: with a Fragment of William Wotton's Life of Boyle* (London, 1994), pp. ix - c.

¹² Hunter, *op. cit.*, p. 149. William Haller, *The Rise of Puritanism: Or, The Way to the New Jerusalem as Set Forth in Pulpit and Press from Thomas Cartwright to John Lilbourne and John Milton, 1570-1643* (New York/Evanston/London, 1938).

this period were intended to deal with the ‘anxieties’ of troubled Christian consciences, the historian must bear in mind that the term ‘anxious’ did not carry the same meaning as current psychological theorising. Boyle’s recourse to ‘confessors’, to resolve his spiritual and ethical difficulties, was characteristic of his contemporaries who sought solace by means of personal confessors.

In considering the remarks of Boyle’s confessors that Boyle might have been somewhat over-scrupulous regarding his own conscience, Hunter regards them as adequate signs that the term ‘anxiety’ can be understood in our modern sense. However, it may be significant that the comments of Boyle’s confessors were made during a period of acute concern with conscience - particularly on the matter of oath-taking.¹³ Furthermore, as Hunter remarks, Anglican spirituality had also changed since the early period of Boyle’s life when the discourses of Anglican and Puritan devotion were perhaps closer in style and content.¹⁴ Although the style of Anglican spirituality had altered by the 1680s, I maintain that Boyle’s search for an ‘experimental religion’, which would ground and secure piety from the onslaughts of internal and external enemies, retained its locus in an earlier devotional literature. The use of the term ‘experimental’ is not as incongruous as it might appear. Boyle very often used the term ‘experimental’ in treating theological matters. His call for an ‘experimental knowledge of God’s wisdom, and other attributes’ and his reference to God’s supernatural intervention in human affairs (miracles) as ‘divine Experiments’ seem an apt illustration here, as is his view that it required ‘a man’s own experience’ to discover the ‘excellency, satisfactoriness, and the advantageousness of those graces and virtues, that are recommended by Christianity’.¹⁵ Consequently, unless there are sound historiographical reasons for

¹³ Michael Hunter, ‘Casuistry in Action: Robert Boyle’s Confessional Interviews with Gilbert Burnet and Edward Stillingfleet, 1691’, *Journal of Ecclesiastical History*, 44 (1993), 80 - 98. An explanation of the importance of the dates of the material, for an understanding of the Anglican response to Boyle’s ‘anxieties’ as being ‘over-scrupulous’, is offered below.

¹⁴ Edmund Leites explains how the ‘cases of conscience’ literature, produced by English Protestants peaked in the first sixty years of the seventeenth century. By the early decades of the eighteenth century it was, Leites argues, ‘no longer an important force in the religious, intellectual, and moral life of Protestant England’. See Leites, ‘Casuistry and Character’, in Edmund Leites, ed., *Conscience and Casuistry in Early Modern Europe* (Cambridge, 1988), p. 119.

¹⁵ See *Appendix to the Christian Virtuoso Part Two* (1691).

accepting current reductionist accounts of the piety of former times there is no basis for not dealing with Boyle's piety in its own terms.

Boyle's early encounter with conversion, as recorded in the autobiographical *Philaretus*, was the basis for his later position on the need to 'ground' spiritual beliefs in an experiential process of 'right reasoning'. This form of acquiring spiritual certainty has too often been associated with the more radical Puritans of the seventeenth century. As Owen Watkins has shown the practice was not, however, necessarily confined to Puritan pastoral care. Furthermore, it is difficult to determine which elements of the vocabularies used to describe autobiographical conversions came from which traditions.

Many people who were not Puritans were 'of a strict and holy conversation' and tried to live a sober and godly life. . . there were certain values which, without being exclusively Puritan, were given special emphasis in [spiritual autobiographies].¹⁶

Boyle carried with him the fundamental belief, expressed most forcefully in the Puritan devotional literature of the period (although not exclusively), that each individual could obtain a personal and active encounter with God, and that this encounter provided a solid foundation which supported all activities of everyday life. Alan Cromartie, for example, describes Matthew Hale's concept of 'true religion', as that which 'transfigured the duties of everyday life'. Cromartie cites a passage from Hale which could have easily come from Boyle's pen.

This is the great art of Christian chymistry, to convert those acts that are materially natural or civil into acts truly and formally religious; whereby the whole course of this life is both truly and interpretively a service to Almighty God, and an uninterrupted state of religion . . .¹⁷

Moreover, Boyle's constant use of the passive voice in describing experiments, the endless self-reflection on his literary style and his efforts to attain certainty in spiritual matters may all be seen as echoing the vocabularies of confessional and devotional

¹⁶ Owen C. Watkins. *The Puritan Experience* (London, 1972), p. 53. It is also interesting that many of the spiritual autobiographies which Watkins describes speak of a childhood conversion. - Boyle was fourteen when he underwent his. Another interesting detail in Boyle's autobiography refers to the stealing of fruit (echoing Augustine's heinous crime of orchard robbing recorded in his own autobiography, *The Confessions*. Watkins comments, humorously, 'The number of robbed orchards which figure in Puritan confessional writings probably reflects the normal activities of boyhood rather than the special example of Augustine'. *Ibid.* p. 59.

¹⁷ Alan Cromartie, *Sir Matthew Hale 1609 - 1676: Law, Religion and Natural Philosophy* (Cambridge, 1995), p. 173. See Hale, *Works*, ii, p. 246.

literature, with their powerful self-referencing imagery and the concomitant intention of drawing the reader into the picture.¹⁸

Among the most popular works of seventeenth-century devotional literature were Jeremy Taylor's *The Rule and Exercise of Holy Living* (1650) and *The Rule and Exercise of Holy Dying* (1651); Michael Sparke's *The Crums [sic] of Comfort* (1623); John Cosin's *A Collection of Private Devotions*; and Lancelot Andrews's *Preces Privatae* (posthumously published in 1648). The popularity of this literature in the period can be seen from the success of Lewis Bayly's *The Practise of Pietie: directing a Christian how to Walke that he may please God* which had its fiftieth edition in 1673. The most renowned of all was *The Whole Duty of Man* (1658) - first published anonymously but now known to be by Richard Allestree. The most renowned of the specifically Puritan works were William Ames's, *Conscience with Power and the Cases Thereof* (1643) and *The Marrow of Sacred Divinity* (1642), along with the works of William Perkins and, later in the century, the works of Richard Baxter. These are only some of the devotional works published by English authors to which must be added a large influx of Catholic continental treatises widely read by Protestants.¹⁹

Many of the topics covered by these works were devotional and ethical commonplaces and many of them are present in Boyle's scientific and non-scientific writings.²⁰ Whilst it is not the purpose of this section to trace Boyle's intellectual

¹⁸ Admittedly, this is speculative. However, treating Boyle's style as constructed solely in order to purvey the 'experimental life' disregards Boyle's self-perception as an author. The monocausal interpretation of Boyle's style by Shapin and Schaffer, for example, ignores the complex way in which cultural reservoirs are drawn on to establish self-identity. For example, his remarkable use of similitude - to insinuate difficult material into the imagination - was not only indicative of the desire to represent experiential activity. The strategic deployment of metaphor and analogy were not features of an experimental or scientific style, and were derived from much more traditional sources. See, Boyle's *The Christian Virtuoso*, 'Preface' (1690) where he comments on his reasons for the extensive use of 'Similitude, or Comparisons': he describes them as 'not always bare Pictures and Resemblances; but a kind of Arguments [sic]'. For further discussion of this issue see Robert Markley, *Fallen Languages: Crisis of Representation in Newtonian England, 1660 - 1740* (Ithaca/London, 1993), esp. pp. 109 - 16.

¹⁹ There is a brief overview of this literature in the 'General Introduction' to P. G. Stanwood's edition of Jeremy Taylor's *Holy Living and Holy Dying* (2 vols., Oxford, 1989).

²⁰ Some of his early ethical writings have recently been published by John Harwood. See, *The Early Essays and Ethics of Robert Boyle*, edited and annotated by John T. Harwood (Carbondale/Edwardsville, 1991). If Harwood is correct in his claim, that the library catalogue compiled by John Warr (Boyle's amanuensis) is a partial catalogue of Boyle's library, then there is the added interest of the enormous number of Puritan works contained in that catalogue. See pp. 249 - 281 for the library catalogue. Steven Shapin has written a sympathetic and perceptive review

lineage it is necessary to present, in schematic form, the available vocabularies from which Boyle's literary expressions of piety and virtue were drawn. What is most important is to demonstrate Boyle's concern to constantly examine and purify the individual conscience, and to re-emphasise that this 'experimental' approach, with its intense focus on individual experience, was common to both Anglican and Puritan religious practice.²¹ Thomas Wood defines the practice of 'Holy Living', by English Protestants, as follows:

[A] detailed and systematic interpretation of all that is implied in [the] Pauline epitome of Christian living. They were concerned with every conceivable aspect of that life, whether public or private, whether personal or social, which should issue from personal faith and worship. They conceived their task as one of intensive and extensive moral education. It was their aim to educate the individual conscience in the way of holiness, and to educate the social conscience in the way of justice.²²

This passage encapsulates Boyle's programme for 'holy living', where all activities must result in real and solid benefits both to the individual and the community. Even the results of natural philosophy were to be grounded in experience which had as its analogue the view that the security of the individual conscience could only be achieved by means of an experiential alteration in the soul.²³

The eminent puritan divine, Richard Baxter, provides us with an apposite example of a puritan's perception of Boyle's conduct. It serves as an illustration of how Boyle's experimental philosophy was seen as profitable even by such a sharp critic of worldly pursuits. Baxter writes:

The recreations, which I have oft taken in your experimental philosophy, and other such writings, are not like those, which some men seek in cards and

of this work. 'Personal Development and Intellectual Biography: the Case of Robert Boyle', *BJHS*, 26 (1993), 335 - 45.

²¹ In order to demonstrate links between Anglican and Puritan spiritual practices, Lotte Mulligan provides a wonderfully cheeky comparison between the use of the concept of 'Right Reason' in the paradigmatic royalist *Eikon Basilike* (purported to have been written by Charles I) and in Gerard Winstanley's *The True Levellers Standard Advanced*. See, Lotte Mulligan, 'Robert Boyle, "Right Reason", and the Meaning of Metaphor', *J. Hist. Ideas*, 55 (1994), 235 - 57.

²² Thomas Wood *English Casuistical Divinity in the Seventeenth Century* (London, 1952), p. x, quoted in Harwood, *Early Essays and Ethics*, p. xlii.

²³ Mulligan, *op. cit.*, discusses Boyle's comments on an aspect of 'reason' which permits 'a higher and more excellent information, by supernatural discoveries or revelations'. See also Boyle, *Appendix to the First Part of the Christian Virtuoso*, 'Second Part', in *Works*, vi, where he constructed 'six heads or propositions' on experimental religion and personal experience. He described how the performance of the 'duties and functions of a Christian' ought not to be considered as 'receding from his old practice [that is, his addiction to 'experience']; and how in religion he was still 'but *trying an experiment*' (italics in original).

stage plays, and other murderers of precious time, whose fruit is nominally some true commodity, and really in hand; some unwholesome sensual delight, and finally the sting of sorrow, when irrevocable time is gone. But they have been a profitable pleasure which prepare not for repentance. But your plea for scripture style, and your Seraphic Loves [sic], and the noble designs of your Arabic publication of Grotious, and now your pious meditations and reflections, do call to me for greater reverence in the reading of them, and make me put off my hat, as if I were in the church.²⁴

Since Baxter was not prone to ingratiate himself with the aristocracy or to courting patronage to further his position, his approval of Boyle's activities can be taken at face value. One of the texts which he refers to in this letter is a series of 'reflections' or meditations in which Boyle discusses the constraint on our perceptions of the truth of things without the full intuitive vision which will be provided in the hereafter - our knowledge, at present, is seen but through a glass darkly. Given our mundane situation, Boyle suggests, we should 'make the world vocal' and then the 'little accidents' of the world and our lives will furnish us with 'Lectures of ethics and divinity'.²⁵ The idea that the world was written in divine hieroglyphics was a commonplace by this time.

For each page in the great volume of nature is full of real hieroglyphicks, where (by an invented way of expression) things stand for words, and their qualities for letters.²⁶

²⁴ Baxter to Boyle, June 14, 1665, *Works*, vi, pp. 516-520. On *Seraphic Love* See Principe. *op. cit.* Apart from the ethical works published in Harwood's book, *Seraphic Love* contains a vast amount of material which could throw further light on Boyle's spirituality and his early perceptions of the nature of natural philosophy. The full title is *Some motives and incentives to the love of God: written in the Pathetical Style*. It was first published in 1659, although composed some twelve years earlier. Whilst the work is written in the ornate rhetorical style of courtly manuals, replete with rich and vivid imagery - the 'otherworldly' style and content puts it in the category of devotional handbooks of the first half of the seventeenth century.

²⁵ Boyle. *Occasional Reflections upon Several Subjects* (1665). For an alternative reading of Boyle's use of the 'vividness' of natural signs see Simon Schaffer, 'Self Evidence', *Critical Inquiry*, 18 (1992), 327 - 62, esp. 328 ff. Also, Louis Trenchard More *The Life and Works of the Honourable Robert Boyle* (Oxford, 1944), p. 155. The reference to the 'glass darkly' is taken from 1 Cor. 13: 12, and was commonly cited as a scriptural proof-text when commenting on the nature of our present corrupted understandings - our present knowledge being only 'partial' - and on the complete attainment of our sanctified state when it would become a 'full' vision and a perfect understanding.

²⁶ *Works*, ii, p. 29. Boyle was fond of the alphabet analogy - 'Lucretius his Comparison', as he describes it. See Robert Markley, *op. cit.* pp. 110 - 11, where Boyle's use of the analogy is related to the conception of theology as a 'metalinguage'. Markley argues that Boyle's metaphors 'work continually to collapse distinctions between the books of nature and Scripture'. In contrast we see the ease with which Boyle has been identified with a 'plain style' by N. H. Keeble who speaks of the 'repudiation of figurative language' by philosophers such as Hobbes and Boyle. Their style became - he argues - the 'orthodoxy of the Royal Society'. See, *The Literary Culture of Nonconformity in*

However, Boyle insists that only those who are devoted to virtue and piety can take on the priestly role, enter the tabernacle of nature and read its divine language. This is the hallmark of the true Christian virtuoso and the results of this encounter should benefit both the Christian commonwealth and the private conscience.²⁷

Jeremy Taylor's schemes for a holy life serve to illustrate this practice in greater detail.²⁸ *Holy Living* emphatically upheld the view that religion is not true religion unless all our powers are employed in the service of God 'even all the dayes of our life' so that our 'nature' is turned into 'grace' and our 'natural actions' become 'actions of religion'.²⁹ According to P. G. Stanwood, Taylor divided Christian religious practice into three aspects, 'sobriety, justice and religion.' Taylor's explanation of these three practices is worth quoting in full as they provide an apposite characterisation of Boyle's holy life.

The first contains all our deportment in our personal and private capacities, the fair treating of our bodies, and our spirits. The second enlarges our duty in all relations to our Neighbour. The third contains the offices of direct Religion, and intercourse [sic] with God.³⁰

As Stanwood adds, 'Religion thus has its private, public and spiritual aspects'. Allied

Later Seventeenth-Century England (Leicester, 1987), p. 249. However, although I disagree with Keeble's analysis on this issue he offers an excellent survey of Nonconformist print culture.

²⁷ There is not the space in this thesis to pursue Boyle's role as 'priest' of nature. On this topic see Harold Fisch (full details in fn. 4, this chapter). See also *Works*, ii, p. 29 for Boyle's extended account of the 'celebration of divine service' by the priest in the temple of nature. What is fascinating about this account is how Boyle characterises the language of nature as, celebrating God's praises with a 'soundless voice', which can only be heard by our 'intellectual ears'. According to Boyle, the language of nature escaped the corruptions of 'the confusion of tongues', and that 'these natural and immortal preachers give all nations occasions to say of them, as the assembly at Pentecost did of the inspired Apostles, we do hear them speak in our tongues the wonderful works of God'.

²⁸ Jeremy Taylor, *op. cit.*, *passim*. Boyle must have been familiar with Taylor especially as the latter and John Evelyn were very close. Evelyn describes how he sought Taylor as a confessor, 'on the 31st [May, 1655]. I made a visit to [him], to confer with him about some spiritual matters, using him thenceforward as my ghostly father'. de Beer, iii, pp. 94 - 5. Moreover, Taylor produced one of the most renowned works on conscience in the seventeenth century - *Ductor Dubitantum or the Rule of Conscience* (1660).

²⁹ *Holy Living*, p. 18. Given this practice it might be more fruitful to provide less compartmentalised accounts of how Boyle's natural philosophy related to his theology. Baxter remarks. 'I read your theology as the life of your philosophy, and your philosophy as animated and dignified by your theology, yea indeed as its first part. For God himself beginneth the holy scriptures with the doctrine of physics: and he that will handle the covenant and laws of God, must describe first the covenanters God and man, the constitutive parts or the universal kingdom'. Baxter to Boyle, June 14, 1665, *Works*, vi, pp. 516 - 520. This accords well with Boyle's attempts to decipher God's inscriptions, both in Holy Writ and in the book of God's natural signs.

³⁰ Quoted. in Stanwood, *op. cit.*, p. xl.

to this general code was the more Puritan, and specifically practical, examination of conscience through the application of 'right reason'. For example, keeping detailed records of sins in spiritual diaries, confessions and commonplace books, and the widespread obsession with profitable company and occupations, as exemplified in Baxter's letter to Boyle.³¹ Margo Todd has shown how

Non-productive recreation was similarly condemned as unprofitable to individual or to commonwealth. Protestants, like their Catholic humanist forbears, quoted Cicero's opinion that 'We have not been so fashioned by nature that we seem to have been made for sport and games, but rather for hardship and for certain more serious and more important pursuits.'³²

These were sentiments that Boyle echoed throughout his life. His programme for the truly Christian life required constant examination of the 'groundedness' of all claims to truth in an experimental encounter, which was the only sure method of obtaining security. This applied equally to his spirituality and to his practice of natural philosophy. However, I am not claiming - by contrast with the argument of Shapin and Schaffer - that the 'experimental life' was a consequence of his experimental religion.³³ My emphasis is placed on Boyle's 'holy living' *per se*, whereas the authors of *Leviathan and the Air Pump* characterise Boyle through his efforts to construct the 'experimental life' as a social and conceptual expediency: Boyle's piety is thereby obscured and the term 'experiment' is unproblematically confined to the laboratory. Moreover, there is a devotional element in Boyle's writings which transmutes the mundane practice of publicly beneficial knowledge, produced by experiments, into an expression of Christian piety and worship.³⁴

According to my interpretation, the question of the relationship between Boyle's natural philosophy and his religion can be resolved by an examination of the irreducible nature of Boyle's holy life. It was Boyle's understanding that without a

³¹ John Harwood provides details of a selection of these works concerned with the removal of doubts, spiritual exercises, and the questioning tactics involved in 'reasoning' upon difficult topics, *op. cit.*, p. xxviii. On p. xl, Harwood reproduces a table called 'remoras of truth' from among the Boyle manuscripts. The third list deals specifically with 'Neglect' and is comprised of, 'method', 'illumination (attain'd by prayer)', 'Reading', 'Meditation', 'Observation [6] (vnder which, Tryals and Experiments)', and 'Conuersation (either by Discourse or Letters.) The Handmaid of all these is Repetition, or chewing the cud'. As Harwood points out all these 'were equally applicable to ethics and natural philosophy'.

³² Margo Todd, *Christian Humanism and the Puritan Social Order* (Cambridge, 1987), p. 150.

³³ *Leviathan and the Air Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, 1985).

³⁴ M. S. Fisher, *Robert Boyle, Devout Naturalist*, (Philadelphia, 1945).

secure experimental base in both religion and natural philosophy the imagination would run riot either in speculative system building, as in the case of the Aristotelians, or in the madness of enthusiasm which failed to subject its inner convictions to the rigour of right reason. Even the self-constructed catalogue of terms by which Boyle labelled his literary exercises points to the immediate and the experiential. James Paradis derives the following list from Boyle's descriptions of his various works: '*histories, meditations, tracts, dialogues, reflections, memoirs, considerations, notes, accounts, discourses, experiments, observations, paradoxes, letters, and essays*'.³⁵ In the light of the foregoing discussion, Boyle's gift of the Lectureship must be explained as the result of his lifelong piety and charity.

2. 2. Acts of Charity and Boyle's Fears for Weak Christians

By the time of his death Boyle's Christian charity was universally recognised within the international community of learning. The obituaries, reprinted in Maddison's biography of Boyle, all emphasised his renowned personal piety and virtue. For example, Gilbert Burnet's funeral sermon, delivered in the grand style of epideictic rhetoric, is an extended celebration of Boyle's truly Christian behaviour.³⁶ The location of Boyle's piety within the context of 'holy living', outlined in the previous section, adds historical veracity to the descriptions contained in these texts. These accounts were not simply hagiographic, the conventions of obituary and funeral orations notwithstanding. I will attempt, in this section, to place Boyle's bequests, including his last will and testament, within the context of his pious *behaviour*. I emphasise the term 'behaviour' as this will take analytic priority over 'intentions'.³⁷

The problem of distinguishing between intentions and behaviour is exacerbated in the study of theological discourse where the experiential source of the

³⁵ James Paradis, 'Montaigne, Boyle, and the Essays of Experience', in, George Levine, ed., *One Culture* (Madison, 1987), pp. 59 - 91, p. 73.

³⁶ Gilbert Burnet, *A Sermon Preached at the Funeral of the Honourable Robert Boyle* (London, 1692). For an alternative interpretation of Burnet's rhetoric see Michael Hunter's remarks in *Boyle and his Friends*, pp. xxix ff.

³⁷ On the other hand, if Boyle's intentions were covertly political or economic they are so well disguised that it requires highly selective readings to construct such an interpretation. The *locus classicus* for a detailed reading of Boyle's political and economic motivations is still, James R. Jacob, *Robert Boyle and the English Revolution: A Study in Social and Intellectual Change* (New York, 1977).

written text is highly significant. Intentions, being the subjective origins of written or spoken claims, have come under fire lately from both sociological and postmodernist exegesis. However, in Boyle's case there are consistent parallels between his self-proclamations and his religious behaviour. Boyle behaved *as if* his practical spirituality stemmed from a clear and well-founded perception of the truth of Christianity. Consequently, I treat this behaviour at face value.³⁸ The history of Boyle's concern with his spiritual state can be traced back to his teenage years, long before his public involvement in pious schemes for the advancement of knowledge. In the absence of evidence to the contrary it is more problematic to explain this biographical fact - the continuous representation of himself as pious 'Christian Virtuoso' - as the product of political expediency.

In his sensitive discussion of 'cases of conscience', Hunter has provided us with an analysis of a pertinent aspect of Boyle's spiritual concerns in the period just prior to his death.³⁹ Hunter's study centres on private letters between 'anxious laymen' and divines - focusing mainly on Boyle's anxieties in 1691, the year of his death.⁴⁰ In these documents we have, as Hunter says, 'a significant dimension of the religious outlook of one of the leading lay apologists of the truth of Christianity in seventeenth-century England'.⁴¹ Interestingly, Hunter draws attention to the significant divergence in the explanations offered by Boyle and by his confessors over the origins of his acute spiritual anxieties. The casuists treated Boyle's concerns in naturalistic terms and suggested that his more acute anxieties were the result of disturbances in the animal spirits. However, Boyle considered they were not 'over-scrupulous' but were intense moral and spiritual urgencies which demanded

³⁸ I do not claim this is unproblematic but the origins and aetiology of religious expression are not part of my investigation. In the field of History of Religions (Religionswissenschaft) there is a sizeable literature dealing with this topic. It would be an interesting exercise to apply the tools and methods of this field to the religious 'experience' of historical agents covered in the History of Science. A useful starting-point is Ninian Smart, 'Understanding Religious Experience', in Steven T. Katz, ed., *Mysticism and Philosophical Analysis* (London, 1978), pp. 10 - 24.

³⁹ See, Michael Hunter, 'Casuistry in Action', full citation, fn. 13 above.

⁴⁰ Hunter focuses on Boyle's discussions with Burnet and Stillingfleet, who would have been preoccupied with the problems of oath-taking and conscience in view of the problems generated by the Revolution-settlement. See J. P. Kenyon, *Revolution Principles: The Politics of Party 1689-1720* (Cambridge, 1977). For a recent discussion of Burnet's role in the Revolution see, Tony Claydon, *William III and the Godley Revolution* (Cambridge, 1996).

⁴¹ *Op. cit.*, p. 81-2.

institutional corroboration for their resolution.⁴²

In order to adumbrate Boyle's perennial examinations (Hunter calls them 'obsessions') of the state of his soul, Hunter takes us from scenes of intense doubting in the early biographical 'Philaretus' through to the foundation and funding of his various charitable and missionary schemes.⁴³ Some of these schemes were to finance the composition of texts dealing with cases of conscience. Thomas Barlow, in his letter to Boyle in 1683, provided a succinct description of the main purposes of a work of casuistry.⁴⁴ Barlow thanks Boyle for drawing his attention to a topic 'of exceeding great use, to direct the conscience and the conversation of any, especially of weaker Christians'. The role assigned to casuistry bears a strong resemblance to the third of Boyle's 'offices', entrusted to the chosen divine, in the codicil appended to found the Lectureship - there were three separate offices in the codicil. Boyle requested that the appointed preaching minister be ready 'to satisfy such real Scruples as any may have . . . and to answer such new Objections or Difficulties as may be started to wch good Answers have not yet been made'.⁴⁵

The duty, outlined by Boyle, demonstrates his perception of the need for

⁴² In *The Mental World of Stuart Women: Three Studies* (Brighton, 1987), Sara Heller Mendelson documents the behaviour of Boyle's sister who exhibited the extreme physical manifestations of spiritual practice usually associated with Puritan 'experimental' religion. The examples described in Heller's work ought to warn the historian against exaggerating the intensity of Boyle's anxieties, and so normalise them as ordinary daily reflections and examinations of conscience. The production of confessional biographies in the seventeenth century was enormous. For an account of this genre see Owen Watkins, *The Puritan Experience, passim*.

⁴³ *An Account of Philaretus During His Minority*, in Maddison, *Life*, pp. 2 - 56.; Malcolm Oster, 'Biography, Culture and Science: the Formative Years of Robert Boyle', *Hist. Sci.*, 31 (1993), 177 - 226. Oster's thesis (see, this chapter. fn. 4) contains an extended discussion of Boyle's early environment and the spiritual influences on him. I discuss Boyle's early crises below, how they originated in his perception of threats to weaker Christians and their role in the endowment of the Lectureship.

⁴⁴ Barlow's comments can be seen in full in Hunter, 'Casuistry in Action', p. 85. Boyle also provided a stipend of £50 per annum for Robert Sanderson to write cases of conscience. Interestingly the brief to Sanderson is highly specific, see, Boyle, *Works*, i, p. lix. The difficulty of establishing membership of a coherent programme of Anglican science is illustrated by the fact that Barlow, in his *Genuine Remains*, attacked the atomic philosophy. For further details see, Michael R. G Spiller, "Concerning Natural Experimental Philosophie": Meric Casaubon and the Royal Society (The Hague, 1980).

⁴⁵ On cases of conscience see, Thomas Wood, *English Casuistical Divinity During the Seventeenth Century with Special Reference to Jeremy Taylor* (London, 1952); H. R. McAdoo, *The Structure of Caroline Moral Theology* (London, 1949); Edmund Leites, ed., *Conscience and Casuistry in Early Modern Europe* (Cambridge, 1988); Camille Slights, 'Ingenious Piety: Anglican Casuistry of the Seventeenth Century', *Harvard Theological Review*, 63 (1970), 409 - 32. Early in his literary career, Boyle produced an essay entitled 'Of Censuring and Casuists'. See, Harwood, *op. cit.*, p. xix.

answering cases of conscience which included doubts raised in the minds of Christians through contact with irreligion or with other faiths. In fact Boyle had already adumbrated a scheme for 'gospelling' those of other faiths.⁴⁶ The growing problem of increasingly pressing 'real Scruples' was exacerbated by the campaigns of the various 'enemies' of Christianity listed in the will. The duty of responding to this need was listed separately from the obligation to present a defence of Christianity from the pulpit. I suggest that the Sermons were to be the public equivalent of the examination of scruples and the resolving of doubts according to an application of right reason. It must be pointed out that the Boyle Lecturers may not have honoured Boyle's intentions and therefore we must not assume a continuous lineage between Boyle's views - either in form or content - and the views of the Lecturers.

His perception of the threat to weak Christians was further enhanced by the constant internecine struggles among the various factions contending for ecclesiastical dominance. Birch claims that Boyle was moved to employ Barlow due to the fear of 'vindictive retaliations' by the restored bishops against those who refused to conform at the Restoration.⁴⁷ The bequests, according to this interpretation of Boyle's stated concerns, are the practical response to the threatened seduction of Christians weakened by witnessing interminable squabbles, and his perception that the arguments of the heterodox were subject to constant renewal from whatever sources available. Boyle's ever-present fear, based on his own experiences with the perennial presence of doubt, was that these irreligious activities could 'stagger' the religion of those who had not 'grounded' it on experience. It was not only the Jesuits who 'ever love to fish in troubled waters'.⁴⁸

2. 3. The Last Will and Testament of a Christian Virtuoso

The codicil appended to Boyle's will, in which he specified the 'offices' to be carried out, is treated by many commentators as an endowment dealing specifically

⁴⁶ See, *Works*, i, p. cix, where Boyle outlined his 'method' - translate, confute, learn the requisite languages, preach and catechise, breed the young to confute their own priests and also to convert their countrymen.

⁴⁷ Birch informs us that Boyle was convinced intolerance sprang from uncertainty regarding one's own convictions and that he employed Barlow to write on Toleration because he believed the Restoration would bring a 'vindictive retaliation'. See, *Works*, i, p. cxli.

⁴⁸ Spurr, *op. cit.*, p. 11.

with the apologetic defence of Anglicanism and the utilisation of science in such a defence.⁴⁹ However, the codicil is manifestly non-denominational since it simply refers to 'Christianity'. I emphasise this distinction, as the characterisation of the bequest as part of an 'Anglican' programme precludes a properly focused reading of Boyle's instructions and obscures his long-term involvement with other pious schemes. Considering Boyle's many references to the undesirability of factions within Christianity it would be gratuitous to attribute to him the intention of promoting Anglican hegemony. Boyle never expressed dissatisfaction with the institution of the Church, yet his personal and scholarly contacts spread right across the Christian spectrum. Whatever spleen Boyle vented - it was rare in print or in private correspondence - was always aimed at the internecine controversies of the various contending ecclesiastical parties. Also, Boyle's notoriously scrupulous literary style and his pernicky dealings with printers ought to alert us to a too casual reading of such an important document as his last will and testament. Therefore my discussion of the will is predicated on the necessity for a close reading of the document itself. This also highlights the interplay of personal and institutional areas of activity, and serves to adumbrate the distinction between the *origin* of the Lectureship and its *implementation*. The bequest was a charitable act expressing Boyle's piety: it needs to be treated independently from the subsequent management of the bequest.

According to Maddison, 'About the middle of the year 1691 Robert Boyle became aware of his continued failing health, and he resolved to draw up his last will and testament, which he signed, 18 July 1691'.⁵⁰ The text of the will comprises sixteen large sheets of paper each approximately, 16 x 13 inches with the codicil relating to the Lectureship occupying the eleventh sheet. There were seven codicils added to the will making it a sizeable resource for investigating Boyle's concerns during the last year of his life. Although this important resource has been reproduced

⁴⁹ The most succinct expression of this claim can be found in J. R. and M. C. Jacob's, 'The Anglican Origins of Modern Science: The Metaphysical Foundations of the Whig Constitution', *Isis*, 71 (1980), 251 - 67. See also Henry Guerlac and M. C. Jacob, 'Bentley, Newton, and Providence (The Boyle Lectures Once More)', *J. Hist. Ideas*, 30 (1969), 307 - 18. Recent more general works on the Seventeenth Century unproblematically assume this stance. For an example of this assumption, see Raymond D. Tumbleson, ' "Reason and Religion": Science of Anglicanism', *J. Hist. Ideas*, 57 (1996), 131 - 56.

⁵⁰ Maddison, *Life*, p. 179.

and discussed in the Boyle literature certain elements have consistently been ignored or overlooked. These elements are particularly pertinent for an understanding of Boyle's declared intentions relating to the foundation of his Lectureship.

Neither the Lectureship, nor the other offices, are mentioned in the main text of the will. That particular codicil is not prioritised in any way and the other six codicils also deal with charitable bequests. The foundation of the Lectureship is only one of three separate 'offices' which Boyle outlines in his instructions. The other two are:

1. To be Assisting to all Companies and encourageing [sic] of them in any undertakings for the Propagating the Christian Religion to Foreigne Parts.
2. To be ready to satisfy such real Scruples as any may have concerning those Matters and to Answer such new Objections or Difficulties as may be started to wch good Answers have not yet been made.⁵¹

My reading of these precise instructions, allied to a narrative which locates the bequest in the general context of Boyle's pious behaviour, will cast doubt on the received view that Boyle laid the foundations for a public presentation of a social order 'underpinned' by natural theology or natural religion. This is an important point, as it is a key factor in the Jacob thesis that Boyle's intention to provide an endowment was known by the Trustees well in advance of his death.⁵² Such an interpretation suggests that Boyle and the Trustees formed a coherent cabal, acting with definite programmatic foresight, which included the utilisation of the pulpit as a vehicle for the propagation of social and political aims. It should come as no surprise that the pulpit was an effective resource especially in situations where ecclesiastical and state fortunes were intimately entwined. However, the issue is whether or not Boyle sought to use the pulpit in this manner.

Boyle had extensive contact with London divines particularly with regard to the issue of moderation. In a letter to William Wotton, Thomas Dent reported that Boyle had expressed to him his preference for the Church of England, but

⁵¹ *Ibid.*, p. 274.

⁵² *NER*, p. 147 ff. This is one of the areas in which Jacob has made numerous rather hasty conclusions. I resume discussion of this point in the next chapter which deals with the Trustees. It must be emphasised here that the concentration on Boyle's reaction to the 'sectaries', which forms the basis for Jacob's interpretation of Boyle's programme, has precluded a discussion of the more obvious targets for Boyle's fears - the other religions and the irreligious.

he was for moderation to those who dissented from us, and not to force their tender consciences, for which he seemed to express great aversion. He had frequent conferences on the subject with the present archbishop [Tenison], bishop of Sarum [Burnet], but particularly the late bishop of Worcester, the learned Dr. Stillingfleet, for whose depth of learning and solid judgement he had always the greatest value and esteem.⁵³

The one churchman, included in this list, with whom Boyle did discuss ‘a Lecture for the Christian Religion’ was Gilbert Burnet. Boyle had partly financed the publication of Burnet’s *History of the Reformation* and Burnet was the only individual divine to receive a personal bequest in his will - he was left a large clasped Hebrew Bible.⁵⁴ Discussion of the lectureship took place in a series of interviews given by Boyle to Burnet as memoranda toward a projected life of Boyle. Michael Hunter has provided an account of this document, which he calls the ‘Burnet Memorandum’, outlining the references to an idea for a series of sermons. Hunter suggests that Burnet may have given Boyle the idea or at least helped him to formulate the project. He points out the ‘striking’ similarity between the wording of this early scheme for a lectureship with the more widely known final form contained in Boyle’s will.⁵⁵ There are variations in the administrative requisites, between the two documents. For example, the ‘memorandum’ is even more precise in its bureaucratic recommendations as to how the nominations should be made. It stipulated that the ‘Donor’ (Boyle) and the ‘Trustees to the number of 5 with a power of substitution who with the Bishop of London and the Deane of St. Pauls’, were to choose an ‘Eminent Clergyman of London’ according to ‘whom they in their conscience think the fittest for it’. They were also enjoined (or would have been if this draft had been effected) to ‘receive no solicitations from any hand but chose all *Motu proprio*’.

Apart from the insight provided into the intended strict management of the Lectureship this document sheds further light on the relationship between Burnet and Boyle, which has never been worked out in detail. One very important issue is the

⁵³ Birch. *Works*, i, p. cxli. If Boyle did have such a high opinion of Stillingfleet then it is not surprising that it was the Bishop of Worcester’s chaplain, Richard Bentley, who was chosen to give the first sermons. The role of Stillingfleet in the selection of Bentley is discussed in Chapter Four of this thesis.

⁵⁴ Maddison, *Life*, p. 140. T. E. S. Clarke and H. C. Foxcroft, *A Life of Gilbert Burnet Bishop of Salisbury* (Cambridge, 1907), p. 151.

⁵⁵ *Robert Boyle by Himself and His Friends: with a Fragment of William Wotton’s Lost Life of Boyle*. Edited with an Introduction by Michael Hunter (London, 1994). The discussion of the ‘Burnet Memorandum’ can be found on pp. xxiv ff.

similarity in their respective perceptions of dissent. Burnet came from a strongly dissenting family on his mother's side: the members of this branch of Burnet's kin, being Presbyterian, were horrified at his allegiance to the established Church and episcopacy.⁵⁶ In the *Supplement* to Burnet's *History*, there is an account of his opinion of dissenting ministers, in which he gives the following description of the peculiarly Puritan nature of cases of conscience:

their way of preaching was plain and intelligible, but very dull; it went generally on doctrine, reason and use, only those of a more exalted form ran out much into subtilties, about scruples, which they called cases of conscience . . . They had also frequent private meetings where those that were of a higher dispensation than the rest met, sometimes without the minister and sometimes with him, and used to propose their cases and discourse about them, and pray concerning them.⁵⁷

Burnet praised the piety and ecclesiastical discipline of the dissenting churches whilst at the same time criticising their narrowness of spirit. However, his overall tenor was one of sympathy. The crucial distinction to bear in mind in dealing with the attitudes of both Boyle and Burnet, regarding toleration and tenderness of conscience, is between the perception of piety, in practices outside the established formulas, and doctrinal laxity. Neither Boyle nor Burnet - the arch Latitudinarian - replaced doctrinal exactitude by prioritising reason. The perception of dissenting piety by Boyle, Burnet (and Tenison among others) in tandem with the recognition of a beleaguered Christianity, resulted in their demands for a charitable attitude toward those who obviously conformed, not to an orthodox doctrinal formulation, but to a primitive and universal Christianity.⁵⁸

In Boyle's case natural philosophy was not allied to a specific Anglican

⁵⁶ Gilbert Burnet. 'Rough Draught of My Own Life'(Bodl. Add. MSS. D. 24, ff. 195-218) appended to *Supplement*, pp. 451-514.

⁵⁷ *Supplement*, p. 31. Burnet was a very competent preacher and wrote pastoral works of instruction for divines on preaching and parochial duties. He was instrumental in the anti-Catholicising policies of James II and in the invitation to William and Mary to invade England. Whilst he was for toleration for dissenters he remained doctrinally faithful to the Anglican Church.

⁵⁸ The notion of a humanist primitive-Christianity was best expressed by Erasmus in what has been called a 'theological rhetoric', in Manfred Hoffmann, *Rhetoric and Theology: The Hermeneutic of Erasmus* (Toronto/London, 1994). It was anti-Scholastic, sceptical, prudential rather than systematic and dogmatic, and non-denominational. Erasmus considered that the *restitutio christianismus* should be informed by *philosophia christiani*. The *Christiani militi* were devoted to the restoration of texts to their primitive purity which paralleled the restoration of the Christian soul to primitive piety and virtue. Also, the loci for Erasmus must, as with Boyle, be drawn from the divine wisdom of Scripture and from nature. Furthermore, it was this kind of scholarly, prudential erudition which Evelyn encountered in the Parisian crudites, Pieresc, Naudé and Gassendi.

ecclesiology. Instead it was an expression of the experiential encounter with this universal Christian piety shared by members of all factions. His relationships with Hartlib, Oldenburg, Evelyn and Beale and his sympathy for their respective schemes for the advancement of learning and universal 'colleges' can also be understood as an expression of a universal Christianity. Beale in a letter to Hartlib described the Boyle family as being among those who

have answered all Lord Bacon's votes for [the] *Advancement of Learning*; and this honourable family deserves to be reputed the first college in this university or oecumenical academy.⁵⁹

Although Boyle, as Birch tells us, 'was constant to the established Church, and went to no separate assemblies', it is still possible to interpret Boyle's religious attitudes outside strictly Anglican parameters. He refused holy orders and the Presidency of the Royal Society on the grounds of his acute sensitivity to the taking of oaths. In the latter case he consulted three lawyers, one of whom was a judge of the King's Bench, in order to arrive at a degree of certainty as to his decision.⁶⁰ This freedom from institutional constraint was a necessary adjunct for one who relied so rigidly on the dictates of conscience. It is also representative of the perennial Puritan demand that the criterion of certainty must be located within the individual conscience and its experimental encounter with the purity of the Word.⁶¹ Boyle must have been aware that the literature of cases of conscience was, as Burnet noted, a Puritan exercise. However, he never adopted the position of more radical Puritans who saw the necessity for an independent conscience unfettered by authority. He was critical of this extreme emphasis on individual inner-light - especially as its exponents were sometimes given to anti-authoritarian enthusiasm - based solely on a purported infusional grace. He was also highly critical of the

⁵⁹ *Works*, i, p. lxiii.

⁶⁰ Maddison, when referring to Boyle's tenderness of conscience about taking oaths, associates it with his tolerant attitude towards dissenters. He considers the possibility that Boyle's refusal to accept the presidency of the Royal Society was linked to the fear of being exposed as a dissenter should he refuse to take 'the test act'. The reference to 'separated Assemblies' was made by Burnet, 'He was constant to the Church; and went to no separated Assemblies, how charitably soever he might think of these Persons, and how plentifully soever he might have reli[e]ved their Necessities'. *A Sermon Preached at the Funeral of the Honourable Robert Boyle* (London, 1692).

⁶¹ For a detailed discussion of experimental certainty in a Puritan context see, Nigel Smith *Perfection Proclaimed: Language and Literature in English Radical Thought 1640-1660* (Oxford, 1989), esp. Chapter One, 'Prophecy, Experience, and the presentation of the Self', pp. 23 - 72.

burgeoning proliferation of London religious groups, and he ridiculed itinerant 'prophets' as 'sects of one'. Although he supported the sanctity of the individual conscience as the ultimate criterion of spiritual certainty, the individual ought not to act in isolation from spiritual confessors. Boyle never wandered from institutional propriety and far from relying solely on his own inner-light, he constantly sought professional and confessional assistance from ecclesiastical and legal authorities in any decision relating to acts which demanded a high degree of certainty.⁶² This is reflected in his search for certainty regarding the numerous acts of public and private Christian charity which he was party to. For example, the tortuous precision of the bequests in his last will and testament; his agonising over the legality of improprated acquisitions in Ireland and in his recourse to extensive legal advice over the Presidency of the Royal Society. The tortuous prose of his printed works, with endless digressions and qualifications, is reflected in his complex discussions with confessors and the wording of the bequest in the codicil which outlines the nature of the Lectureship.⁶³

The nature of a last will and testament demands the elimination of any possibility of ambiguity.⁶⁴ Considering Boyle's prolix, convoluted literary style and his concern with the precise transmission of textual information, he would have been as unambiguous as possible in making clear his intentions over events that would soon be beyond his immediate control. For this reason we must consider the exact wording of the relevant codicil.

⁶² The concept of 'certainty' and its cultural significance has long been a focus for scholars of the seventeenth century. See Barbara J. Shapiro, *Probability and Certainty in Seventeenth-Century England* (New Jersey, 1983); Henry van Leeuwen, *The Problem of Certainty in English Thought 1630-1690* (The Hague, 1963); Douglas Lane Patey, *Probability and Literary Form* (Cambridge, 1984); Rose-Mary Sargant, 'Scientific Experiment and Legal Expertise: the Way of Experience in Seventeenth-Century England', *Studies in History and Philosophy of science* 20 (1989) 19-45. Benjamin Nelson, ' "Probabilists", "Antiprobabilists" and the Quest for Certitude in the Sixteenth and Seventeenth Centuries', *Actes du XC Congres Internationale d'Histoire des Sciences, Proceedings*, 1 (1965). I will deal further with the notion of 'certainty' in Chapter Six, in connection with the method of Samuel Clarke's Boyle Sermons.

⁶³ Sir Thomas Molyneux, in a letter to his brother, gives the following brief description of Boyle's style. 'I was but a short time in Mr. Boyle's company, and therefore am not fit to give any sort of character of him. He stutters, though not much; speaks very slow, and with many circumlocutions, just as he writes'. Quoted in, 'Gallery of Illustrious Irishmen', No. XIII', *Dublin University Magazine*, xvii, p. 320.

⁶⁴ On probate and wills in this period. John Addy, *Death, Money and the Vultures: Inheritance and Avarice, 1660-1750* (London/New York, 1992).

Whereas I have an Intention to Settle in my Life time the Sume of Fifty pounds per Annum for ever or att Least for a considerable Number of yeares to be for an Annual Salary for some Learned divine or Preaching Minister from time to time to be Elcted and Resident within the City of London or Circuite of the Bills of Mortality, who shall be enjoyned to performe the Offices following.⁶⁵

Boyle makes it quite clear that he was to have an effective role in the establishment of this endowment while he lived. What role did he envisage? The first office, the one most familiar to historians, outlines Boyle's brief both to the Trustees and to prospective preachers:

To Preach Eight Sermons in the yeare for proveing the Christian Religion agt notorious Infidels (vizt) Atheists, Theists, Pagans, Jews, and Mahometans, not descending lower to any Controversies that are among Christians themselves, These Lectures to be on the First Monday of the respective Months of January, February, March, Aprill, September, October, November in such Church as my Trustees herein named shall from time to time appoint.⁶⁶

The Trustees, in consultation with Boyle, were to appoint the church where the Lectures were to be delivered. That was to be the Trustees' only function whilst Boyle lived. The funds for establishing the Lectureship were to be derived from the profits accruing from estates which had not yet been purchased.

And whereas I have not yet mett wth a convenient Purchase of Lands of Inheritance for accomplishing such my Intention I doe therefore Will and Ordaine (in case it shall pleas God to take me hence before such Settlement be made) That all that my Messuage or Dwelling House in St. Michael Crooked Lane London, wch I hold by Lease for a certaine Number of yeares yet to Come shall stand and be Charged during the Remainder of such Terme as shall be to Come and Expire at the time of my decease wth the paymt of the cleere yearely Rent & Proffitts that shall from time to time be made thereof (Ground Rent, Taxcs. and necessary Reparacons [sic] being first to bec deducted).⁶⁷

Once again Boyle made it clear that the Lectureship was a project to be carried out while he lived. This is evident from the method of payment of those chosen to deliver the sermons since the quarterly payments (Midsummer, Michaelmas, Christmas and Ladyday) were to be made to 'such Learned Divine or Preaching

⁶⁵ Maddison, *Life*, p.274.

⁶⁶ *Ibid.* p., 274. Boyle, in a letter to Robert Thompson of the East India Company, requested 'the publishing of a solid but civilly penned confutation of the authentic books wherein the Bramins [sic] religion is contained'. See, *Works*, i, pp. cviii - cix. Obviously the 'Bramins' were not an immediate threat in late seventeenth-century London.

⁶⁷ Madison, *op. cit.*, pp. 274 - 75.

Minister as shall bee in that Employnt at the time of my death'. If Boyle died before the first payment, the preacher was to receive this on the first Feast 'as shall first happen next after my decease'.

However, after Boyle's death the Trustees would have sole responsibility for appointing lecturers.

And I will That after my death Sr John Rotherham Sarjent at Law Sr Henry Ashurst of London Knt and Baronett Thomas Tennisson dr in divinity and John Evelyn senior Esqr and the Survivors or survivor of them and any such person or persons as the Survivor of them shall Appoint to Succeede in the following Trust, shall have the Election and Nomination of such Lecturer And also shall and may Constitute and Appoint him for any Terme not exceeding Three yeares, And att the end of such Terme shall make a new Election and Appointment of the same or any other Learned Minister of the Gospell resideing wthin the City of London or Extent of the Bills of Mortality att their discretions.⁶⁸

The Trustees were to appoint the church, and only after Boyle's death were they to 'have the Election and Nomination' of candidates. This crucial phrase signifies a transference after Boyle's death of the right to elect the preacher from Boyle himself to the Trustees. Had Boyle lived the Sermons would truly have been Boyle's Lectures since he would have played a role in the decision over which cleric was to deliver the Lectures. His precise instructions, laid down in the text of the first office, did however provide Boyle with a degree of posthumous control, by vicariously constraining the range and scope of the Lectures. The specificity of Boyle's brief, determining and constraining the limits of the first office, was strictly adhered to by the Trustees and by the Lecturers.⁶⁹ Furthermore, the possible connotations - vastly more extensive than strict definition ought to have permitted - placed on the meanings of Boyle's categories of 'infidels' extended the scope of the Lectureship. The rather fluid and contingent usage of these polemical terms allowed the personnel of the lectureship to draw within the rubric of the brief any antagonist regardless of real danger. Public confutation of the enemies of Christianity was one possible route to preferment, publication, and an opportunity to continue local literary squabbles.

⁶⁸ *Ibid.*, p. 275.

⁶⁹ The administrative aspects were not so strictly followed. In 1697 the Attorney General filed a Bill of Complaint against the executors of Boyle's will, and insisted that the Lord Chancellor force them to fulfil Boyle's wishes over the Lectureship. On the administrative problems which developed over the management of the various bequests - including the Lectureship - see Maddison, *op. cit.*, pp. 206 ff.

2. 4. 'Notorious Infidels'.

The list of 'enemies', or to use Boyle's own term 'notorious Infidels', in the codicil constitutes a spectrum of non-Christian views and practices which contemporaries of Boyle would have had little difficulty in perceiving as a catalogue of the main heads of unbelief. The public refutation, and 'confutation', of this group was the sole purpose of the first office.⁷⁰ Yet the problem of establishing the precise nature of the elements of this group is all too familiar in the literature on anti-Christian attitudes and behaviour. For this reason I acknowledge the standard historiographical caveats when dealing with characterisations of opponents by historical agents - therefore I will treat these terms as problematic. It is now generally accepted by historians of heterodoxy that they were often used simply to cast a slight on an opponent, a form of literary abuse. For example, it would not be uncommon to see someone referred to as both a 'Mahometan' and an 'atheist' or at one and the same time a 'Socinian' a 'Deist' and a 'Pagan'.⁷¹

Michael Hunter and David Wotton, in their introduction to a recent collection of essays, highlight the problem of dealing with terms such as 'atheism' or 'deism'.⁷² Even these familiar terms prove to be intractable as, apart from their *ad hominem* usage, they could refer to a range of positions having shared characteristics (for example, those who played down the role for Revelation by emphasising the reliance on 'reason' in the process of salvation and worship, were referred to as either 'atheist', 'deist', 'Socinian', 'Averroist', etc.). At the same time it should not be assumed that divines were incapable of determining with any precision the position

⁷⁰ The *OED* defines the term 'confutation' as 'The action of confuting; disproving, disproof, overthrow in argument.' It is also a substantive: 'The complete argument, statement, or treatise, in which anything is confuted.' It carries the senses of silencing and answering conclusively, or reducing to a state of dumbfoundedness any opponent. It was used as early as 1526, and the title of John Dove's *A Confutation of Atheism* (1605) is identical to the title of Bentley's Boyle Sermons almost ninety years later.

⁷¹ Examples of the fluid usage of these terms may be found in Peter Harrison, *'Religion' and the Religions in the English Enlightenment* (Cambridge, 1990).

⁷² Michael Hunter and David Wootton, eds., *Atheism From the Reformation to the Enlightenment* (Oxford, 1992); David Berman, *History of Atheism In Britain From Hobbes to Russell* (London, 1988). For an interesting account of the rise of atheism, which attributes its success to the abandoning of the defence of Christianity by the theologians and delegating it to the philosophers, see Michael J. Buckley, *At the Origins of Modern Atheism* (New Haven and London, 1987). Buckley also makes it clear that the languages and practices of atheism and Christianity are symbiotic and are inevitably the products of each other's programmatic aims.

held by each opponent. Hobbes appositely and succinctly described this strategy when he asserted that the aim of rhetoric was victory.⁷³ The aim of the Boyle Lecturers was not to present their audiences with precise definitions of what constituted the deistic or atheistic positions but to display the inherent weaknesses and failures of all argumentation which did not have the hallmark of righteousness as determined and defined by contemporary ecclesiastical and doctrinal authority.

Whilst the exact nature of the actual beliefs, or religious outlook, of the enemies of Christianity in the seventeenth century has engendered enormous debate, the precise contours of these beliefs is not an essential factor in this study. The main focus is on the manner in which opponents were answered by the orthodox, in order to show how argumentative strategies were often the result of contingent requirements. A further complication arises from the fact that articulation of heterodox opinions was often constrained by an awareness of a possible harsh punitive response from the orthodox. Hunter and Wotton provide a succinct account of these issues:

One of the difficulties in approaching this topic is an elusiveness that owes something to the inhibitions imposed on free-thinkers by the attitudes of the orthodox authorities of the day, but something also to the conceptual problems involved in defining exactly what it is that is being studied⁷⁴

However, I suggest that the problem of dealing with actual beliefs is a separate issue from that of the textual and career strategies deployed by participants in polemical encounters. How they structured their arguments quite often depended on contingent factors which determined the choice of vocabularies and categories of debate. Yet I do not wish to suggest that 'atheists' existed only in polemical texts or in the argumentative strategies of place-seeking divines who would receive preferment as a reward for vanquishing purely suppositional enemies.

⁷³ Hobbes, *A Briefe of the Art of Rhetorique* (London, 1637). Hobbes published the work anonymously, but Aubrey was convinced that Hobbes was the author. 'though his name be not to it'. See Quentin Skinner, *Reason and Rhetoric in the Philosophy of Hobbes* (Cambridge, 1996) pp. 38 ff. - the quotation from Aubrey is on p. 38, fn. 182. For an illuminating discussion of Hobbes' text and the way in which Hobbes distinguished between 'truth' and 'victory' see, Victoria Kahn, *Rhetoric, Prudence, and Scepticism in the Renaissance* (Ithaca/London, 1985), esp. Chapter Six, 'Hobbes: A Rhetoric of Logic'. It was a standard tactic - often used in orthodox polemics - that all arguments were more effective in the hands of the righteous: they argued, contrary to Hobbes, that truth and victory were of necessity the properties of a righteous defence. This will be an important issue when dealing with the tactics deployed in particular sermons.

⁷⁴ Hunter and Wootton, *op. cit.*, p. 2.

The form and content of orthodox polemics were determined by particular instantiations. The perennial confrontation with diverse enemies had long since been worked out in terms of institutional commonplaces. The historical self-perception of Christianity was very often portrayed in a narrative which presented the forces of righteousness besieged by various powers of darkness. Thus, deployment of effective argumentative strategies by the orthodox had, prior to the defensive texts of late seventeenth-century Anglicanism, generated taxonomies of unbelief which may, or may not, have had a source in actual belief.⁷⁵ This allowed extensive rhetorical latitude. Allied to this argumentative strategy was the struggle to appropriate contested materials. By drawing their armaments from shared vocabularies and rhetorical tactics, opponents generated complex attitudes and tensions towards inherited texts. This is especially true in the historical relationship between Christianity and its deployment of pagan learning and secular knowledge. Within institutions of learning there was also the practice of scholarly competition over problems of interpretation, dating, validity of texts, propriety of use, and simple personal animosity.⁷⁶ Cicero, Quintillian, and Demosthenes were common property, as were contemporary works of natural philosophy and other secular disciplines. The conflicting uses of natural philosophy in the arguments of Toland and Bentley, the conflicting use of recently discovered exegetical techniques by Deists such as Shaftesbury and Blount and by orthodox Oxford philologists and critics, and the pretence of an alliance with High Church polemicists on the part of critics whose covert aim was a critique of the use of reason in the defence of Christian mystery, are all examples of the rhetorical use of appropriation.⁷⁷ Thus although Boyle's list delineated certain boundaries, the manner of orthodox confutations of the irreligious

⁷⁵ Cudworth's *True Intellectual System* provided such a taxonomy. Another illustration can be found in the well known four types of atheists in the first of Samuel Clarke's Boyle Sermons. Philip Skelton's *Ophiomaches, or Deism Revealed* (1749) provides a survey of the full range of argumentative strategies used by the irreligious and the countermeasures of the orthodox in the eight dialogues of his text. See David Berman's edition (2 vols., Bristol, 1990).

⁷⁶ The 'ancients-moderns' debates were as much to do with scholarly credibility and personalities as they were with political alignments. Joseph M. Levine, 'Ancients and Moderns Reconsidered', *Eighteenth Century Studies* 15 (1981-2); *idem.*, *The Battle of the Books: History and Literature in the Augustan Age* (Ithaca, London, 1991). Levine's work is discussed at greater length in Chapter Five below.

⁷⁷ David Berman, 'On the Art of Theological Lying', in J. A. Leo Lemay, ed., *Deism, Masonry, and the Enlightenment* (Delaware, 1987), pp. 61 - 78.

very much depended on both the occasion, and the extent and nature of the scholarly abilities possessed by competent divines.

Interestingly, Boyle's comprehensive list of the enemies of Christianity contains no mention of the most commonly perceived threat to true religion in England, *viz.*, the Church of Rome. This is a telling omission. Many of the divines closest to Boyle (Burnet, Stillingfleet and Tenison) expended vast quantities of literary energy polemicising against, and debating with, Catholic theologians. In view of the upheavals caused by the Romanising policies of James II, it is necessary to consider briefly the absence of Catholicism from the list, especially as Roman Catholicism was generally perceived to be the inevitable consequence of irreligion and dissent.⁷⁸ This problem can be resolved, in part, by considering the stipulation laid down by Boyle regarding the conduct of Christians toward one another in fulfilling their offices. There was to be no internecine controversy among Christians. A critical discussion of the Catholic question in the sermons would undoubtedly have drawn the Non-Jurors into the arena. Yet Boyle could not countenance the possibility of a charitable scheme of his own making becoming a venue for the promotion of factional programmes. According to the Non-Jurors the Anglican Church was schismatic, and it was they alone who had remained faithful to its original Oath of Allegiance to James II, whom they considered to be the divinely-ordained King and defender of the One, True, Catholic, and Apostolic Faith. Boyle could hardly have been unaware of this major threat to English Christian unity. Moreover considering the widespread and seemingly endless internecine quarrelling over toleration, moderation and comprehension, Boyle quite wisely added this restriction. The restriction was adhered to and the Lecturers maintained a silence on the various conflicts which dominated the ecclesiastical, theological and administrative activities of the Trustees in the decades following the death of Boyle. Boyle had chosen his list of enemies based on a lifetime of confronting the threats posed to the pious from both non-Christian and anti-Christian sources. Allied to this was his practical, scholarly and personal involvement in the Church. In the following

⁷⁸ A comparison between Boyle's will and Gilbert Burnet's highlights the absence of any mention of Catholics in the former's stipulations. According to his biographers, Burnet professed charity towards foreign Protestants and Dissenters 'and with these [he] would gladly co-operate against Atheism, Infidelity and Popery'. In his will he described 'Popery' as 'the greatest enemy to our Church, more to be dreaded than all other parties whatsoever'. Quoted in, *Life of Burnet*, p. 474.

sub-sections I will provide a brief account of the groups characterised by Boyle as ‘notorious Infidels’. In view of the fact that the construction of such a list of ‘enemies’ seems out of character for Boyle it is all the more significant to provide some account of why he produced it.

2. 4. 1. Atheists.

Boyle made no mention, by name, of any individual ‘notorious Infidel’. None of the usual list of despised villains - Hobbes, Spinoza, Machiavelli, Bruno, and Vanini - is referred to in the brief. The adjective ‘notorious’ is more than likely a literary commonplace. Although Boyle would have been familiar with those who had acquired infamy through their published works (and deeds) or through their ‘presence’ in London coffee houses.⁷⁹ The epithets in Boyle’s list have such a wide connotation that the perceived enemies of the Church - ancient, contemporary and possibly future - could all be accommodated and dealt with as the occasion demanded.

Atheism was seldom seen by Boyle and his contemporaries (without reservation) as a position arrived at *via* philosophical speculation. The term ‘speculative atheism’ was a rhetorical gratuity granted to those whose arguments were considered to be nothing more than a rehashing of classical theories.⁸⁰ Within this practice of orthodox polemics divines constantly reiterated the view that atheism can only be the product of a dissolute lifestyle and antinomian inclinations. It cannot be arrived at through any creditable formal process of reasoning and therefore the arguments put forward by the atheist were castigating as nothing more than attempts to conceal real motives. It was either lassitude, or perversity of the will and understanding, or grander schemes, to topple governments and the church, which were seen as the motivating force of atheistic publications. Boyle himself had already encapsulated this view in his *Appendix to the First Part of the Christian Virtuoso*:

if a man have a strong aversion from such or such a truth, or a great proneness to embrace the contrary error, his corrupt affections may prevail to make his intellect afford so much attention to all the proofs that favour an error, and may so take him off from sufficiently attending to the arguments that show it to be an error, that his understanding thus biased may really for

⁷⁹ Bryant Lillywhite, *London Coffee-houses: A Reference Book of Coffee-houses of the Seventeenth, Eighteenth and Nineteenth Centuries* (London, 1963).

⁸⁰ See chapter five below for further discussion on this issue.

the time assent to the error, and reject the truth, though when the mind comes to be *sui juris* again, it cannot rest in an erroneous assent, but must at length close with, and submit to a light, that it cannot always resist.⁸¹

It was almost impossible for seventeenth-century theories of the human mind to permit the possibility of a natural inclination to hold the belief that there was no God.⁸² David Berman supports this view in his discussion of the various Acts regarding unbelief passed in the latter half of the seventeenth century.⁸³ The 1697 'Act for the effectual suppressing of blasphemy and profaneness', according to Berman, has nothing to say on atheism as the denial of God, and is concerned with defending the Athanasian Creed against specific doctrinal attacks. Berman concludes that 'It seems to be implicit in the act that no one could be so utterly depraved as to be an atheist'. The previous, rather more clearly defined, act of 1678 stipulated that it was only someone 'visibly and apparently distracted out of his wits by sickness or natural infirmity, or not a mere natural fool, void of common sense' who could deny the being of God.⁸⁴

Dictionaries of the late seventeenth and early eighteenth centuries define an atheist as someone who denied the existence of God or the gods.⁸⁵ Johnson, for example, gives the usual definition but in his illustrative literary quotations, which provide exemplary uses of the term, we see the typical characterisation of atheism as

⁸¹ *Works*, vi. pp. We notice from this passage that Boyle refers to the 'proofs' offered for contrary views and the mind's 'assent' to them. Undoubtedly, he was aware that there was cognitive support for unorthodox or irreligious views. It was the persuasive force of this intellectual base which so distressed the young Boyle in his encounters with other faiths. The necessity of representing the 'proofs' for Christianity was one of the reasons for the lectureship.

⁸² See David Berman, *A History of Atheism in Britain: Hobbes to Russell* (London/New York/Sydney, 1988). However Berman's treatment of the problem of atheism in Freudian terms obscures the fact that atheism was the antithesis of the foundations of Christian doctrine and morality.

⁸³ Berman, *op. cit.*, pp. 35 ff.

⁸⁴ *Ibid.*, p. 37. See chapter five below for a critique of Berman's reductionist argument which considers the perception of atheism to be an illustration of Freudian repression.

⁸⁵ N. Baily, *Dictionarium Britannicum: Or a more Complete UNIVERSAL ENGLISH DICTIONARY Than any Extant . . .* (London, 2nd. ed., 1736); Ephraim Chambers, *CYCLOPAEDIA: or an Universal Dictionary of ARTS and SCIENCES* (2 vols., London, 1728); Elisha Cole, *An English Dictionary, Explaining the difficult terms that are used in Divinity, Husbandry, Physick, Philosophy, Law, Navigation, Mathematics, and the Arts and Sciences . . .* (London, 1692); John Harris, *Lexicon Technicum: or An Universal English Dictionary of Arts and Sciences* (vol. i, 1704, vol. ii, 1710, London); Edward Phillips, *The New World of Words: or Universal English Dictionary, 7th. ed., revised, corrected and improved . . . by J. K. Philobibl.* (London, 1720).

the result of a vicious life.⁸⁶ According to Bentley (one of Johnson's examples), an atheist is incapable of being 'a true friend, an affectionate relation or a loyal subject'. This view of the atheist did not prevent Bentley from engaging in lengthy scholarly treatments of its philosophical position which he outlined, with exemplary attention to detail and formal requirements, in his Boyle Sermons. Robert South, another of Johnson's examples, claimed that atheists 'are first vicious; and [then they] question the truths of Christianity, because they hate its practice'.⁸⁷

In the Boyle Sermons atheists were constantly castigated for their 'vicious lifestyles', while vast reservoirs of learning and argumentative skills were paraded to undermine their irreligious doctrines: vilifying opponents, by means of the techniques of ridicule, wit, and irony prior to undermining their arguments, was (and still is) good (or to be morally neutral, 'effective') rhetorical practice.⁸⁸ This display of a righteous use of tactics and materials, in exposing the absurdity of the atheists' claims, was predicated on the universal claim that the 'faculties' of the atheist were impaired. The 'weakness' of the spurious arguments of the irreligious, drawn from and indebted to the various *scientia*, was the consequence of a weakness in body and mind. The real danger, therefore, was the threat to lukewarm and credulous Christians, or those fascinated by the novelty or impishness of the various exotic heresies. Young adolescents were considered to be particularly vulnerable to this temptation.⁸⁹

The most sustained attack fell on the 'Epicurean hypothesis', which provided a rational and materialist account for the origin of the universe based on the principles of matter, motion and chance.⁹⁰ Epicureanism was, by the 1690s, the most

⁸⁶ Samuel Johnson, *A Dictionary of the English Language: In which the Words are Deduced From Their Origin and Illustrated In Their different Significations by Examples From the Best Writers . . .* (2 vols., London, 1825). q.v. 'Atheism'.

⁸⁷ Johnson, *op. cit.* On Robert South see, Gerard Reedy, *Robert South (1634 - 1716): An Introduction to his Life and Sermons* (Cambridge, 1992).

⁸⁸ John Redwood, *Reason, Ridicule and Religion: The Age of Enlightenment in England 1660-1750* (London, 1976).

⁸⁹ On the dangers to the youth see letters between John Byrom and his father in, R. Parkinson, ed., *The Private Journal and Literary Remains of John Byrom*, (4 vols., Manchester, 1854-57) *Chetham Society Remains*, 32, 34, 40, and 44; Ilana Krausman Ben-Amos, *Adolescence and Youth in Early Modern England* (New Haven/London, 1994), esp. 'Images of Youth', which covers spiritual biographies; Watkins, *Puritan Experience (passim)*.

⁹⁰ The concept of 'motion' and its attendant theological difficulties will receive further discussion in the chapter on Bentley.

fashionable anti-orthodox position in Augustan England. Furthermore, the crisis was exacerbated by the interest of orthodox divines in contemporary natural philosophy.⁹¹ The efforts of French and English philosophers - Descartes, Gassendi, Mersenne, Charlton and Evelyn - toward a programme of Christianising Atomism had removed the Epicurean assumption of an inherent activity essential to matter - an innate principle of power and motion. The Christian Godhead became the supreme source of all activity in the universe. Boyle and many other English natural philosophers were attracted to the corpuscularianism of the materialists whilst being aware of the attendant dangers of allowing matter to become a self-sufficient source for the production and maintenance of the world. The self-sufficiency of 'All Wise Nature', and the eternity of matter (as in Aristotelianism) were typical conceptual targets for orthodox attacks.⁹² The ancient traditions of natural theology played a useful role in contributing their own heritage of argumentative strategies which were derived from Lactantius and other early church fathers.⁹³ However, Boyle was critical of this inheritance and highlighted its shortcomings in 'proveing' Christianity against its critics:

for it seems to me, that most of the heathen philosophers, and several whole sects themselves, have in their framing their principles and tenets, and natural theology, that was grafted on them, considered the more obvious and familiar things, about which they were conversant, such as those corporeal

⁹¹ See, Walter Kargon, *Atomism In England from Hariot to Newton* (Oxford, 1966); George Depue Hadznits, *Lucretius and His Influence* (New York, 1935); C. T. Harrison, 'The Ancient Atomists and English Literature of the Seventeenth Century', *Harvard Studies in Classical Philology*, 45 (1934), 1 - 79. On the reason for the success of the Atomists in the sixteenth and seventeenth centuries see Christoph Meinel, 'Early Seventeenth-Century Atomism: Theory, Epistemology, and the Insufficiency of Experiment', *Isis*, 79 (1988), 68 - 103.

⁹² Boyle, in *Notion of Nature* (1686), provides a standard resume of the positions. Lynn Thorndyke tells us that Johann Christian Sturm became so alarmed at the 'chorus of adulation' for the concept of 'Nature' that he produced his *Idolum Naturae*, in which he argued that the concept undermined the sole authority of God. See Lynn Thorndyke, *A History of Magic and Experimental Science*, vii, p. 9.

⁹³ Lactantius *The Divine Institutes Books i - vii*. Translated by Sister Mary Francis McDonald, O. P. (Washington, 1964). There was an edition published in England in 1685. The topics of Lactantius show a striking similarity to many of the Boyle Sermon topics. For example, on the errors of the Atomists, iii, 17-25; on the necessity of a divine Revelation and the insufficiency of philosophy, iii, 26-30. See, James Edward le Rossignol, *The Ethical Philosophy of Samuel Clarke* (Leipzig, 1892), for the influence of Lactantius on Samuel Clarke. The church fathers were not the only sources for these standard topics - Cicero's *De natura deorum* contains all the standard arguments for divine activity based on a consideration of the created order.

objects, that affect the senses, and others that may be of importance, whether good or bad to human life and welfare.⁹⁴

This focus had, according to Boyle, produced systems not sufficiently capable of contemplating 'immaterial substances and abstracted beings'.

And it were to be wished, that a great number of Christian philosophers were less libel to the like censure. But I fear, that almost all, that have left us discourses of natural theology, whether after or before the preaching of the gospel, have given us what if you will pardon a rude expression, I shall venture to call a Creaturian theology; by which I mean a system of such definitions, notions, and articles as has been suggested by a consideration of the creatures, and chiefly, if not only, adapted to them, without being large enough to comprehend immaterial substances and abstracted beings, especially God himself and his divine perfections⁹⁵

In this passage, Boyle perceived how the enemies of Christianity could produce a religion of 'Nature' which was indistinguishable from traditional natural theology. The atheist or deist constructed, by means of identical vocabularies contained in the vast storehouses of classical learning and contemporary natural philosophy, a religion of nature, or a 'natural religion'. Boyle's aim in setting up the lectureship was to meet the enemies of Christianity with effective 'proofs' and thereby institutionalise a programme which had occupied him for most of his life. This programme had to be primarily a truly Christian undertaking, with the defence of immaterial substances given high priority. Natural theology, in its usual sense, was considered insufficient to this task - the kind of natural theology Boyle criticised provided proof for the existence of 'gods' or 'natural powers' not the Christian deity. It produced 'theists' - the second category in Boyle's list of notorious infidels - not Christians.

2. 4. 2. Theists.

This is one of the most difficult terms used by Boyle in his list of enemies as its range of denotation is even less precise than the term 'atheist'. For modern readers it is close to 'deist'. Although the dictionaries of the period agreed that the term 'atheist' signified one who did not believe in the existence of a God and who adhered to no religion, neither the 'true' nor the 'false', there is no entry for the term 'theist'. For example, Chambers defines 'atheist' as someone 'who does not believe

⁹⁴ *Appendix to the Christian Virtuoso, Works*, vi, p.705.

⁹⁵ *Ibid.*, pp. 705-6. In Chapter Four I will describe how the concept of a gravitational force provided Bentley with a much needed immaterial substance sanctioned by contemporary natural philosophy.

the Existence of God, nor a Providence, and who has no Religion, true or false'.⁹⁶ For the atheist, Chambers continued, there is no being superior to 'Nature' and for this reason he places Spinoza among the atheists and not among the deists. Thus an 'atheist' is any individual who does not accept the providential control and power of the Christian deity. The term 'Nature' in this case signifies, for Chambers, no more than 'mere Matter' and the atheist is synonymous with the materialist. Chambers and the other contemporary lexicographers attributed the basic principles of natural religion to 'deists' even though deists denied the necessity of a revelation from God. There was no middle ground occupied by 'theists' who may not have rejected a providential deity and were only critical of the institutional constraints imposed by a priestly caste who, they claimed, drew their sacerdotal power from tradition and political exigencies.

All contemporary dictionaries have entries for the term 'deist' and its cognates. They also have entries for the term 'pagan' and there seems to be some overlap between the connotation of the three terms, since pagans believed in 'the gods' but not *the* God of Christianity. The Deists were also accused of reviving the pagan religions for their own covert attacks on orthodoxy. Particularly in their attacks on the Christian priesthood the deists equated the imposture of the ancient priests and their multitude of gods with contemporary sacerdotal practice. Did Boyle, therefore mean 'deist' when he wrote 'theist'? Did Boyle coin the term?

An examination of the term in the *Oxford English Dictionary* shows that the term 'theist' was widely used in the seventeenth century. The usage varied from being an element in the construction of scurrilous retinues (produced by the orthodox) of 'Rebels, Theists, Atheists, Philologers, Wits, Masters of Reason, Puritnes [sic]' provided by Edward Martin, to equating the theist with the 'freethinker', as illustrated in the example from Roger North's *Examen*. Another more precise example is found in a sermon by William Outram, 'What theist was ever known to live according to the principles of natural religion?'⁹⁷ From these few examples we see that 'theist' was loosely used for the irreligious, the libertine and the deist.

⁹⁶ Chambers, *Cyclopaedia*, q.v. 'Atheist'.

⁹⁷ Edward Martin, Dean of Ely, was exiled during the Interregnum, see *Five Letters* (London, 1662). William Outram, *Twenty Sermons Preached upon Several Occasions* (London, 1682).

An explanation of Boyle's use of the term, along with an insight into his personal fears over this category, can be obtained from a discussion of two of Boyle's works which deal specifically with these issues - *A Free Inquiry into the Vulgarly Receiv'd Notion of NATURE; Made in an Essay, Addres'd to a Friend* (1686) and a work, first published in Birch's 1744 edition of Boyle's Works, intended as an addition to *The Christian Virtuoso*, the *Appendix to the First Part of the Christian Virtuoso*. In the *Notion of Nature* Boyle's main aim was to attack those who would make 'Nature' self-sufficient.

I know not, whether or no it be a prerogative in the human soul, that as it is itself a true and positive Being, so it is apt to conceive all other things, as true and positive beings also: but, whether or no this propensity to frame such kind of ideas supposes an excellency, I fear it occasions mistakes, and makes us think and speak, after the manner of true and positive beings, of such things, as are but chimerical, and some of them negations and privations themselves: as death, ignorance, blindness, and the like.⁹⁸

By means of a detailed investigation into Aristotle's and the Schoolmen's definitions of the term 'nature', and by illustrating the ambiguities attendant on the 'vulgar' usage, Boyle demonstrated how attributes and qualities became substantives. It is this process of substantivising which produces 'idolatry', the worshipping of Nature as a goddess. This, 'erroneous conceit defrauds the true God of divers acts of veneration and gratitude' and substitutes subordinate beings in His place. According to Boyle, 'modern *Aristotelians* and other philosophers [who] would not be taxed as injurious to providence', were guilty of postulating 'particular guidance [by] intelligent and immaterial beings . . . assigned to be the motives of the coelestial orbs'.⁹⁹ The real danger for Boyle in the Aristotelian (and Scholastic) notion of angelic movers in the celestial regions was stated more forcefully in the following passage from the *Appendix*:

For since *Aristotle* will have the universe, and consequently the heavens, to be eternal, and the celestial orbs to be moved west to east by these intelligences, these spirits must have been eternal too: and if so, they seem to be self-existent beings; and being also immortal, intelligent, and of vast power, what should hinder, but that Aristotle, and those that espouse his sentiments, must look on them as so many gods.¹⁰⁰

⁹⁸ *Works*, v, p. 161.

⁹⁹ *Ibid.*, p. 163.

¹⁰⁰ Boyle, in his *Notion of Nature*, would not allow an autonomous 'Nature' as this would create 'anomalies', making the destructive aspects of the creation subject to the arbitrary control of a mere

For Boyle, this was nothing other than 'polytheism'. The term 'theist' could therefore apply to any view which implied a threat to God's supreme control and government of the universe.

The above discussion may also help us account for the hostility of divines such as Stillingfleet to the Cambridge Platonists. The concept of 'plastic nature' and the rest of the Neo-Platonic divine hierarchy came dangerously close to the programme to deify nature by the deists: the concept 'all wise Nature' was a particularly suspect formulation. The circle of ecclesiastics within which Boyle moved considered the more mystical and pantheistic implications of the work of the Cambridge divines as a resource for deists such as Blount in argument for an 'Anima Mundi'.¹⁰¹ Many of the Boyle Lecturers attempted to show, in the way that Boyle had, that these terms were not true substantives and led to idolatry. Even the concept of 'attraction' was sometimes rendered suspect when given attributes normally significant of the deity. Any concept which could either demean the supremacy of the Christian God or suggest self-sufficiency was open to condemnation. Terms associated with the new philosophy were particularly vulnerable, especially those which had their origin in Atomism: 'conatus', 'will', 'endeavour', 'inertia', and 'clinamen' (the Epicurean concept of 'swerve'), were all capable of heretical connotations.¹⁰² The 'theist' was someone who could substitute

'viccgerent'. In the later debates between Leibniz and Samuel Clarke these issues were the focus of the former's criticism that Newton treated 'space' as a real, eternal and positive being. According to Leibniz the crude metaphysics of the 'English' philosophers resulted in idolatry. See, H. G. Alexander, *The Leibniz-Clarke Correspondence* (Manchester, 1956).

¹⁰¹ Susan Rosa, 'Ralph Cudworth in the *Republique des Lettres*: the Controversy about *Plastic Nature* and the Reputation of Pierre Bayle', in *Studies in Eighteenth Century Culture*, 23 (1994), 147-60. See Charles Blount's *Anima Mundi: or, an Historical Narration of the Opinions of the Ancients concerning Man's Soul after this Life: according to Unenlightened Nature* (London, 1679) for a paradigmatic use of Pagan literature by a deist.

¹⁰² In the *General Scholium* (added to the 2nd. ed. of the *Principia*, 1713) Newton continued the widespread concern over the use of substantives for modal or qualitative categories: '[God] is not eternity and infinity, but eternal and infinite; he is not duration or space, but he endures and is present'. On the other hand, the continuation of this passage demonstrates his concern with the materialist implications of his own position. Newton was at pains to weaken the relation of identity in the phrase 'God is X'. God, for Newton, 'constitutes' space and duration but is not identical with these; 'space' and 'time' are described as 'modalities' of God's extension and duration. Newton's efforts to distance himself from any taint of reification notwithstanding, Leibniz charged him with materialising terms such as 'space' and 'time' by demanding that God's omnipresence must be 'not virtually only, but also substantially' present to His material creation. These were not simply scholastic exercises in the manipulation of terminology, and the materialist threat would continue to plague metaphysical and theological definition. See, *Sir Isaac Newton's Mathematical Principles*

any of these terms, and a host of others, for the orthodox concept of the triune God. Classical and pagan sources provided alternatives to Christian accounts of the origin of the universe and for the controlling agencies which maintained order. Boyle was fully aware of this particular threat in view of the activities of More and the other Platonists, who, undoubtedly, were all well-intentioned Christian apologists.¹⁰³

2. 4. 3. Pagans.

Although contemporary dictionaries have entries for the term 'pagan' they do not provide much more than the perfunctory definition that a pagan was someone who worshipped the ancient heathen gods. The conflicts and tensions generated by Christianity's attitude toward pagan learning are as old as Christianity itself. The literature describing that relationship is vast and the present discussion must of necessity be rather brief and narrowly focused.¹⁰⁴ What is of primary importance is the way in which antiquity was exploited, by both the enemies and the defenders of Christianity, to bolster arguments by means of a display of materials which had attained institutional and cultural status as 'autoritas'.¹⁰⁵ Boyle perceived the inherent danger in this since he believed that the sources which were intended purely as supplementary material could, in the wrong hands, become ends in themselves. As I have already pointed out, in the case of Henry More, the unity and supremacy of the triune Godhead was at risk. His proliferation of spirits and seminal principles in the

of Natural Philosophy and His System of the World, Andrew Motte's translation (1729), revised by Florian Cajori, (2 vols., Berkeley/Los Angeles, 1966) pp. 543-47.

¹⁰³ Anthony Grafton, *Defenders of the Text*, pp. 17 - 21; R. A. Greene, 'Henry More and Robert Boyle on the Spirit of Nature', *J. Hist. Ideas*, 23 (1962), 451-74; John Henry, 'Occult Qualities and the Experimental Philosophy: Active Principles in pre-Newtonian Matter Theory' *History of Science* 24 (1986), 335-81; *idem.*, 'Henry More versus Robert Boyle: the Spirit of Nature and the Nature of Providence', in Sarah Hutton, ed., *Henry More (1614-87): Tercentenary Studies*, (Dordrecht, 1990), pp. 55 - 76; Sarah Hutton, 'Edward Stillingfleet, Henry More, and the Decline of Moses Atticus: A Note on Seventeenth-Century Apologetics', in W. R. F. Kroll, ed., *Philosophy, Science, and Religion in England 1640-1700* (Cambridge, 1992), pp. 68 - 84

¹⁰⁴ Clarence J. Glacken, *Traces on the Rhodian Shore* (Berkeley, 1967); Cyrus H. Gordon, *The Common Background of Greek and Hebrew Civilisation* (New York, 1965); E. J. Kenney and W. B. Clausen, eds., *The Cambridge History of Classical Literature* (Cambridge, 1982); L. D. Reynolds and N. G. Wilson, *Scribes and Scholars: A Guide to the Transmission of Greek and Latin Literature* (3rd. ed., place, 1991); Charles B. Schmitt, *Aristotle and the Renaissance* (Cambridge, Mass., 1983); *idem.* *The Aristotelian Tradition and Renaissance Universities*, (London, 1984); Jean Seznec, *The Survival of the Pagan Gods*, (Princeton, 1953); W. W. Wagar, ed., *The Secular Mind* (New York, 1982). Roberto Weiss, *The Renaissance Discovery of Classical Antiquity* (Oxford, 1969).

¹⁰⁵ On the notion of 'authority' in relation to scriptural texts, see Stephen Prickett, *Words and the Word: Language, Poetics and Biblical Interpretation* (Cambridge, 1986).

highly mystical language of Neoplatonism caused concern among certain divines. More presented an orthodox usage of pagan learning, as a defence against materialism, and in the process materialised his 'Spirit of Nature'.¹⁰⁶ Boyle's *Free Inquiry* can be seen as an attempt to control the substantivising of spiritual agencies particularly by the friends of Christianity.

Stephen Gaukroger summarises the contest for control over pagan materials.¹⁰⁷ He describes how the relationship of seventeenth-century Christians with antiquity ought to be approached by historians of early modern Europe. It was a 'fund of ideas' and strategically useful 'as a source of evidence' to protagonists, who constructed their polemics from this reservoir. In other words they put antiquity to work in contemporary debates. Alternatively, Peter Gay presents the use of antiquity as a confrontation between the ancients and the moderns and tells the story of the victory of the latter over the former.¹⁰⁸ However, Gay's portrayal, as Gaukroger points out, fails to 'face up to the way the past was used in the sixteenth and seventeenth centuries'.¹⁰⁹ The past was extensively utilised to undermine the positions of opponents by those called 'moderns' as well as by those called 'ancients'. Bentley is the paradigm example of a 'modern', in terms of the ancients and moderns debate, who was a professional in pagan literature, who utilised modern and ancient natural philosophy in defending Christianity from 'modern pagans', and who also pitted the ancients against each other when the situation demanded that tactic. His praise of Newton, as the one who had finally demonstrated the truth of Democritus' atomism, is a revealing example of the appropriation of an ancient system on behalf of orthodoxy. This tactic was also applied by Joseph Glanville in *A Letter to a Friend Concerning Aristotle* (1665). According to Glanville,

¹⁰⁶ 'The spirit of Nature . . . is a substance incorporeal, but without Sense and animadversion, pervading the whole Matter of the Universe and exercising a Plastical power therein, according to the sundry predispositions and occasions in the parts it works upon, raising such Phaenomena in the World, by directing the parts of the matter and their Motion, as cannot be resolved into mere mechanical powers.' More, *The Immortality of the Soul* (in *A Collection of Several Philosophical Writings*. . .), quoted, in Serge Hutin, *Henry More. Essai sur les doctrines theosophique chez les Platoniciens de Cambridge* (Hildesheim, 1966), p. 127.

¹⁰⁷ Stephen Gaukroger, ed., *The uses of Antiquity: The Scientific Revolution and the Classical Tradition*, (Dordrecht/Boston/London, 1991), esp., 'Introduction: the Idea of Antiquity', pp. ix - xvi.

¹⁰⁸ Peter Gay, *The Enlightenment: an Interpretation* (2 vols., London, 1970).

¹⁰⁹ Gaukroger cites Voltaire's summary representation (in *Dictionnaire Philosophique*) as the source for this mythological image of 'victory over the ancients', see *op. cit.*, p. ix.

that *Aristotle* dealt so *invidiously* with the philosophers that were before him, will not need much proof to one, that is but indifferently acquainted with his writings. The great Lord *Bacon* hath particularly charged him with this unworthiness in his excellent *Advancement of Learning*, wherein he says, that '*Aristotle* as though he had been of the race of *Ottomans*, thought he could not reign, except that the first thing he did, he kill'd all his Brethren'¹¹⁰

Glanville was attempting to replace Aristotle with the more ancient system of Democritus and to offer the latter as more worthy of our esteem and veneration.

The *Aristotelian* was not the antient *Philosophy*, but the *Corpuscularian* and *Atomical*, which to the great hinderance of Science lay long buried in *neglect* and *oblivion*, but hath in these latter Ages been restored to the *light* and it's deserv'd *repute* and *value*. And that the *Atomical Hypothesis* was the *First* and most *Antient*, of which there is any memory in *Physiology*, is notoriously known to all, that know the Age of *Democritus*.¹¹¹

The 'New Philosophy' was, as Bacon had claimed, a restoration of traditions which had, in Glanville's view, been obscured by 'a spurious medley of nice, spinose, and useless notions'. This was the invention of a respectable genealogy as an alternative to the schools and not the rejection of the ancients *en masse*. Unfortunately these debates fuelled the unorthodox perception of the possibility of systems of knowledge independent from the Christian lineage. The literature of the pagans was used to establish the principles of a 'natural religion' which could provide moral sanctions, as it had in the past, outside the Christian dispensation. For this reason strict attention must be given to the function of the ancient sources in any specific text: this will avoid the characterisation of those divines, competing for control of this material, as constructing a natural religion when their actual task was to demonstrate the insufficiency of such a system. This competition for the control of non-Christian resources will receive further treatment in the discussions on individual performances of the Boyle Sermons.

2. 4. 4. Jews.

Boyle informs us, in the autobiographical *An account of Philaretus*, how whilst staying in Florence, he encountered 'the Company of certaine Jewish Rabbins lodg'd under the same roof...[this] gaue him the opportunity of acquainting himself

¹¹⁰ Joseph Glanville, *A Letter to a Friend Concerning Aristotle, appended to Scire/e tuum nihil est: or, The Author's Defence of the Vanity of Dogmatising* . . . (London, 1665). pp. 84 - 5, quoted in, Gaukroger, *op. cit.*, pp. x-xi.

¹¹¹ Gaukroger, *op. cit.*, p. xi.

with diuers of their Arguments & Tenents, & a Rise of further Disquisitions'.¹¹² Prior to this encounter Boyle had undergone a period of intense doubting elicited by a visit to the Swiss mountains. Those 'Wild Mountains' allowed the 'Deuil' to take advantage of a 'deepe, rauing Melancholy' brought on by his 'humor, & the st[r]ange storys & Pictures' which he found during a visit to a Carthusian monastery. This combination of events resulted in

such strange & hideous thoughts, & such distracting Doubts of some of the Fundamentals of Christianity/Religion;/ that tho his lookes did little betray his Thoughts, nothing but the Forbiddenesse of Self-dispatch, hindred his acting it.¹¹³

On receiving the sacrament Boyle soon recovered and he tells us how from this troublesome experience he derived 'the Aduantage of Groundednesse in his Religion'. However, from that point on he claims that 'the perplexity' into which he was thrown drove him to

be seriously inquisitiue of the Truth of the very fundamentals of Christianyty: & to peruse what both the Turkes, & Jewes, & the cheefe Sects of Christians cud alledge for their seuerall opinions.¹¹⁴

Boyle's adherence to the 'true' religion demanded an examination into those faiths which although considered to be 'false' by all faithful Christians, were not lacking in solid conceptual and formal 'proofs'. It was ever important for Boyle that even in those doctrines for which no reason could be given for 'What we beleue', it was necessary that, 'we shuld be euer able to giue a Reason Why we beleue it'.¹¹⁵

Boyle's inclusion of the Jews in his list of 'enemies', I suggest, is an extension of his early exercises in grounding his religion on the solid base of 'Right Reason'. It is important that we do not associate this with a rationalising of the Christian mysteries. This section will also attempt to show that it is necessary to distinguish between the defence (or 'proof') of doctrinal positions against the systematic claims

¹¹² Maddison, *op. cit.*, p. 40.

¹¹³ *Ibid.*, p. 34 - 5.

¹¹⁴ *Ibid.*, p. 35

¹¹⁵ *Ibid.*, p. 35. On the notion of 'right reason' see Lotte Mulligan, *op. cit.*, *passim*. My one reservation about this excellent paper is her concentration on Anglicanism to the neglect of the Puritan notion of 'experimental religion'. On the changes to the terms 'reason' and 'right reason', see, Christopher Hill, "Reason' and 'Reasonableness'", in, *Change and Continuity in Seventeenth-Century England* (Cambridge, Mass., 1962); John Spurr, "Rational Religion' in Restoration England', *J. Hist. Ideas*, 50 (1989), 563 - 85.

of other systems and the toleration of communities adhering to alternative faiths. Boyle had encountered the scholarly defence of alternative forms of religious doctrine and behaviour during his continental tour and this was to leave him with an awareness of the need for powerful intellectual resources in the defence of his own religion. These requisite intellectual weapons were never, for Boyle, a substitute for an experiential piety founded on Scripture and 'Right Reason'. Boyle's anxieties were certainly exacerbated by encounters with those who could competently defend their 'infidel' theologies using similar tactics and resources which he had been acquiring at the hands of his tutor Isaac Marcombes. It is highly unlikely that the young Boyle - his already legendary studiousness notwithstanding - could have maintained a successful defence against learned Rabbis and fully trained Jesuits.¹¹⁶

Several years after his early meetings with Jewish scholars Boyle visited the Netherlands. In Amsterdam he visited Menasseh ben Israel whom he described as 'the Greatest Rabbi of this Age'.¹¹⁷ According to Richard Popkin Amsterdam had a flourishing scholarly Jewish community producing anti-Christian tracts for circulation within that community.¹¹⁸ Many of these scholars had been raised in Christian communities in the Iberian peninsula and were consequently familiar with the intellectual traditions used to support Christianity. These dissatisfied *conversos*, who found themselves in relative freedom in Amsterdam, returned to the practice of Judaism and the publication of anti-Christian polemical texts. Ironically because they had studied at Christian institutions in Spain and Portugal they were unfamiliar with Hebrew and had no acquaintance with traditional Jewish education.¹¹⁹ This gave their polemical attacks on Christianity an added sting in that they drew on resources other than the Talmudic or traditional rabbinical material. It is safe to conjecture that Boyle would have familiarised himself with these activities through his encounter with Menasseh ben Israel even though most of this polemical literature was unpublished, only circulating within the Jewish community and among Christians with

¹¹⁶ The autobiographical, *An account of Philaretus*, discusses Boyle's early studies. Maddison, *op. cit.*, pp. 2 - 56, contains the full version.

¹¹⁷ *Ibid.*, p. 73; also *Works*, ii, p. 18, where Boyle calls him 'my learned acquaintance'.

¹¹⁸ Richard H. Popkin, 'Jewish Anti-Christian Arguments as a Source of Irreligion from the Seventeenth to the Early Nineteenth Century', in, Hunter and Wootton, *op. cit.*, 158 - 81.

¹¹⁹ Popkin, *op. cit.*, p. 164. Menassch ben Israel did begin printing in Hebrew at Amsterdam

whom they engaged in personal disputation.¹²⁰

Polemics were not the only experience which Boyle had whilst in Amsterdam. He also witnessed the practice of toleration extended to all communities on the proviso they did not scandalise the Dutch legal citizenry. Locke formed the same impression of certain cities in the Netherlands and wrote to Boyle praising the tolerant attitude of the Dutch authorities. More than a decade after Boyle's visit the English government, during the Protectorate, considered overtures from Menasseh ben Israel for the readmission of the Jews to England.¹²¹ The movement for readmission gained the support of Oliver Cromwell and, in a series of meetings at Whitehall, it was decided that there was no legal reason to continue to exclude Jews from residency in England. However agitation from those opposing readmission resulted in nothing concrete being decided. One of the causes which eventually tipped Cromwell into positively granting permission for the Jews to establish a synagogue and cemetery in London was the war with Spain and the position of Marranos resident in England who were at risk of being considered enemy aliens. The alternative was to reveal their adherence to Judaism (rather than be suspected as a Catholic fifth-column) which they did in a petition to Cromwell, a petition that he finally granted.

The presence of the Jews in England raised further hopes over and above the pleas for toleration and naturalisation by Englishmen such as Locke - the hope of converting the Jews to Christianity and 'restoring' the Jewish people to Palestine.¹²² The hope that the prophesied conversion of the Jews would be fulfilled resulted in an ambiguous attitudes toward other faiths, apparent in scholarly works of the period, where Jews and Muslims were tolerated as a social element, subject to the same

¹²⁰ See letters between Locke and Limborch, in E. S. de Beer, *Correspondence of John Locke* (8 vols., Oxford, 1976), iii, letter nos. 958, 959, 963, and 964, all written in Sept. 1687.

¹²¹ There is not space to consider the economic advantages to be gained from the readmission of the Jews. It was obviously more convenient to have wealthy Jewish merchants and professionals aligned with Protestant England than with Catholic Spain. The commercial advantage was noticed at the time. Jonas Proast in his, *The Argument of the Letter Concerning Toleration* (London, 1690) castigated toleration as an excuse for the 'Advancement of Trade and Commerce (which some seem to place above all other Considerations)', cited in Nabil I Matar, 'John Locke and the Jews', *Journal of Ecclesiastical History*, 44 (1993), 45 - 62; *idem.*, 'The Idea of the Restoration of the Jews in English Protestant Thought: 166 - 1701', *Harvard Theological Review*, 78 (1985), 115 - 48.

¹²² On the conversion of the Jews see, Christopher Hill, 'Till the Conversion of the Jews', in, Richard H. Popkin, *Millenarianism and Messianism in English Literature and thought 1650-1800* (Leiden/New York/Kobenhavn/Koln, 1988), pp. 12 - 36.

judicial privileges as all English citizens whilst their theologies were considered false and dangerous. In some cases they were allowed to live more freely than Dissenters, especially in the post-Restoration period which saw the return of a draconian episcopacy. This freedom for non-Christians to move undisturbed commercially and socially, whilst their theologies were not condoned as viable alternatives, is an important consideration regarding Boyle's inclusion of Jews in his list. According to Matar, Locke

implicitly agreed that men who subscribed to different religions could not be expected to change their beliefs just because they resided within the territory of a Christian monarch. But having so affirmed, he hastened to add that although he accepted non-Christians in a Christian state, he did not approve of their religions.¹²³

Thus Locke's attitude, and the attitude of many others, was conversionist. The conversion of the Jews formed part of Christian eschatology and was one of the elements in Interregnum millennialist preaching and doctrine. This millennial expectation was not confined to the more radical Puritan divines but spread across the spectrum of English Christian thought, including those groups of which Boyle was an intimate correspondent and in some cases an active participant. For example, one of the projects outlined by Samuel Hartlib, in his scheme for a university, was 'For Conversions or correspondency of Jews and advancement of Oriental Language and Learning.'¹²⁴ Hartlib was by no means alone in his recognition of the advantages to learning to be obtained by scholarly 'correspondence' with the Jews. Matar points out that later in the century there was strong institutional support for oriental scholarship by both English universities and, in 1663, Cambridge commissioned Rabbi Isaac Abendana to translate the Mishna into Latin. Abendana, according to Matar, wrote frequently to Robert Boyle, Henry Oldenburg and Edward Pococke.¹²⁵

Boyle's relationship with Jewish learning formed part of a highly complex network of schemes for the advancement of learning and the acquisition of alchemical, cabalistic, medical and antiquarian sources. This unconstrained approach to the appropriation of universal 'pansophy' had unacceptable side effects. The

¹²³ *Op. cit.*, p. 47.

¹²⁴ Charles Webster. *Samuel Hartlib and the Advancement of Learning* (Cambridge, 1970), p.60.

¹²⁵ Matar, 'Locke and the Jews', p. 49. Locke is discussing Boyle's acquisition of a copy of the *Kabbala Denudata* by Christian Knorr - he also discussed the general trade in Hebrew books carried on by Oldenburg and Boyle.

example of the Cambridge Platonists has already been referred to and the resultant antagonism to pagan learning from the circle of divines who came to power with the advent of the Revolution of 1688/9. The Old Testament and ancient Hebrew had long held positions as historical elements in the narrative of Christian sacred history; the religion of the Israelites prefigured the Christian dispensation and Hebrew was of course the original and divine means of communication between God and humanity. The Jews were perceived, therefore, as custodians of an ancient theology which Christians considered to have been forfeited by the refusal, on the part of the chosen people, to accept Christ as the Messiah.¹²⁶ Robert M. Healy sums up this historical perception on the part of seventeenth-century 'Puritans':

because the Old Testament was the history of a people now living out the consequences of their apostasy, it became the lens through which the Puritan viewed all history, the fundamental principle of interpretation by which to understand mankind, the church, one's own nation and one's self. To him, the whole sorry and simultaneously hopeful story of the Jews, their election, covenant, apostasy, and rejection and their potential forgiveness, reconciliation, and redemption applied to all human beings.¹²⁷

The involvement with Jewish learning on the part of Boyle, Newton, Henry More, the philologists and antiquarians of both universities, and many of the members of the Royal Society was simply a continuation of the perception on the part of these scholars that their God was the God of Abraham and Moses. The original revelation of all natural and supernatural knowledge had been given to the Jews in the ancient, and primary, language of Hebrew.¹²⁸ The Jews were a crucial element in the restoration of universal learning and piety. The restoration of the English nation, in the sight of God, as the locus for a truly Reformed primitive Christianity, required the conversion and 'restoration' to Palestine of the Israelites.

This support for the restoration of the Jews is significant for the defence of Christianity as outlined in Boyle's will. As Matar points out it was not strictly

¹²⁶ This forms the substance of Richard Kidder's Boyle Sermons delivered in 1693, see Letsome and Nicholl, *op. cit.*, i, pp. 89 - 152.

¹²⁷ Robert M. Healy, 'The Jew in Seventeenth-Century Thought', *Church History*, 46 (1977), 63 - 79.

¹²⁸ John Gascoigne, 'The Wisdom of the Egyptians' and the Secularisation of History in the Age of Newton', in Gaukroger, *op. cit.*, pp. 171 - 212. Also very useful, Richard H. Popkin, 'The Crisis of Polytheism and the Answers of Vossius, Cudworth, and Newton', in James E. Force and Richard H. Popkin eds., *Essays on the Context, Nature, and Influence of Isaac Newton's Theology* (Dordrecht/Boston/London, 1990), 9 - 26. Still extremely useful is Frank E. Manuel, *The Religion of Isaac Newton* (Oxford, 1974), esp. pp. 68 - 9.

connected with the Jews as a community 'but as a biblical factor in the conflict between theologians and deists'. The deists, by using non-Christian sources, attempted to undermine the privileged status of the Christian dispensation and the unique truth of the Scriptures. The accomplishment of scriptural prophecies such as the conversion and restoration of the Jews would provide empirical evidence for the credibility of sacred history. In a sense it would have been an '*experimentum crucis*', corroborating Christian hegemony over all historical narratives, Pagan and Jewish. Once again, I must stress, this was not a 'rationalising' of Christian doctrine due to a burgeoning cultural emphasis on the supremacy of reason. Rational argumentation by the deists, directed at the failure on the part of Christian exegetes to demonstrate the providential presence of God throughout history, was answered, not by capitulating to rationalism, but by the reappropriation of the weapons derived from non-Christian sources. In the sections below, where I deal with individual divines and sermons, some of these issues will receive further treatment. So far I have shown how the tensions generated by the presence of non-Christian communities, are not the same as those resulting from the acquisition, and exploitation, of the scholarly resources of those communities. The latter purely scholarly activities carried with them the possibility of conversion to heretical and infidel theologies: the presence of non-Christian communities was a matter of 'toleration'. The inclusion of Jews in Boyle's list of 'notorious Infidels' was more likely to have been the result of unacceptable theologies than unacceptable communities, and the recognition of what the opponents of Christianity, and ironically the defenders, were doing with Pagan and Jewish learning.¹²⁹ Once again Boyle had an eye on the weaker sort of Christian, easily seduced by alien concepts and easily shaken in an ungrounded faith by the 'proofs' of alien theologies.

¹²⁹ On Henry More's retreat from the 'Kabbalistic Christianity' of Francis Mercury van Helmont, see Allison Coudert, 'A Cambridge Platonist's Kabbalist Nightmare', *J. Hist. Ideas*, 36 (1975), 633 - 52. According to Coudert this caused a slight rift in the legendary friendship between More and Lady Ann Conway. As More came to realise the dangers for Christianity inherent in Helmont's programme Conway's interest grew deeper. Ironically it was Helmont's mission to use the Kabbala to provide a 'firm foundation for a universal religion, embracing Catholics, Protestants, Jews, and pagans.' Coudert, *ibid.*, p.635. For further insight into the relationships between More, van Helmont and Lady Ann Conway see, Marjorie Hope Nicholson, ed., *The Conway Letters; The Correspondence of Anne, Viscountess Conway, Henry More, and their Friends 1642 - 1684*. Revised Edition with an Introduction and New Material, Edited by Sarah Hutton (Oxford, 1992).

2. 4. 5. Mahometans.

Part of the reason for the large literature on Islam produced in England in the sixteenth and seventeenth centuries was the growing interest - outside the arenas of militarist and economic expansionism - in the cultures, beliefs, and customs of non-European societies.¹³⁰ With the advent of travel and peaceful commercial expansion, involving increased trading with the merchants of the Levant, came exposure to other forms of theological doctrines and spiritual practice. This resulted in the necessity to protect Christians from the inability to defend their own systems against equally systematic structures couched in recognisable formulae. Pailin says, that over and above mere curiosity,

interest in Islam during this period seems to be aroused by the suspicion that the standard arguments for the truth of the Christian Revelation, in some cases at least, use the kind of evidence that can also be found, *prima facie*, in the case of Islam.¹³¹

Responses to Islam in the seventeenth century vary between outright condemnation and vilification both of the doctrines and the person of Mahomet and the defence of Islam within a covert attack on the singular claim of Christianity's custodianship of the Revelation of God's Word.¹³² Knowledge of Islam varied, yet the overall result was one of distortion (deliberate or customary), inherited errors, rumours and calumnies. At the same time many scholars in England, of the stature of Edward Pococke who produced his *Specimen Historiae Arabum* in 1649, attempted to correct these widespread misrepresentations. The scholarly plea for a knowledge of Arabic and for more trustworthy translations of Mahometan texts were considered necessary for the genuine defeat of Islamic doctrines. Also the perception that some articles of belief were held in common and that these doctrines could be assimilated to a common origin which accounted for all similarity, by locating them in Jewish sources, required urgent resolution in favour of the uniqueness and hegemony of the Christian dispensation. Pailin quotes More to illustrate this very point: 'Henry More...comments that the Muslims have been called '*Semichristiannos*' since much

¹³⁰ David Pailin, *Attitudes to Other Religions: Comparative Religion in Eighteenth and Nineteenth-Century Britain* (Manchester, 1984), esp. pp. 81 - 104.

¹³¹ *Ibid.*, p.81.

¹³² I have used the usual spelling of the Prophet's name provided in contemporary texts.

of their 'Law' comes from Moses and Christ'.¹³³ However much Christians might incorporate what was praiseworthy in Islam the real problem, according to Pailin was 'the way in which the kind of evidence used in arguments to prove the truth of the Christian Revelation may, *mutatis mutandis*, be held to be found also in Islam'.¹³⁴

Boyle's early contact with 'Turkes' and his subsequent consideration of their arguments in order to 'Ground' his own religion reflects Pailin's conclusions. Although Boyle did not engage in vilification and condemnation of Muslim doctrines or the person of Mohamet, his responses were either missionary or defensive. His efforts to protect Christian travellers can be seen in his financial support for a translation of Grotius's *De Veritate Religionis Christianae* by Pocock, the learned orientalist, and in his donations to a project to translate the Bible into Arabic.¹³⁵ Although these were 'missionary' projects, as Maddison points out, it is important to bear in mind the nature of Grotius's intentions for his work which was a manual for seafarers and travellers who would come into contact with other faiths and thus be subjected to possible doubts as to the uniqueness of their own.

I have alluded to the problems produced by a similarity in defensive tactics of the three major faiths - Judaism, Christianity and Islam. The claims for divine origination as the primary sanction for the authority of these faiths were located in the common area of the miraculous. However, this fundamental criterion, which all revealed religions adhere to, rests on the claim to the miraculous status of the originators, and any subsequent divine messengers.¹³⁶ The support of Valentine Greatrakes's healing powers by Henry Stubbe serves to illustrate Boyle's fears, especially those connected with the uniqueness of the miracles of Christ as evidence for his divine authority.¹³⁷ Boyle's fears were subsequently realised by an increase in

¹³³ *Ibid.*, p.85.

¹³⁴ *Ibid.*, p.85.

¹³⁵ Maddison describes how the translation was produced 'for the purpose of advancing missionary efforts among the Arabs, and received high commendation from Hartlib, Worthington and Richard Baxter', *op. cit.*, p. 96. Birch tells of Boyle's communication with a 'gentleman in the Levant' to whom he sent several copies of Grotius's work *De veritate Religionis Christianae*. Boyle comments that the work was written 'first and chiefly designed for the conversion of infidels'. See, Boyle, *Works*, i, p. ci.

¹³⁶ Pailin, *op. cit.*, gives a survey of the major areas of contention between Christians and Muslims.

¹³⁷ On Greatrakes see. Eamon Duffy, 'Valentine Greatrakes, the Irish Stroker: Miracle Science and Orthodoxy in Restoration England' *Studies in Church History*, 17 (1981), 251 - 73; R. A. Hunter and Ida Macalpine, 'Valentine Greatrakes', *St. Bartholomew's Hospital Journal*, 60 (1956), 361 - 8;

the number of those who endangered Christianity by subjecting the major faiths to a relativising programme. The row between Boyle and Stubbe - who utilised Islam in just such a programme - explains the inclusion of Islam in the codicil.

According to Birch

Mr. Stubbe, who was witness to several of his [Greatrakes] cures in Warwickshire, published therefore at Oxford in 4to, a piece, entitled, *The Miraculus Conformist: or, An Account of several marvellous cures performed by the stroking of the hands of Mr. Valentine Greataricks [sic]; with a physical Discourse therupon, in a Letter to the honourable Robert Boyle, Esq; with a letter relating to some of his other miraculous Cures, attested by E. Foxcroft, M.A. and fellow of King's college in Cambridge.* Mr. Stubbe's letter to Mr. Boyle is dated at Stratford upon Avon, February 18. 1665 - 6. ¹³⁸

This letter and Boyle's rejoinder to Stubbe provide a remarkably coherent locus for many of Boyle's fears regarding the attacks on the uniqueness of Christianity. Stubbe had presented the healing acts of Greatrakes as miraculous. The 'effects fill with admiration the most learned or suspicious beholders'; neither is Greatrakes dependant on the ignorant or the superstitious; his own character and the characters of the witnesses are beyond reproach. The sting comes in Stubbe's claim that the soul of Greatrakes seemed to contain 'some grains of the golden age, and to be a relick of those times, when piety and miracles were sincere'. This is followed by the 'suggestion' that

God had bestowed upon Mr. Greatrakes a peculiar temperament, or composed his body of some particular ferments, the effluvia whereof being introduced by a light, sometimes by a violent friction, should restore the temperaments of the debilitated parts, reinvigorate the blood, and dissipate all the heterogeneous ferments out of the bodies of the diseased, by the eyes, nose, mouth, hands, feet. ¹³⁹

Reading between the lines Boyle drew the obvious conclusions intended by Stubbe, the equating of the miracles of Greatrakes with those of Christ and the Apostles, followed by a naturalistic causal explanation. Boyle was also piqued by Stubbe's deployment of corpuscularianism as the basis for his physical reductionism as it was

B. B. Kaplan, 'Greatrakes the Stroker: the Interpretations of his Contemporaries', *Isis*, 73 (1982), 178 - 85.

¹³⁸ Boyle, *Works*, i, p. lxxv. See also J. R. Jacob, *Henry Stubbe, Radical Protestantism and the Early Enlightenment* (Cambridge, 1983); J. A. I. Champion, *The Pillars of Priestcraft Shaken: The Church of England and its Enemies, 1660-1730* (Cambridge, 1992), pp. 120 - 25.

¹³⁹ Birch, *op. cit.*, p. lxxvi.

publicly known that he adhered to this position.¹⁴⁰ However the main ‘theological’ point which Boyle addressed was the relativising of the miraculous as something common to all religions:

In the opinion you hold as *an undoubted truth, that God had permitted all religions to have their real miracles*, I do very much dissent from you . . . speaking as you do indefinitely of all religions, and taking real miracles as such exertions of God’s power, as are above the power of creatures, I am so very unapt to believe the storics of the Turkish, Heathenish, and other miracles pretended to by divers enemies of the Christian religion in confirmation of theirs. ¹⁴¹

Boyle was outraged that his name was used in a publication which asserted that all religions, including the ‘Mahometan’ were purveyors of the miraculous and that these miracles have a corpuscularian explanation. Boyle further insisted that if Stubbe had shown him the letter prior to publication he would have been able to dissuade him from publishing. He also alluded to other occasions when Stubbe’s ‘meddling with theological matters’ had done him harm, pointing out that he ought not to have addressed such a publication to him ‘who [had] publicly given cause to think it must be peculiarly unwelcome to [him]’.¹⁴²

Stubbe went on to compose ‘An Account of the Rise and Progress of Mahometanism’ in 1671. It remained in manuscript form and was circulated covertly in the early eighteenth century¹⁴³ It continued the arguments of the letter to Boyle and the standard deistic treatment of all religions as an ‘imposture’ by politically astute leaders such as Moses, Christ, Mahomet, Solon, and Lycurgus. According to the deists these leaders had introduced moral imperatives disguised as supernaturally revealed religious injunctions. Once again the relativising and naturalising of religious mysteries into a universal natural religion was perceived by Boyle as the main threat to a virtuous life which could only be grounded in the supernatural and experiential performance of a ‘holy life’.

In placing the bequest for the Lectureship within the context of Boyle’s piety

¹⁴⁰ For an interesting discussion on the relationship between the miraculous and the experimental philosophy, see Peter Dear, ‘Miracles, Experiments and the Ordinary Course of Nature’ *Isis*, 81 (1990), 663 - 83.

¹⁴¹ Birch, *op. cit.*, p. lxxv.

¹⁴² *Ibid.*, p. lxxx.

¹⁴³ H. Stubbe, *An Account of the Rise and Progress of Mahometanism*, ed., H. M. Khan Shairini (Lahore, 1954).

I have argued that this act may be seen as the result of virtuous Christian charity - the consequence of his lifelong spirituality and not the promotion of a programmatic ideology. This experimental nature of Boyle's spirituality extended into all areas of his life both private and public. His personal piety was expressed in the vocabularies of Puritan and Anglican devotional treatises. His public *persona* took the form of the humanist 'uomo universale' - tolerant of other communities but fiercely defensive of primitive Christianity's emphasis on the necessity for an experimental groundedness of solid piety. On this interpretation it is significant that he established, by means of his bequest, a physical performance of the truths of Christianity and not just the financing of texts, as he had done during his life. This secure base was to protect weak and staggering Christians confronting the dogmatic systems of other faiths. The attacks on Christianity by relativising opponents served to exacerbate this situation and required scholarly and effective 'confutation'. My analysis shows that it is more instructive to deal with Boyle in terms of the richness of the available theological and devotional materials of the seventeenth century than to try to force him into a definite ecclesiastical form. Boyle was acutely aware of the burden of having to defend a particular institutional form, which he would have been obliged to do had he taken holy orders in the Anglican Church, thereby imposing limitations on his capacity to defend Christianity.

The Lectureship was instituted by Boyle to 'prove' the Christian religion as a result of his perception of the changing nature of the weapons and strategies of its enemies. The brief described how the chosen divine was to prove and defend Christianity *per se*. Its precise formulation was the result of Boyle's recognition that there existed conceptual systems which could 'stagger' the faith of a weak Christian. It was Boyle's perception that faith was constantly at risk unless 'grounded' in an experiential inner piety, enhanced through the private practice of 'right reason', and made continuously effective by means of an experimental devotion. Consequently, the function of the lectureship was to publicly assist weak Christians, those who had not experimentally grounded their faith, in regaining confidence in the singularity of the Christian dispensation.¹⁴⁴ For the most part the Lecturers followed Boyle's brief

¹⁴⁴ In practice the sermons served a variety of other functions as I show below in the chapters on Bentley, Harris and Clarke.

and at no time did the Lectureship show signs of a programme for rationalising the Christian mysteries or for the promotion of a rational theology.

The following chapters chart the subsequent management of that office. I will continue to argue that there is no necessary continuity between Boyle's perception of the task and the performances of the various divines who gave the sermons. I consider it to be an essential prerequisite to fragment the monolithic event 'Boyle Lectures' into disparate elements as this approach permits a more analytically fruitful discussion. For this reason Boyle and his pious practices have been treated, in this chapter, independently of the subsequent management of the lectureship. This move also avoids the conflation of individuals with diverse aims into ideologically coherent groups. The lecturers deployed materials and argumentative skills originating in scholarly networks which had very little in common with Boyle's own cognitive interests.

Chapter Three

The Trustees of the Boyle Lectureship.

3. 1. Introduction: A Reassessment of Boyle's Appointments.

The characterisation of the Boyle Lectureship as a 'Newtonian' venture has, hitherto, implied that the Trustees were engaged in the construction of a venue for social control underpinned by Newtonian natural philosophy. However, I will show that the Trustees' actions were not determined by a coherent group ideology but by the constraints of Boyle's bequest. I will also argue that Boyle's nominations were not guided by institutional considerations. Rather, they were the result of a complex network of personal friendships, involvement in charitable pursuits, and a widespread perception that there was an urgent need to restore a godly community to the practice of holy living.¹ Moreover, Boyle's act of appointment brought the Trustees together: the evidence suggests they had little contact prior to their function as Trustees.² Therefore, the main aim of this chapter is to provide a reassessment of the Trustees by highlighting the fragmentary and diverse nature of this group.

Two interesting factors emerge from my analysis - a highly significant dissenting presence in the Lectureship, and a clearly defined Anglican emphasis on the practice of devotion and affective piety. The dissenting presence demonstrates Boyle's desire for a simple, primitive, and unified Christianity and adds weight to the presence of Puritan elements in his pious outlook. An examination of the second factor is crucial, especially as it has become standard practice to characterise the relationship between science and religion in this period as Anglican, rational, and

¹ In this analysis Evelyn is represented as Boyle's exemplary pious Christian. The roles of the other Trustees are analysed on the basis of an individual relationship with Boyle, or, where appropriate, with each other - Evelyn and Tenison knew each other well prior to their nominations as Trustees.

² See de Bocr. v, pp. 88 - 9, where Evelyn demonstrates his obvious unfamiliarity with Ashurst and Rotherham by referring to 'Ashwood' and 'Roderith'. In the same entry he assumes that Bentley's election was to be for three years with the option to 'proceede to a new Election . . . or to continue the same, according as we shold [sic] judge'. However, Boyle stipulated a maximum of three years for any Lecturer.

Newtonian. Anglicanism has very often suffered from its portrayal as moralising and prudential. Consequently, it has been easy for historians to connect the success of natural philosophy with a purported rationalising within Anglican theological formulation. The importance attributed to Newtonianism - allied to an historiography driven by the need to establish group coherence - has diverted attention away from these two important factors regarding Boyle's decisions. This section investigates these issues in an attempt to provide a context for the discussions of the individual Trustees in subsequent sections.

The characterisation of the Boyle Lectures as 'the major vehicle' in the propagation of Newtonianism requires that the Trustees chose lecturers with the deliberate intention of publicising a mathematical system of natural philosophy, notwithstanding the fact that not one of them ever expressed such an interest. The Trustees at no time favoured the utilisation of the mathematically and mechanically ordered universe of the *Principia*. Whatever publicity Newton's views received from the performances by individual lecturers was achieved inadvertently, and was certainly not on the agenda of the Trustees.³ Evelyn alone had direct contact with natural philosophy but his interests in the natural world were vastly different from the mathematical and physical style of the *Principia*.⁴ Furthermore, he was the only member of the Royal Society, and the only Trustee who had, in terms of scientific interests, an immediate connection with Boyle.⁵ There is no evidence to suggest that Ashurst or Rotherham had any association with natural philosophy - their dealings with Boyle were of a legal and institutional nature. As the Trustees were acting on behalf of someone who had spent his life in the pious study of the natural world, we

³ Larry Stewart's work illustrates the case with which the Boyle Lecturers are represented as instrumental in the propagation of the new science. This is a consequence of conflating the Sermons with the practice of public lecturing in natural philosophy made popular around the same time as the inauguration of Boyle's bequest. See Larry Stewart, *The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660-1750* (Cambridge, 1992) p. 64. Stewart argues, 'the significance of the sermons must be acknowledged' in 'conjunction' with the 'multiplying' numbers of public lectures in science in the reign of Anne.

⁴ Evelyn's Baconianism with its emphasis on the pious and virtuous practice of 'useful' knowledge ought not to be conflated with the recognition of 'order' as a sign of a providential deity. There are very few entries on Newton in Evelyn's diaries - a passing reference (without naming him) to Newton's presentation of his reflecting telescope to the Royal Society is the only entry on Newton's scientific work. See de Beer, iii, p. 601.

⁵ Tenison, Ashurst and Rotherham were not members of the Royal Society. On the Society and its membership see, Michael Hunter *The Royal Society and its Fellows 1660 - 1700: the Morphology of an Early Scientific Institution* (2nd. ed., Oxford, 1994).

can assume that their individual conceptions of practical Christian piety and ‘utility’ were not in conflict with the benefits for a Godly community derived from natural philosophy. At the same time it must be emphasised that each Trustee’s perception was determined by varying vocabularies of piety and charity.⁶ Although Tenison - twelve years prior to his involvement with the Lectureship - published a work on Bacon, his connection with natural philosophy was not maintained during his subsequent busy ecclesiastical and parochial life.⁷ Thus apart from Evelyn the Trustees had little or no contact with natural philosophy, and *a fortiori* with Newtonianism.

Although the Lectureship was legally a benefice of the Anglican Church Boyle had specifically placed control in the hands of an ecclesiastically heterogeneous group. Of course, legally the chosen Lecturers were institutionally - if not always doctrinally - orthodox Anglicans.. Only one of the Trustees, Thomas Tenison, was ordained. Henry Ashurst and John Rotherham were dissenting laymen and their theological leanings are difficult to determine with any degree of accuracy. John Evelyn was a staunch Anglican who held fast to his Royalist sympathies and always maintained an ambiguous attitude towards the appropriation of the throne of England by an invading Monarch. In view of the diversity of the group I reject the label ‘Latitudinarian’ as a catch-all term for their general theological outlook: this term, in the particular case of the Trustees, has further obscured the reasons for Boyle’s decision to assign responsibility for his lectureship to such a heterogeneous group. Moreover, this obfuscation has prevented a properly focused analysis of his choices

⁶ The ‘utility’ of natural philosophy and its attendant rhetoric may not have been produced by a single discourse, nor from a single site, such as the Royal Society. For a discussion of the ‘rhetoric’ of the Royal Society see Paul Wood. ‘Methodology and Apologetics: Thomas Sprat’s *History of the Royal Society*’, *BJHS*, 13 (1980), 1 - 26. Peter Dear provides a more nuanced account in ‘Totius in Verba: Rhetoric and Authority in the Early Royal Society’, *Isis*, 76 (1985), 145 - 61.

⁷ Thomas Tenison, *Baconiana . . . Or certain genuine remains of Sr. Francis Bacon . . . in arguments civil and moral, natural, medical, theological, and bibliographical; now for the first time faithfully published. An account of these remains, and all of his . . . other works, is given by the publisher, in a discourse by way of introduction* (London, 1679). Tenison’s approval of the Baconian philosophy was couched in the standard vocabulary praising its usefulness. In *Baconiana* he displayed his support for the activities of the nascent Royal Society, where the Baconian ideal of appropriating scholarship - irrespective of its source or content - in the service of a truly Christian polity, appealed to Tenison. The work may have influenced Boyle’s decision to include Tenison in the list of Trustees - this does not make him a Newtonian. Besides, as I shall show in the discussion on Tenison, there are much more compelling reasons for Boyle’s nomination of him than his brief comments on experimental philosophy.

and the group's subsequent behaviour.⁸ The labels 'Anglican Latitudinarian' (or 'moderate Anglican') are also not very useful analytical categories, particularly when dealing with the complex behaviour of individuals. John Rotherham appears to have had very little connection with the Boyle family, whereas Ashurst was connected with Boyle through the activities of the New England Company.⁹ Thomas Tenison, although tolerant of Nonconformists, never departed from his main concern to establish a national consensus of Protestant ecclesiastical union within the body of the Anglican Church. Evelyn, who was closest to Boyle in attitude and interests, could be described as a pious 'Ciceronian', a Christian-humanist and Royalist, deeply engaged in a personal and philosophical re-enactment of 'holy-living', who regularly bemoaned a decline in the private and public virtue of the Court.¹⁰

Given the foregoing brief characterisation of the Trustees, Boyle's choices may be accounted for in terms of a nexus of Christian values drawing mainly on the concepts of holy-living and civic virtue - concepts which were themselves constructed from a reservoir of inherited vocabularies. These constructions were both textual and practical, private and public, and the vocabularies used to portray them transcended institutional commitment. We have already seen this in the case of Boyle, where Puritan, Anglican and Humanist vocabularies were used to construct and present a primitive Christianity grounded on personal experience. The common ground between Boyle and the Trustees may be found within this nexus which sought

⁸ On the limitations of the label 'latitudinarian' see, John Spurr, ' "Latitudinarianism" and the Restoration Church', *History Journal*, 31 (1988); William M. Spellman, *The Latitudinarians and the Church of England, 1660 - 1700* (Athens/London, 1993). Also the term 'Whig' is not necessarily synonymous with 'Latitudinarian-Newtonian' as Jacob claims. See, Anita Guerrini 'The Tory Newtonians: Gregory, Pitcairne, and Their Circle', *Journal of British Studies*, 35 (1986), 288 - 311. For a very balanced discussion on the profile of a 'Latitudinarian' see, Jeffrey S. Chamberlain, 'The Limits of Moderation in a Latitudinarian Parson: or, High-Church Zeal in a Low Churchman Discover'd' in, Roger D. Lund, ed., *The Margins of Orthodoxy: Heterodox Writing and Cultural Response, 1660 - 1750* (Cambridge, 1995), pp. 195 - 215.

⁹ On Ashurst, Boyle and the New England Company see, William Kellaway, *The New England Company 1649-1776* (London, 1961). See N. H. Keeble and Geoffrey Nuttall, eds., *Calendar of the Correspondence of Richard Baxter* (2 vols., Oxford, 1991), for an account of the letters between Ashurst and Baxter relating to the New England Company.

¹⁰ I have taken R. W. F. Kroll's discussion of Evelyn's Christian humanism as the most accurate account of his public and private piety and of his scholarly activities. See, *The Material Word: Literate Culture in the Restoration and Early Eighteenth Century* (Baltimore/London, 1991), pp. 165 - 79. The term 'Ciceronian' coheres well with Evelyn's attitudes to the tensions between the private and the public spheres. See Brian Vickers, *Public and Private Life in the Seventeenth Century: the Mackenzie-Evelyn Debate* (New York, 1986); Margo Todd, *Christian Humanism and the Puritan Social Order* (Cambridge, 1987).

to restore the practice of an experiential Christian piety, necessary in correcting the vicissitudes of sin. However, I am not claiming that the Trustees and Boyle shared a common discourse, yet there was, in the history of each individual Trustee, enough shared elements to influence Boyle's decision, and to ensure that the brief would be adhered to. The main claim of this chapter is that the investigation into Boyle's choice of Trustee needs to be relocated within a context of virtuous and charitable behaviour. His decisions were effectively a continuation, and an extension of his own practical Christian virtuous behaviour.

The Trustees' origin as a group was dependent on Boyle's decisions and their common aim rested primarily on the trust invested in them. The Lecturers, on the other hand, will in future chapters be represented as responding to the duties of office, patronage, and the demands and constraints of scholarly activities.¹¹ This process of segregation between the Trustees and the Lecturers creates further problems for the monolithic category 'Boyle's Sermons'. However, the actions of all the personnel appear to have been constrained more by Boyle's brief than the requirements of Lambeth or diocesan decisions. The availability to the Trustees of personnel capable of presenting suitable materials, depended on local contingencies and scholarly networks which in turn created personal responsibilities of patronage.¹² The importance of these individual factors has been overshadowed by a search for an ideological explanation. Tenison, after all, was the only one with specific ecclesiastical responsibilities defined by his sacerdotal office. Furthermore, these

¹¹ The concept of 'scholarship', as a constitutive component, plays an important historiographical role in the relationship between the institutional and personal arenas. It is often ignored (ironically) as a contributing factor in the day-to-day behaviour of those who positioned themselves within networks based solely on scholarly practice. This approach differs from the 'history of ideas' by its attention to the contingent factors of power, micro-networks, and the manner in which individuals selected materials to suit the occasion. See Goldgar, *Impolite Learning*, pp. 21 ff., on how the community of learning 'formed an ethic for polite society in the early modern period'.

¹² On the way power is constituted by patronage and in general on the strategies involved in patronage networks, see Mario Biagioli, *Galileo, Courtier: The Practice of Science in the Culture of Absolutism* (Chicago/London, 1993); *idem.*, 'Scientific Revolution, Social Bricolage, and Etiquette' in, Roy Porter and Mikulas Teich, eds., *The Scientific Revolution in National Context* (Cambridge, 1992), pp. 11 - 54. There is an excellent critical review of Biagioli's book by M. H. Shank in *Journal of the History of Astronomy*, 25 (1994), pp. 236 ff. I have not found a work on patronage and scholarship which deals specifically with the networks of members of the Lectureship. Related and useful works are, Simon Schaffer, 'Godley Men and Mechanical Philosophers: Souls and Spirits in Restoration Natural Philosophy', *Science in Context*, 1 (1987), 55 - 85; Steven. Shapin, 'A Scholar and a Gentleman': The Problematic Identity of the Scientific Practitioner in Early Modern England', *History of Science*, 29 (1991), 279 - 327.

networks of knowledge and duty did not always lead to harmonious relations among the Trustees as will be seen in their behaviour regarding personal preferences when choosing Lecturers. For example, Rotherham's refusal to comply in the continuation of Bentley for a second year could be construed as the proper outcome of Boyle's attempt to curb Anglican appropriation of the Lectureship: or, as the result of his individual responsibility for patronising Kidder, and his personal perception of Boyle's brief.¹³

No evidence exists which unambiguously shows why Boyle chose the Trustees. This paucity of information has motivated investigators to search for a single explanatory source for Boyle's decision. However, Boyle was not motivated by the sole criterion of using natural philosophy to support religion, and in particular Anglicanism. The corollary of this assumption asserts that the agents involved in this venture ought to cohere within an ideologically determined subset informed by theological and ecclesiastical affinity. Yet, if we take Anglicanism as a baseline for Boyle's institutional commitments - this move would only prove fruitful subject to qualification - the Trustees cannot be aligned with an Anglican political or ecclesiastical position. Tenison, Evelyn and Boyle all adhered outwardly to the same ecclesiastical institution, whereas Ashurst and Rotherham were outside, and excluded by statute, from official recognition by the established church authorities. Furthermore, Tenison, the Anglican, was not a close friend of Boyle's, whereas the dissenter Ashurst was. Evelyn was probably closest to Boyle in personal scholarly vision, yet there is no evidence at all to connect Boyle and Rotherham. I will, therefore, continue to describe these relationships in terms of, friendship, scholarship, piety, a Christian-Classical code of civic and personal worship enacted for the public good, and the humanistic conflation of these, in terms of private devotion and public virtue.¹⁴ The break-down of single ideological structures - 'moderate-Anglicanism'

¹³ Another example of the contingencies affecting the appointment of Lecturers can be seen in the case of Fleetwood who declined the offer of Lecturer due to ill health. Tenison had to remind Evelyn several times to respond to his letters suggesting an alternative candidate. See Bray, iii, 376 - 77, where Tenison suggests Bradford (eventually chosen) 'the esteemed of all . . . Him Sir Henry Ashurst knows, and will elect, if you and I will join with him'. Evelyn did not reply and Tenison had to insist in a further letter that the time was so close that the preacher would 'have no time to prepare his first sermon'. See *Ibid.*, p. 377.

¹⁴ For a detailed analysis of the term 'Puritanism' see, John Morgan, 'Puritanism and Science: A Reinterpretation', *The Historical Journal*, 22 (1979), 535 - 60.

or 'Latitudinarianism' - into these components will add some much needed detail. It will also redirect the discussion to focus on the language used by the actors themselves. In the case of Evelyn and Tenison this is fairly straightforward. Given the range of appropriate activities in which they were involved and the accessibility of their published scholarly materials this vocabulary is highly applicable. I will also show that these categories explain not only the choice of Evelyn and Tenison but also serve to explain the choice of Rotherham and Ashurst. These categories operated throughout Boyle's life in directing his own Christian behaviour and are instrumental in an explanation of his charitable endowments (the Lectureship was only one of his many charitable bequests).

If we adhere to the Jacob thesis which portrays Boyle as party to a Whig-Latitudinarian interest, then the choice of Evelyn, the faithful Royalist and Tory, becomes problematic. Moreover, how are we to explain the relationship between Tenison, who trenchantly supported William and Mary and the Revolutionary-Settlement, and Evelyn who never wholeheartedly gave his assent to settlement principles? Yet, in spite of their different political allegiances, the correspondence between Tenison and Evelyn was highly amicable and displays a shared interest in scholarly, ecclesiastical, and patronage responsibilities. There is also the question why Boyle chose two members of prominent dissenting families in London who had little or no connection with Evelyn and Tenison prior to Boyle nominating them. Therefore, it was only Boyle's charitable act and the demands of the legal office incumbent on the group which united them.

The following sections provide brief biographical accounts of the Trustees. This focus on the individual Trustee illustrates the importance of individual agency within an institutional setting. For this reason I introduce the Trustees in the context of their 'day-to day' activities and the contingencies encountered in performing their various duties: these activities coalesced in the office of Trustee but this duty was only one among many.¹⁵ It is also important to locate this quotidian behaviour of the Trustees within the context of the changing nature of the attacks on Christianity. The situation obtaining in 1692 when Bentley was chosen to present the first series of

¹⁵ A glance through the *CSPD* for this period will show the enormous range of civic duties and titles held by Ashurst and Rotherham.

sermons should not be conflated with that which determined the choice of William Derham twenty years later. By that time Tenison was the only remaining Trustee and the Lectureship had become solely his responsibility. Therefore we should not treat the Lectureship as a static substantive determining the behaviour of its personnel: a much richer picture emerges when it is seen as a consequence of the contingencies of duty, scholarship, and patronage.

3. 2. Thomas Tenison (1636 - 1715).

Tenison's function as Trustee, in comparison with his other priestly and ecclesiastical offices, was a relatively minor task. Yet, in the light of his own scholarly activities, it was an important one. He had previously published attacks on materialism, atheism and idolatry, but the bulk of his writings was devoted to a sustained campaign against the Roman Catholic Church.¹⁶ He was firmly convinced of the need for a scholarly and learned clergy and was an enthusiastic and life-long bibliophile. This conviction affected his choice of candidates for the Boyle Lectureship. Thus an established, or developing, reputation within the scholarly community of any proposed candidate was a major factor in the choices of both Tenison and Evelyn. The concern with the state of learning among the orthodox is reflected in the numerous charitable acts to establish libraries, and the ubiquitous activity of appropriating the collections of the deceased carried on by individuals who often financed the purchases personally. Tenison was responsible for building the first public library in London. The cost, according to Carpenter, '[was] borne entirely by Tenison, who left a settlement for the support of the fabric and the salary of the librarian'.¹⁷ Tenison's interest in establishing parochial libraries was part of his more widespread concern with education - both of the clergy and the laity.¹⁸

By the time of Boyle's death (30 December 1691) Tenison had already been

¹⁶ Edward Carpenter, *Thomas Tenison Archbishop of Canterbury His Life and Times* (London, 1948). Relevant publications include, *The Creed of Mr. Hobbes Examined* (London, 1670); *Of Idolatry: A Discourse in which is endeavoured a Declamation of, its Distinctions from Superstition; its Notions, Cause, Commencement, and Progress* (London, 1678); and *A Sermon Concerning the Folly of Atheism* (London, 1691).

¹⁷ Carpenter, *op. cit.*, pp. 24-5.

¹⁸ For a brief account of the move to establish libraries in this period see, Raymond Irwin, *The Origins of the English Library* (London, 1958), esp. pp. 191 ff. Evelyn remarks on Tenison's new parish library in de Beer, v, p. 367 (Feb. 13 1684). Tenison requested the help of Evelyn and Wren in setting it up.

translated to the see of Lincoln on the direct suggestion of Queen Mary.¹⁹ White Kennett writes that he had been ‘recommended to their Majesties by his Exemplary Piety, and his great Moderation towards Dissenters’.²⁰ He was elected on 11 December, 1691, and consecrated at Lambeth, 19 January 1692, by Archbishop Tillotson, assisted by the Bishops of London. Thus Tenison was not yet a bishop when Boyle nominated him as a Trustee. However, Boyle may have been influenced by Tenison’s situation in the London see, especially as the chosen divines were to be within the ‘Bills of Mortality’.²¹ Furthermore, since 1680, Tenison had been the incumbent of the prestigious city living of St. Martin-in-the-Fields (on the doorstep of Boyle’s house in Pall Mall) and was also minister of St. James’s Piccadilly between the years 1686 and 1692. Although his election took place in December 1691, he retained these livings for financial reasons and managed to secure a grant which allowed him to hold them until the following July. As Carpenter says, ‘setting up in a bishopric was always a costly business’.²²

Tenison had come to scholarly prominence whilst occupying these prestigious London livings, and acquired fame *via* his various controversies with the Jesuit theologians. His strong anti-Catholicism and trenchant support for the Anglican Church inclined him to make overtures to moderate dissenters which drew opprobrium from high-church colleagues who charged him with extreme Erastianism. His early support for the Anglican Church can be seen from the fact of his private ordination by Bishop Duppa just prior to the Restoration in 1660, during the period

¹⁹ *CSPD*. Carpenter *op. cit.*, pp. 121 - 2.

²⁰ Carpenter, *op. cit.*, p. 121. Carpenter is quoting from White Kennett’s *A Complete History of England . . . from the Earliest account of Time, to the Death of His Late Majesty King William III* (3 vols., London, 1706), iii, p. 34.

²¹ In 1563 systematic inventories of parish births and deaths were published in England. In London these bills of mortality were carried out for 97 parishes within the walls, 16 outside the walls and a number in Middlesex and Surry. The survey also included 7 parishes in Westminster. See Dham ‘Science and Religion’ p. 10, who derives the information from A. Wolf, *A History of Science, Technology and Philosophy in the 16th. and 17th. Centuries* (2nd. ed., 2 vols., London, 1950), esp. pp. 587 - 608. Wolf provides a valuable discussion of John Graunt’s, *Natural and Political Observations mentioned in a following Index, and made upon the Bills of Mortality* (London, 1662). The importance of Graunt’s work can be gauged from the fact that it was in its fifth edition by 1676..

²² *Op. cit.*, p. 122. Interestingly the reason for the vacancy of the see of Lincoln was the death of Thomas Barlow, the divine who had written the cases of conscience work at Boyle’s request. Unlike Tenison who was both scholarly and highly enthusiastic over his parochial responsibilities Barlow, who died 8 October 1691, was ‘a diocesan who in life was as much distinguished for his scholarship as for his total neglect of the diocese’. Carpenter, *op. cit.*, p. 121.

when Episcopal ordination was proscribed.²³ It must also be stressed that, although later in his career Tenison inclined to a church subject to powerful state control, he never departed from his allegiance to orthodox doctrinal formulations.²⁴

In line with most ambitious young clergymen Tenison sought and gained patronage. He had been tutor at Corpus Christi College to Edward Montague the fifth son of the Earl of Manchester, and at the Restoration was made chaplain to the Montague household.²⁵ Tenison's first published work, *The Creed of Mr. Hobbes Examin'd* was dedicated to the Earl and in it can be seen his perception of the seductiveness of Hobbes's style and the threat it posed to weaker Christians. This is very revealing as it illuminates the fears of the orthodox regarding the persuasiveness of the style and not just the content of suspect texts. In a listing of Hobbes's 'sins' Tenison outlines as sin number seven the danger of seductive language. According to Tenison, Hobbes had published

Errours in Theologic in the English Tongue, insinuating himself, by the handsomeness of his style, into the minds of such whose Fancie leadeth their Judgements; and, to say truth of the Enemy, he may, with some Reason, pretend to *Mastery*, in that language. Yet for this handsomeness in dressing his Opinions, as the matter stands, he is to be reprov'd; because by that means, the poyson which he hath intermixed with them is, with more readiness and danger swallowed.²⁶

²³ Spurr cites an impressive list of Anglican worthies who had sought covert Episcopal ordination (even though it was unnecessary and proscribed by law) during the Interregnum - Dolben, Tenison, Tillotson, Stillingfleet, Cartwright, Bull, Barrow, Kidder, Patrick, Cumberland, South, Clement Ellis, William Lloyd, and John Scott.

²⁴ During the reign of Anne he lost favour whilst his more high-church counterpart at York, Archbishop Sharp, gained the ear of the anti-Whig queen. In fact, Tenison had violent disagreements with Anne over what he felt was an incursion into ecclesiastical affairs. See, Geoffrey Holmes, *British Politics in the Age of Anne* (Revised ed., London/Ronceverte, 1987), esp. pp. 28 ff., on the personal animosity between Whig and Tory divines and how it was not detrimental to the institutional security of the Anglican church. Holmes makes the point that the Arian controversy actually united divines of both political persuasion.

²⁵ Tenison graduated B. A. in Lent term 1657 from Corpus Christie and first studied 'physick'. As his ordination took place in 1659 he must have opted for a clerical life and a short career in medicine. According to the *DNB* article he took the M. A. degree in 1660, B. D. in 1667, and made D. D. in 1680. In 1662 he became university tutor and was university reader in 1665. On the chequered life of his patron, see *DNB* q.v., 'Manchester' Manchester was generally of Puritan sympathies but retired into private life when the establishment of the Commonwealth became an inevitability. He was restored to favour after the Restoration.

²⁶ 'Dedication', A4. Another interesting 'sin' of Hobbes was the affront he had caused to geometry, which, Tenison claimed 'so well deserveth the name of Science'. Tenison shrewdly conflated Hobbes' attacks on religion and his disagreements with the mathematicians when he described him as, 'the same person, who endeavoureth to shake the Foundations of Religion, doth manage a quarrel against the very Elements of *Euclid*'.

Tenison was simply reflecting the widespread fear that the attractive and fashionable style associated with the Court wits would seduce unwitting believers by the power of their rhetoric and the 'ingenuity' of their tactics.²⁷

In this early work Tenison also provided a succinct account of a rhetorical defence of Christianity, which bears directly on the main purpose of the Lectureship. Speaking of a major stylistic fault in sacred orators he singled-out the rhetorician Albutius. According to Tenison, Albutius tried to say everything, but failed to say anything effectively. The rhetorician, or sacred orator, should therefore say only what is fitting on any subject:

a Defender of Religion is not always bound to produce the Arguments which prove the Truth, of which the Church is always supposed to be in possession; but it sufficeth that he keep off Aggressors: And this (for instance) was the manner of Lactantius.²⁸

Furthermore, like Boyle, he never lost the awareness that those Christians who were unprepared conspired with the irreligious. Tenison therefore emphasised protection and not formal proof. In 1689, in his sermon 'against Self-Love', he described the dangers of this weakness and castigated those who were driven to a 'pretence' of irreligion simply from being unable to withstand the force of their opponent's mockery:

Two great Evils have reigned among us, by which Almighty God has been moved to heavy Displeasures: The denial of his Existence by *Atheists*, and the forbearance of a Profession of Piety, by *weak Believers*, who have not had enough Christian Courage to bear the Shock of their insolent Mockeries: insomuch that the very *Form* and *Face* of true Religion has, sometimes, disappeared; and the worst kind of Hypocrasie has come upon the Stage, the dissembling of Iniquity, and the owning of Vices which have not been committed.²⁹

²⁷ See J. H. Wilson., *The Court Wits* (Princeton, 1948). Boyle drew attention to the same dangers in *Seraphic Love*. See Lawrence M. Principe, 'Style and Thought of the Early Boyle: Discovery of the 1648 Manuscript of *Seraphic Love*', in *Isis*, 85 (1994) 247-60. It is also significant that Hobbes was a great favourite of the Catholicising Charles II. Thus, confirming for Anglicans the close strategic connection between Roman Catholicism and Atheism. See, Samuel I. Mintz, *The Hunting of Leviathan: Seventeenth-Century Reactions to the Materialism and Moral Philosophy of Thomas Hobbes* (Cambridge, 1962), p. 14.

²⁸ Tenison. *op. cit.*, A5.

²⁹ *A Sermon against Self-Love, etc. Preached before the Honourable House of Commons, 5 June, 1689. Being the Fast-Day, Appointed to implore the Blessing of Almighty God ... declared against the French King.* On 'wit' and 'ridicule', see John Redwood, *Reason, Ridicule and Religion: The Age of Enlightenment in England, 1660 - 1750* (Cambridge, 1976). Richard Baxter considered the issue of weak Christians so important that he wrote a complete work on the problem - *Directions for Weak Dispermed Christians to grow up to a Confirmed State of Grace . . .* (London, 1669).

This bears a marked similarity to the fears expressed by Boyle over the behaviour of weak and staggering Christians. Boyle's response was to ground his piety in both an experiential examination of his own conscience, by reason and experiment, and to finance the propagation of Christianity. Tenison expressed his concerns in a similar way but, given the nature of his sacerdotal and parochial functions, he saw the solution in the more public programme of education and scholarly charity. The perceived problem was identical - the unpreparedness of Christians in the face of learned, ingenious, and witty attacks by the irreligious or the infidel. The solutions stemmed from the recognition of the need for a practical response. I suggest that the existence of the Lectureship is also the result of, and a solution to this perceived threat.³⁰

Prior to his elevation to the See of Lincoln Tenison had followed Stillingfleet into the Archdeaconry of London, the latter having been promoted to the See of Worcester.³¹ Tenison was one of ten clergymen passed by Gilbert Burnet to William for preferment in the wake of the Revolution. This new position gave Tenison jurisdiction over most of the parishes in London, involving a host of duties, along with the authority to prove 'the wills and grants letters of administration of intestate goods of such as die within the said Parishes'.³² Tenison, therefore, had two years' experience dealing with probate by the time of Boyle's death.

However, as I have already suggested the main factor which induced Boyle to choose Tenison as one of the Trustees was probably his involvement in various schemes to found schools, libraries, and charities alongside his undoubted scholarly credentials. His choice of Ashurst adds considerable weight to this claim since Ashurst was the son of one of the controlling members of the New England Company

³⁰ Spurr argues that 'the clergy's rhetoric was designed less to convince their enemies than to edify their own congregations by presenting them with the reverse image of true religion', *op. cit.* p. 236

³¹ Carpenter, *op. cit.*, p. 120. On Stillingfleet see R. T Carroll, *The Common-Sense Philosophy of Religion of Bishop Edward Stillingfleet, 1635-1699* (The Hague, 1975).

³² *Op. cit.*, p. 120. Carpenter is quoting from R. Newcourt's *Repertorium Ecclesiasticum Parochiale Londoniense* (1708 - 10). Probate was generally under the auspices of the Church and the clergy acted as advisers with regard to the settling of debts and the ordering of affairs relating to endowments and bequests. The Rubric in the Order for the Visitation of the Sick in the *Book of Common Prayer*, instructs the minister to 'admonish' the sick person to 'make his Will, and to declare his Debts, what he oweth, and what is owing unto him; for the better discharging of his conscience, and the quietness of his Executors'. See John Addy, *Death, Money and the vultures; Inheritances and Avarice, 1660 - 1750* (London, 1992).

which was a major propagation force from the mid-century and under the governance of Boyle from 1662 - 1689. Tenison funded charitable and pious schemes from his own pocket as he would later do for the Boyle Lectureship when the bequest proved insufficient.³³ This act, and similar ventures performed by Tenison, Evelyn, and the Ashurst family, constituted a nexus of 'holy living' which cannot be gratuitously dismissed - or reduced to - the notion of 'utility' or social engineering. It is unfortunate that the concept of 'utility' has been secularised beyond its links with piety.³⁴ It should be noted that Tenison retained a strong personal involvement in the ecclesiastical management of his various parishes, paying particular attention to the scholarly status of prospective candidates for the priesthood.³⁵

Tenison's personal learning and interest in scholarship also demand attention. Evelyn first heard him preach in 1680 and three years later he described him as 'one of the most profitable preachers in the church of England, being also of a most holy conversation, very learned and ingenious'.³⁶ Since Evelyn was a highly astute critic of sermons his assessment is valuable, especially given the different political tenor of the two men and Evelyn's emphasis on personal piety and learning. Furthermore, as Norman Sykes has shown, the London churches were a testing ground for ambitious prelates to promote their oratorical and theological skills.³⁷

³³ See the dedication to Derham's *Physico-Theology* (Boyle Lectures for 1711 and 1712), where he recounts how Tenison financed the Lectureship when the rents owing from the properties which normally paid the Lecturers were not forthcoming. Letsome and Nicholl, *op. cit.* iii, mispaginated.

³⁴ See Charles Webster, *The Great Instauration: Science, Medicine, and Reform 1626 - 1660* (London, 1975). This monumental study has a tendency to secularise the concept of 'utility' and remove it from the practice of Christian piety and charity to relocate it in programmes of social reform reminiscent of the 'welfare state'. The 'Puritan Ethic' thereby becomes a social *response* to the pressures of certain doctrines (predestination, for e.g.) rather than the outward *expression* of a demand for a practical demonstration of piety and charity which ran right across the ecclesiastical spectrum. Christopher Hill provides the classic account of this 'Weberian' approach in his *Change and Continuity in Seventeenth-Century England* (London, 1974), esp. pp. 81 - 102. For critiques of this approach see, Margo Todd *op. cit.*; John Morgan *Godley Learning: Puritan Attitudes towards Reason, Learning, and Education, 1560 - 1740* (Cambridge, 1986); John Spurr's various writings have consistently argued for the ubiquity of 'practical' divinity and an Anglican ethos of piety and virtue.

³⁵ Carpenter. *op. cit.*, pp. 147 ff.

³⁶ *DNB*, q.v., "Tenison".

³⁷ Norman Sykes, *Church and State in England in the XVIII Century* (Cambridge, 1934) p. 254. Sykes cites the example of Archbishop Sharpe who took the Friday lecture at St. Lawrence Jewry, where according to Sharpe's biographer, 'there was not so much a concourse of people as a convention of divines, especially those of the city who had customarily attended those lectures from

Tenison was a prominent churchman at the time of Boyle's death: his position in the London clerical community and the high opinion of Evelyn and Burnet may have persuaded Boyle to include him among the Trustees. Boyle could not have been unfamiliar with Tenison's growing reputation since he held the living of St. Martin's-in-the-Fields - the London parish very close to Lady Ranelagh's (Boyle's sister) house in Pall Mall. Furthermore, Lady Ranelagh had been keeping open-house for gatherings of divines and virtuosi since the 1640s and 50s. Allied to this personal network was the wide range of interests and duties carried on by Tenison which would have struck a sympathetic note in Boyle's own perception of the genuine Christian life. The choice of Tenison over other clergymen with whom Boyle did have personal contact is certainly not to be explained as the result of Tenison's Latitudinarian natural religion. Boyle's own critique of current natural theology and his perception of the limits of reason in salvation would have excluded a proponent of the 'sufficiency of reason' in matters theological.

3. 3. John Evelyn (1620 - 1706).

Evelyn was the embodiment of what the Lectureship represented and for Boyle's purposes, the exemplary pious Christian.³⁸ The aim of this section is to locate Evelyn within an ethos of practical piety and charity and to suggest that these were the criteria which influenced Boyle in his decision to appoint him as Trustee.³⁹

the time of Dr. Tillotson'. Thomas Sharp, *Life of J. S. . . to which are added, select original and copies of original papers* (1825), i, p. 30 - 1. These comments are interesting in that they offer some evidence that the audience was a learned one, and that divines were drawn to listen because of the oratorical spectacle provided by competent preachers. Birch in his *Life of Tillotson*, made similar comments on Tillotson's Tuesday Sermons at St. Lawrence Jewry which were attended by a 'great concourse of the clergy, who came thither to form their minds'.

³⁸ There is only space in this work to offer thematic samplings of Evelyn's activities and this rather sketchy account should not be considered to represent adequately the full range of his private and public activities. For biographical information see, W. G. Hiscock *John Evelyn and his Family Circle* (London, 1955); Geoffrey Keynes, *John Evelyn, A Study in Bibliophily. A Bibliography of his Writings* (Oxford, 1968). Both the *DNB* and *DSB* articles are useful. Also, for comments on the concept of 'piety', see the annotated edition of Evelyn's *Memoirs*, by H. Maynard Smith, 'The Early Life and Education of John Evelyn', in *Oxford Historical and Literary Studies*, xi, (Oxford, 1920).

³⁹The Victorian image of the saintly and pious Evelyn came under attack from Virginia Woolf in *Rambling round Evelyn*, where she 'read between the lines' of Evelyn's *Diary*. Hiscock pursues this iconoclastic project in his *John Evelyn and Mrs. Godolphin* (1951) in order to 'provide a necessary and illuminating corrective to the Victorian eulogy of the Diarist'. The relationship between Evelyn and Mrs. Godolphin, for Hiscock, is established by means of little more than punning on terms such as pious 'ejaculations'. Hiscock also misinterprets the classical and Christian vocabularies of friendship, piety, virtue etc. and is constantly quoting out of context in order to construct a narrative in which Evelyn exploits the innocent and susceptible Margaret Godolphin.

Boyle and Evelyn were close friends for over thirty years. They probably first met in April 1656 at Sayes Court (Evelyn's home) where Boyle dined with Evelyn, in the company of George Berkeley, Jeremy Taylor and John Wilkins.⁴⁰ Their friendship continued until Boyle's death in 1691.⁴¹ In 1659 Evelyn sent Boyle a long letter containing a proposal for an academy that would prove conducive to

the most blessed life that virtuous persons could wish to aspire to in this miserable and uncertain pilgrimage, whether considered as to the present revolutions, or what may happen for the future in all human probability.⁴²

He hoped to persuade Boyle to finance and lead this proposal for a monastic scholarly community in which 'especially shall be recommended the promotion of experimental knowledge, as the principal end of the institution'.⁴³ According to Evelyn the retreat would have echoed ancient anchorite projects undertaken by those who had the misfortune to live during political confusion.⁴⁴ Evelyn's hopes were not fulfilled and Boyle's response, if he actually made one, has not been located. However, he eventually became one of the founding signatories of the Royal Society.⁴⁵ Evelyn was not to see his religiously-inspired project fulfilled in the Royal Society due to rising factionalism. In the third edition of his *Sylva* Evelyn was, as Michael Hunter says, 'inspired to an impassioned plea' for support for the Society.⁴⁶

⁴⁰ Maddison, *Life*, p. 90.

⁴¹ L. T. More, in his *Life and Works of the Honourable Robert Boyle* (Oxford, 1944), p. x, informs us that Evelyn was appointed by Boyle as one of his literary trustees, and that he also provided Burnet with material for a biography of Boyle. The task of biographer went to William Wotton on the recommendation of Evelyn. However, Wotton never completed the projected biography. For a discussion of this projected biography see, Michael Hunter, *Robert Boyle by Himself and his Friends*. (London, 1994), pp. xxxvi - liv.

⁴² Bray, vol. iii, p. 117.

⁴³ *Ibid.* p. 119

⁴⁴ *Ibid.* p. 120. Evelyn compared the contemporary situation in England with the disruption of the Roman Empire by the Goths. 'when Saint Hierome [Jerome], Eustochius, and others, retired from the impertinences of the world to the sweet recesses and societies of the East'.

⁴⁵ Dorothy Stimson, *Scientists and Amateurs: A History of the Royal Society* (London, 1949), esp. p. 51. It is also accepted by many scholars that Evelyn gave the Society its title. Evelyn, in the epistle dedicatory to his translation of Naudé's work on organising a library, referred to this assembly as the 'Royal Society.' Evelyn was nominated to the Society's council by the king in the charter granted 5 July 1662.

⁴⁶ *The Royal Society and its Fellows 1660-1700: the Morphology of an Early Scientific Institution*, p. 41. *Sylva, or a Discourse of Forest-Trees and the Propagation of Timber* (3rd. ed., London, 1679). It is noteworthy that in the third edition the arms of the Royal Society are no longer used on the title page. See, Keynes, *op. cit.*, p. 136. See Hunter, *Science and Society*, pp. 83 - 4, for Evelyn's complaints about the apathy prevalent in the Society.

The project suggested in the letter to Boyle was typical of the programme of contemporaries such as Sir Thomas Browne, Abraham Cowley and John Beale.⁴⁷ For this reason, Graham Parry locates Evelyn in the 'Paradise regained' programme of these contemporaries, and describes how

[i]n the politically unrewarding years of the late 1650s, when royalist gentlemen like Evelyn were excluded from public life and had to make the most of private initiatives, he became increasingly favourable to the scheme for a college for natural philosophy.⁴⁸

Parry also argues convincingly that the ubiquity of notions of 'revival', 'renewal', 'restitution', 'restoration' or 'instauration' must be positioned within this atmosphere of anticipation. It is in this sense that Evelyn's Baconian assertion that time must be redeemed should be understood. The particular kind of redemption now required was of 'productive, beneficial knowledge, and what better knowledge than that of gardening?'

Evelyn combined this project of Christian restoration with humanist and classical motifs. This Christian humanism permeated his writings, his practice of the horticultural 'sciences', his interest in statuary and numismatics, and also his historical and antiquarian scholarship.⁴⁹ The harmonious reconciliation of civic duty and contemplative piety in Evelyn's overall programme is very often ignored. Evelyn's literary and scientific practices demonstrate how intense piety and devotion to the Anglican church were not compromised by his perception of the public benefits

⁴⁷ Graham Parry, 'John Evelyn as Hortulan Saint', in Michael Leslie and Timothy Raylor, eds., *Culture and Cultivation in Early Modern England: Writing and the Land* (Leicester/London, 1992), pp. 130- 150. Webster's *Great Instauration* has become the *locus classicus* for the study of this widespread programme of restoration. For a more detailed account of Evelyn's 'scientific' projects and the Royal Society see Margaret Denny, 'The Early Program of the Royal Society and John Evelyn', *Modern Language Quarterly*, 1, (1940), pp. 481 - 97.

⁴⁸ Parry, *op. cit.*, p. 132.

⁴⁹ The range of Evelyn's purely scholarly activities (apart from his practical horticultural projects) included antiquities, ancient histories, bibliophily, philology and language reform. These activities almost exactly paralleled the humanist projects of the Parisian erudite who attempted a blending of philosophical history and the collecting of ancient artefacts. Levine points out that although the Royal Society was 'pledged to natural science' it had concerned itself with this kind of scholarship on various occasions and published it in the *Philosophical Transactions*. For an account of these publications see Joseph M. Levine, *The Battle of the Books*, pp. 384 ff. For a general discussion of the antiquarians see Graham Parry, *The Trophies of Time: English Antiquarians of the Seventeenth Century* (Cambridge, 1995). For a study which focuses entirely on the concept of 'origins' and 'restoration' see, Alvin Snider, *Origin and Authority in Seventeenth-Century England: Bacon, Milton, and Butler* (Toronto/Buffalo/London, 1994). Lynn Sumida Joy provides an excellent account of the Parisian erudite in *Gassendi the Atomist; Advocate of History in an Age of Science* (Cambridge, 1987).

derived from experimental philosophy. Furthermore, his attempts to express the true Ciceronian life, - maintaining a balance between the public requirements of a *vita activa* and philosophical retirement - were not in contradiction with a strong Protestant sense of individual sin and the need for salvation.⁵⁰ Thus contemporary awareness of the original corruption of human nature and its natural inclination to sin is a crucial factor in any attempt to understand the practices of Boyle and Evelyn.

Considering the complex texture of Evelyn's pious and civic practices, Margaret Jacob's description of him as a 'weathervane of Latitudinarian thinking' is not very revealing. According to Jacob

Boyle's influence among the latitudinarians was institutionalised after his death in 1691 in the Boyle Lectures ... These lectures were controlled by the latitudinarians and in particular by Thomas Tenison . . . and John Evelyn, close friend of Boyle.⁵¹

For Jacob, Evelyn represents one of the 'intellectual leaders and patrons' of a group which she refers to as the 'young Newtonians'.⁵² This description ignores Evelyn's practices, both material and stylistic. By shifting the focus onto Evelyn's practices it is possible to provide a more fine-tuned picture. If we concentrate on the language of Christian piety (with its acute awareness of sin and the need for reformation) we see his scholarly context defined by classical humanist features, yet immersed in Anglican affective piety. This vocabulary is composed of the following elements: public interest; civic and personal virtue; friendship; erudition; pious experience; and a discourse of 'schemes', which advocated communal sites for the propagation of

⁵⁰ On the relationship between the active and the public life see, Brian Vickers, *Public and Private Life in the Seventeenth Century: the Mackenzie-Evelyn Debate* (New York, 1986). Vickers argues that Evelyn's defence of the active life, against Mackenzie's panegyric of the contemplative, should not be taken at face-value. It was most likely a product of a debating style which taught students to argue *pro* and *contra* any issue - the scholastic technique of debating *utrumque partem*. It is generally accepted that his defence was rather half-hearted. Evelyn's attitude to this particular literary performance can be seen in his remarks to John Beale where he characterised public life as, 'secular affairs ... the Burial of all Philosophical Speculation & Improvements'. See, Michael Hunter, *Science and Society in Restoration England* (Cambridge, 1981), p. 134.

⁵¹ *NER*, pp. 32 - 3.

⁵² *Ibid.* p. 141. It is crucial for Jacob's argument that the name of Newton be tied to the Lectureship. The case for Evelyn as one of Bentley's 'patrons' is based on Jacob's confusion between Bentley the publisher and Bentley the Boyle Lecturer (I would like to thank Mordechai Feingold for drawing my attention to this). Other scholars continue the historiographical myth of this early relationship between the personnel of the Lectureship. For example, see Levine. *The Battle of the Books: History and Literature in the Augustan Age* (Ithaca/London, 1991), pp. 47, and 51 - 2, where the author argues that Bentley was chosen on the recommendation of Evelyn, because Bentley supervised Evelyn's work through the press - several years after Bentley's Boyle Sermons!

true Christian scholarship, in opposition to the decaying and moribund learning of the universities and the mere sceptical wit and false ingenuity of the Court literati.⁵³

Due to his Royalist leanings Evelyn left England in 1643 and commenced his tour of European centres of learning. In 1646 he entered the group of English émigrés in Paris who worshipped at the Anglican church organised by Sir Robert Brown (Evelyn eventually married Brown's daughter). There Evelyn met the coterie of erudite humanist scholars surrounding Peiresc and Gabrielle Naudé - of which Gassendi, Mersenne and Descartes were also members - through which he encountered the classical alternatives to Aristotelianism in the form of Gassendi's Epicurean project.⁵⁴ Robert Kargon has argued how Evelyn was a major protagonist in the transmission of corpuscularian ideas, suitably Christianised, into the practice of experimental philosophy.⁵⁵ However, it would be more accurate to describe Evelyn's translation of the first book of Lucretius's *De rerum natura* as part of the scheme to introduce this Parisian Humanism into England.⁵⁶ In Kroll's terms, by translating Lucretius Evelyn was on the way to becoming 'a palpable example of that confluence of private and public virtue for which he became famous'. His literary productions, along with his practical involvement in the Royal Society, can be seen as an extension of that Parisian Humanism imported into an Anglican landed-gentry ethos.⁵⁷

It is this confluence of classical-humanist, erudite, and pious public projector, which enables us to make historical sense of Evelyn. He was the enlightened

⁵³ For a discussion of Evelyn's humanist programme see, Kroll, *The Material Word*, esp. pp. 165 - 79. Evelyn used Pagan learning to support most of his projects as a brief glance at any of his publications will show. For example, in 'To the Reader' prefaced to *Sylva*, Evelyn remarks on the propriety of drawing examples from classical authorities. Even vegetarianism was traced back to a golden age, recorded in the heathen poets, the Platonic and Pythagorean teachings, the ancient Egyptians and Indian Brahmins, as well as the Christian Scriptures. Evelyn believed that prior to the Noachian Flood human beings lived on a diet of herbs and vegetables. In this attempt to characterise Evelyn - Baconian, Humanist, pious Anglican and Royalist - we witness both the fluidity of categories and the danger of rigid taxonomies. See Evelyn to Pepys 12 August 1689, Bray, iii, pp. 294 - 311, for the extent of his literary knowledge.

⁵⁴ On this see Joy, *op. cit.*, pp. 70 and 250, fn 19; Kroll, *op. cit.*, p. 156. For an account of the Paris circle and for a brief discussion of Evelyn's 'Lucretius' see, Robert Kargon, *Atomism in England from Harriot to Newton* (Oxford, 1966), pp. 89 ff.. Kargon concentrates on atomism as a contribution to natural philosophy and is not particularly concerned with Evelyn's Humanism.

⁵⁵ Kargon, *op. cit.*, pp. 91-2.

⁵⁶ *Essay on the First Book of T. Lucretius Carus De Rerum Natura* (1656).

⁵⁷ Evelyn seems to have been in pursuit of the contemporary equivalent of Epicurus's philosophic garden. See his letter to Boyle, 3 September 1659, in *Works*, vi, p. 288,.

'amateur', endlessly juggling his private and public conscience, at the mercy of the winds of Court change and favour.⁵⁸ Perhaps it is this latter point which informs Jacob's epithet of 'Latitudinarian weathervane'? Jacob considers Evelyn as subject to a 'self-interest' which rendered him a 'supporter of the Revolution settlement', in spite of his aristocratic and Tory position.⁵⁹ In order to throw further light on my refusal to classify Evelyn as a Latitudinarian I will offer a more detailed discussion of Evelyn's self-perception in terms of his literary style and his cultivation of both domestic and public self-images. This project was construed not only in material terms but stylistically in his literary works.⁶⁰ From his early 'Animadversiones' appended to his translation of Lucretius in 1656 to the publication of his *Numismata* in 1697; in his diaries and letters; in his projects for scholarly retreats and communal sites for learning outside the university network; in his 'isolation' in Ciceronian country-retreat from the furore of public political life in the capital, Evelyn continued to enact his self-perception of the pious erudite.

Evelyn (and Boyle) were not untypical. Beale, Petty, Oldenburg, Wilkins, and a host of Christian virtuosi all desired a public forum for the practice and exchange of useful knowledge which would prove beneficial to the Godly community. It was common cultural coinage that 'true religion' was not reducible to mere intellectual endeavour. It was also accepted that although investigation into the secular and natural world could not bring about a reformation of the individual sinner, without the operation of effectual grace, it was incumbent on any Christian to

⁵⁸ Evelyn was a trenchant critic of the culture of the Court as expressed in Restoration comedies and in particular the works of the Earl of Rochester. Whilst he had strong Court connections both official and personal he had, as Hunter says, 'nothing but scorn' for what he ridiculed as 'those magnificent Fops, whose Talents reach but to adjusting their *Peruques*, courting a *Miss*, or at the farthest writing a smutty, or scurrilous *Libel* (which they would have pass for *genuine Wit*)'. See Michael Hunter, *Science and Society*, p. 166.

⁵⁹ *NER*, p. 123. Evelyn never fully supported the Revolution as can be seen from his diary entries relating to this period and the correspondence between him and Pepys regarding the latter's arrest in 1690. See J. R. Tanner, *Private Correspondence and Miscellaneous Papers of Samuel Pepys* (2 vols., London, 1926) i, pp. 29 ff. Jacob continues her characterisation of Evelyn, *vis-à-vis* Trustee of the Boyle Lectureship, as 'one of the most important guardians of church thinking and a promoter of natural religion based upon Newtonian principles'. The idea that Evelyn promoted a form of 'natural religion' is so outrageous that it defies criticism.

⁶⁰ In the following discussion I have made use of Evelyn's *Public Employment and an Active Life Prefer'd to Solitude* (and Vickers' very helpful Introduction); letters between Evelyn and Taylor, in Bray, iii, pp. 72, 78, 109, 112. Evelyn's *Numismata* (1697) and his *Lucretius* (1656), Keynes' *A Study in Bibliophily* is an invaluable commentary on Evelyn's publications and projects. Full titles for Evelyn's works are given below in the bibliography

manifest the virtues of charity, holiness and an interest in the communal welfare. It was only the vocabularies used to express this in literary form which varied from individual to individual. The Boyle Lectureship, as envisaged by Boyle, was to be an extension of this pious literary practice - knowledge produced by the scholarly godly-community, for the benefit of public virtue. Therefore, the bequest needs to be relocated within the context of an active Christian programme and the relationship between Boyle and Evelyn can be defined unproblematically in terms of the elements they shared of this common perception.

So far I have argued that Evelyn's pious ventures - public and private - formed part of a network of spiritual and material practices.⁶¹ These ventures may be further illustrated by means of a group of allied acts (textual and material) which had a dramatic location within common classical scenes.⁶² Richard Kroll provides a useful discussion of Evelyn's behaviour within this classical matrix by focusing on Cicero's *Tusculan Disputations* as an exemplary text for certain Restoration scholars. The *Tusculan Disputations*, Kroll maintains, 'symbolised a studied perspective on the turbulence of public life in Rome'.⁶³ We have already seen how Evelyn described the situation in England by means of a comparison with the state of the Roman Empire under the invasion of the Goths: the turmoil of the recent English civil war being seen as the contemporary equivalent to the classical scene. The retreat, either forced or chosen, from active life provided the setting for the presentation of the Christian philosopher in retirement. This claim hardly needs extensive support considering the

⁶¹ Evelyn's Platonic and devotional involvement with pious women as an expression of the Christian *agape* can be seen as part of this practice. See Keynes, *op. cit.*, p. 254, for a discussion of the devotional handbook written by Evelyn for Lady Godolphin which was eventually given to his wife, Mary Evelyn. On the devotional practice of pious women in the seventeenth century see, Sara Heller Mendelson, *The Mental World of Stuart Women: Three Studies* (Brighton, 1987), and H. Maynard Smith's commentary to his edition of 'The Early Life and Education of John Evelyn', *Oxford Historical and Literary Studies*, xi (Oxford, 1920).

⁶² There is an extended illustration of this in a the long letter from Evelyn to Pepys regarding the construction of a Library. See Evelyn to Pepys, 12 August, 1689 in, Bray, iii, pp. 294 - 311.

⁶³ Evelyn's garden at Sayes Court is referred to as 'Tusculanum' by Jeremy Taylor, in a letter dated 16 April 1656, Bray, iii, p. 71. Kroll suggests that this letter could be seen as a literary 'distillation' of the various elements which go to make up Evelyn's virtuous practice. Taylor admires Evelyn's pleasing domestic scene, reminiscent of the Ciceronian 'philosophical retreat' in the *Tusculan Disputations*. He congratulated him on the publication of his *Lucretius* and dealt at length with the topic of 'friendship'. On the topic of friendship see Jeremy Taylor's *A Discourse of the Nature, Offices and Measures of Friendship with Rules of Conducting it. Written in answer to a Letter from the Most Ingenious and Vertuous M.[rs.] K.[atherine] P.[hilips]* (London, 1657; reprint Chapman and Hall, 1920).

political and ecclesiastical chaos to which Evelyn had returned from his continental tour in 1652.⁶⁴ The horrendous consequences of this turmoil provided Anglican divines with the vocabularies necessary for an intense concentration on the sins of a reprobate nation which had failed (in its chosen role) to complete the Reformation. The killing of Charles I was presented to the nation as a recapitulation of the original sacrifice of the Messiah for a fallen 'Israel'.⁶⁵ As Spurr has shown, in countless sermons the auditors were exhorted to perform intense personal acts of devotion in order to atone and undergo an affective piety which would restore the nation to its Godly state. The 'utilitarian' schemes were likewise undertaken by Boyle and Evelyn in recognition of pious reformation and especially in the perception of personal sin.⁶⁶ After the Restoration it became possible to transform private piety into public virtue.

According to Kroll, Evelyn 'articulated his cultural and personal projects' in various ways:

First, especially in the form of letters, he developed a marked and novel ideal of intimate friendship. Second, with an almost mystical enthusiasm, he appropriated and elaborated the image of hortulan retirement in a number of concrete forms: his renowned garden at Sayes Court (Evelyn's aforementioned Tusculanum and, in Taylor's words, his "Terrestrial Paradise"); his extensive writings about horticulture; and his equally extensive collection of books on the subject. Third, Evelyn patiently explored and articulated the nature of the exemplary phenomenal image, a fascination that unites his concern over the minutiae of printing with his antiquarian and numismatic interests.⁶⁷

The reference to that particular work of Cicero is especially revealing since it contains, among other topics, a dialogue on the therapeutic benefit of the philosophic

⁶⁴ Evelyn became much more active in government affairs after the Restoration. For a brief account of Evelyn's public roles after the Restoration see *DNB*, q.v. 'Evelyn'.

⁶⁵ William Sancroft reporting on Charles' execution said, 'the black act is done, which all the world wonders at, and which an age cannot expiate. The waters of the ocean we swim in cannot wash out the spots of that blood, than which never any was shed with greater guilt, since the son of God poured out his'. Quoted in Spurr, *op. cit.*, p. 9.

⁶⁶ This requires concentration on the devotional practice of the actors and the religious language in which it was expressed. For example, de Beer instances the terms 'pathetic', 'practical' 'profitable', and 'useful' as being the most frequently used epithets by Evelyn in describing the affective power of various sermons. See, Index to de Beer, vi, p. 469.

⁶⁷ Kroll, *op. cit.*, p. 166. Kroll is not exaggerating the 'mystical' ethos of Evelyn's perception of the benefits to be derived from gardens. Graham Parry in, 'Hortulan Saint', refers to the 'visionary lustre' and mystical sense of Evelyn's views on the spiritual powers of horticulture. For a detailed account of the presence in Restoration poetry of the concept of 'hortulan saint' see, Maria-Sophie Rostvig, *The Happy Man. Studies in the Metamorphoses of a Classical Ideal* (vol., i, Oslo/Oxford, 1958).

life in the face of the misfortunes and importunities of private and public affairs. The letter is also significant as Taylor was under sequestration and Evelyn was retreating from the events of the 1650s. This should not be seen as the result of what Weber called 'world-renouncing' dispositions.⁶⁸ Pious and virtuous behaviour in this period was often formulated in terms of a dramatic re-enactment of classical (and early-Christian) tropes. In this particular case the retreat from public life to philosophic-solitude and the use of classical tropes to represent it textually may help to expand, by way of an enrichment of our vocabularies of interpretation, the historian's perception of the motivations of those involved in activities such as 'The Invisible College' or the foundation of the Royal Society. By increasing the degree of precision applied to terms such as 'eirenacist', 'utility', 'duty', 'piety' and 'practice', and treating these vocabularies as representative of a wide spectrum of Christian behaviour it may be possible to explain why individuals in this period are difficult to categorise.⁶⁹

Whilst I wholeheartedly accept Kroll's depiction of Evelyn's humanist self-perception it does however play down his pious Anglicanism which was such a central aspect of his life. Evelyn's 'retreat' into philosophic and spiritual hortulan contemplation needs to be balanced by his perception of the *vita activa* and how man's sinful nature requires a practical reformation located in pious and charitable works.⁷⁰

This is evidenced in much of the literature produced by those involved in

⁶⁸ Merton's thesis neglects any analysis of the call in Puritan literature for a practical and personal reformation in the light of the perception of 'sin'. Merton's use of the Weberian 'Puritan ethos' made no attempt to deal with the enormous amount of doctrinal material which emphasised the importance of 'experience' and effectual religion. The frequency of the parallels drawn between the worldly experience of the traveller, the merchant, the diplomat etc. and a real experiential piety has not, as far as I know, been related to the demand for experimental knowledge in natural philosophy. On the everyday tropes of travel and business used in Puritan devotional literature see, John Morgan *Godley Learning*, esp., pp. 58 ff.

⁶⁹ This is particularly pertinent to the debates over the influence of that range of sensibilities called 'Puritanism' on the intellectual life of seventeenth-century England. See Morgan, *op. cit.*, esp., pp. 9 - 22, for an overview and an attempted solution to the problems of definition and essences regarding historians categories. Morgan suggests that we abandon the search for essences and adopt a 'nominalist' approach which concerns itself more with 'existences'. This coheres well with the focus, adopted here, on the diverse ways in which individuals utilised and reconstructed inherited vocabularies to suit their contingent requirements.

⁷⁰ I have drawn on John Spurr's *The Restoration Church of England*, for this account of the Anglican awareness of 'sin' and the need for a practical renewal as opposed to a 'notional' piety.

worshipful acts of scholarship, including the practice of natural philosophy - Boyle being a paradigmatic case. For this reason the category of 'natural theology' cannot do justice to the manner in which Christian piety found its literary expression. By means of scriptural and classical tropes, piety was manifested practically by the pursuit of 'useful' and charitable works.⁷¹ All intellectual activity, even when clothed in the language of Christian divinity and metaphysics, which did not tend to the general good of the Christian community was labelled ineffective 'notional' religion. This 'notional' knowledge was virulently condemned by its critics, and identified with the emasculated, meretricious, and effete styles and practices associated with scholasticism, atheism and Court culture. Holy living demanded the conjunction of a 'plain style' with 'manly' experimentation in the 'elaboratory' or the garden.⁷² This programme of 'utility' was purveyed by Anglican, Dissenter, and 'infidel' into an agonistic arena where each antagonist charged the other with failing to provide real, or solid, knowledge which would relieve England's ills. The emphasis in all areas of life was on practical experience and the concomitant denigration of mere notional and emasculated knowledge.⁷³

⁷¹ Natural theology' has been presented by historians in the role of a discourse which provides 'proofs' and 'supports' for Christian faith. The emphasis is usually placed, by the historian, on its epistemological function whose task was to convince unbelievers or those requiring intellectual succour. It is rarely located either within the individual's concept of the effects of the Fall or the need to understand God's activity within a corrupt world. Spurr, however, argues that the locus of this Anglican literature - demanding an acute awareness of sin - was the 'National' guilt engendered by the events of the Interregnum and the eventual failure to establish a monolithic national church.

⁷² This concept of masculine knowledge is central in Bacon's own programme and Boyle's interest in 'husbandry' in the early days of his contact with the Hartlib circle should be noted. See Boyle's letter to his tutor Marcombes, *More, Life*, p. 61.. Also the attacks on rhetoric in this period demonstrate the 'masculine' response to the seduction by the feminine charms of the surface attractions of stylistic excesses. Rhetoric was very often represented by the tropes of food or sex where 'dressing' is used to enhance appeal. I should point out that Evelyn had a highly ornate style and was duly criticised for not appealing to a more popular and artisanal class. Ironically, in his diary entry for June 27 1682, Evelyn complained of a preacher who had delivered '[a] *Metaphysical* discourse of the Perfections of God, altogether unintelligible to most of our plain Auditores'. See, de Beer, iv, p. 291.

⁷³ These were programmatic calls for reformation and restoration and care must be taken when comparing textual demands with actual practice. However much the programmes for reform of the seventeenth century demanded the renunciation of authorities for the sake of experience the protagonists did not abandon their discursive heritage. See Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago, 1994) and the review by Keith Thomas in *London Review of Books*, 22 September 1994. Thomas comments 'As Steven Shapin observes in his subtle and learned book, we should get a very misleading impression of the scientific practice of 17th-century England if we were to take this individualistic rhetoric literally. The truth was that the experimental philosophers of the time were just as dependant on the testimony of others as their ancestors had been'. For a more critical review of Shapin's book see,

The presence of an intense discourse on 'sin' was not peculiar to the more extreme Puritan or covenanter. As Spurr has shown Anglican spirituality and homiletics in this period laid great stress on personal responsibility for sin. Boyle and Evelyn at various times in their lives demonstrated this general acknowledgement of the need for personal reformation. For example, Spurr describes how Evelyn on his sixtieth birthday (1680), 'closeted himself away for a whole week to take a solemn survey of his life and sins and to make his peace with God'.⁷⁴ Spurr concurs that far from Anglican churchmen preaching a 'natural religion', they taught that fallen humanity could never be pure - without sin in this life - and could only be as perfect as human frailty allowed. This was to be achieved through a rigorous programme of holy living; the imitation of Christ; and by fulfilling the 'covenant of grace' established through the sacrifice of the Messiah. Furthermore, Spurr argues,

Restoration divines preached that doing good is a fundamental part of Christianity, and this was bound to mean the exaltation of charity, diligence, duties to oneself and neighbour, social virtues and public piety . . . to conclude, as some have, that the Restoration churchmen were peddling a merely utilitarian system of ethics, and promoting it through an appeal to self-interest and prudence, is a bizarre and highly selective interpretation of their views which takes little account of either the clergy's theology or the audiences at which the clergy aimed.⁷⁵

Regarding the behaviour of the various protagonists in the Lectureship, it becomes apparent that the uncovered connections are, as Michael Hunter points out, not so much connections between 'science' and 'religion', or political ideology and appropriate natural philosophy, but more a network of 'acts' formulated by means of inherited vocabularies. Thus, the relationship of the discourses of 'divinity' and 'natural philosophy' should not be treated as causal connections between monolithic categories, but as the interaction of a host of scholarly activities which require a more precise location within contingent debates and programmes. The dichotomous

Mordechai Feingold, *Isis*, 87 (1996), pp. 131 - 39. On the rhetoric of abandoning authorities see, Anthony Grafton *Defenders of the Text: The Traditions of Scholarship in an Age of Science, 1450 - 1800* (Cambridge, Mass., 1994), pp. 2 - 5. For a recent discussion on the notion of restoration and authority in the seventeenth century see, Alvin Snider, *op. cit.*, (*passim*).

⁷⁴ *The Restoration Church of England*, p. 291. Sermons recorded by Evelyn were, according to Spurr, 'uncompromising in their assertions of the "infinite dangers of sin" and "the necessity of crucifying all sinful desires of what sort soever, without the least indulgence to any"', *ibid.* p. 306. See de Beer, iii, pp. 326, 353, 403; iv, pp. 240, 435.

⁷⁵ Spurr, *op. cit.*, p. 307. Many of the Boyle Lectures contain defences of the Christian doctrine of the need for an expiatory sacrifice for the remission of sins: they also emphasise the impossibility of unaided corrupt 'reason' accomplishing such a reformation.

'science/religion' label is ineffective as a descriptive category of the practices of an Evelyn, or a Boyle - or those Boyle Lecturers who incorporated elements of natural philosophy into their sermons. Boyle and Evelyn were fully aware of the distinction between 'divinity', 'husbandry', 'rhetoric' and 'natural philosophy'. However the institutionalised scholastic categories, and the non-institutionalised practices of husbandry, natural histories, or alchemy, were often accommodated to the needs of a monolithic practice of 'holy living' by virtuous lay practitioners who remained outside the discursive boundaries imposed by educational and ecclesiastical monopolies.⁷⁶ This practice, in the case of Evelyn and Boyle, has to be discussed within the context of their own lively understanding of what was conducive to salvation and what was not. The practice of natural philosophy whether in the garden or the laboratory found its *utilitas* in its contribution to personal salvation and the charitable furtherance of the Christian community.

Considering the parity of Christian interests, friendship, and common range of vocabularies which Boyle and Evelyn held to be a universal requirement for a truly pious venture, it is not surprising that Boyle chose Evelyn as a Trustee for just such a venture. Boyle and Evelyn were both protagonists in activities which facilitated the migration of knowledge from its institutional moorings in order to establish it in sites which were to assist in establishing the true Christian community. The notion of scholarly and pious 'gentlemen', competing on an equal footing with their institutional counterparts in the production of creditable knowledge, is a common denominator in the case of Boyle and Evelyn. There was, furthermore a perceived union between practice and piety. This found its literary expression in the combination of classical tropes, the language of restoration and reform brought about through the 'lively' perception of the need for a true practical Christianity.

The main problem with the terms 'Latitudinarianism' and 'natural theology' is their implicit denial of the role of an affective component in individual piety. I will close this section with an apposite example, from Spurr, which illustrates this

⁷⁶ Once again this was a pure Baconian ideal, after all Bacon could be seen to have drawn on Humanist criteria of restoration, allied to a programme of reformation toward 'holy living' driven by the conception of man's post-lapsarian sinful nature. This manifesto was made explicit in Sprat's *History of the Royal Society* (1667), where virtue, civic duty, plain style, and the 'husbanding' of nature as divine worship, was combined into a programme for the benefit of the Christian polity: there was therefore room for 'works' even within a Calvinist emphasis on the absolute need for sanctifying grace.

affective element.

Evelyn's diary for Good Friday 1687 perhaps affords the best available example of how sermon, private devotion and the sacrament could work together as they were supposed to create an effective piety. At St. Martin-in-the-Fields, Evelyn heard Tenison preach 'a most pathetic discourse describing how our blessed Saviour had our sins transferred on him'. When Tenison described 'the infinite charity of God in sending his Son for this end and our ingratitude in being no more affected with it, he drew tears from many eyes: the holy sacrament followed, of which I participated after a very solemn preparation and to my extraordinary comfort: the Lord make me mindful and thankful'.⁷⁷

Thus Evelyn acknowledged - doctrinally he was correct according to the formulation in the Thirty Nine Articles - that 'even the most righteous were sinners', and that each individual required the assistance of sanctifying grace.⁷⁸ However, the use of secularising and rationalising terminology by historians removes Anglicanism from the arena of affective piety and fails to provide a properly nuanced account of Boyle's relationship with, and nomination of Evelyn.

3. 4. Henry Ashurst (1645 - 1711).

Evelyn's diary entry for January 13 1692, provides us with the following details regarding the first meeting of the Trustees

Being by the late Mr. Boile[sic], made one of the Trustees for his Charitable Bequests, I went this morning to a Meeting of the Bishop of Lincoln, Sir Robert Ashwood [sic], & Scrjeant Roderith [sic]; to settle that Clause in Mr. Boyle's will, which he had left for Charitable Uses, & Especially for the Appointing & Electing a Minister to preach . . .⁷⁹

The reason why Boyle chose Ashurst and Rotherham as Trustees has to involve a certain amount of conjecture since, in comparison with the quantity of data on Tenison or Evelyn, there is scant information about them. However, the limited

⁷⁷ Spurr, *op. cit.* p. 369. Demonstrating the need for an holy life and insisting that practice must take precedence over speculation was, as Spurr observes 'the main preoccupation of the church's preachers, catechists, theologians and writers', *ibid.*, p. 286. See, de Beer, iii, pp. 339, 538, 564; iv, pp. 37, 164, 167, 258-9, 288, 291, 355, 451, 630. This also helps to pin-point the exact meaning of the term 'pathetical' in the title of Boyle's *Seraphic Love* - the work was intended to 'move' the reader through an affective experience.

⁷⁸ For Evelyn's attack on the Pelagian view and the sects 'who ascribed too much to our own will' see, de Beer, iv, p. 334. Also, William H. Frere, *A Devotionarie Book of John Evelyn . . . Now first published with an Introduction by W. Frere* (London, 1936). For a contemporary text which dealt with personal devotion - written by a leading Anglican scholar - see, Edward Bernard, *Private Devotion and a Brief Explication* (Oxford, 1689).

⁷⁹ de Beer, v, p. 88. Evelyn has obviously made a mistake in referring to Ashurst as 'Sir Robert Ashwood' and Rotherham as 'Sarjeant Roderith' and in a later entry in his diary, December 14 1692, he gives Rotherham's name correctly.

biographical data can provide new, and revealing, insights into a network of relationships by highlighting material not accorded significance in the standard commentaries. The emphasis in this section will be on Boyle's connection with the pious and charitable work of the propagation of the Gospel and the strong links with the dissenting community which this connection entailed.

The Ashurst family were 'wealthy and benevolent' London merchants who had maintained a long tradition of Nonconformity. De Krey describes them as 'Turkey Merchants', members of the Levant traders in the City.⁸⁰ This group of London traders, according to de Krey's comprehensive study, although few in numbers, 'included more city leaders than any other branch of London commerce'.⁸¹ They were predominantly Whig and were in competition with the more Tory dominated East India Company which held a royal Monopoly and the favour of the crown. They dominated London affairs in this period. However, as the century progressed they failed to sustain entrepreneurial drive and soon after the end of Anne's reign 'the Levant trade suffered a gradual but irreversible decline'.⁸² They were, as De Krey observes,

Bound together by their wealth, status, common economic interests, and small numbers, the Levant traders were also a highly inbred and endogamous mercantile elite.⁸³

The Ashurst family in particular also had intimate links with the most prominent and ablest dissenters of the day: Richard Baxter, Henry Newcome, Philip and Matthew Henry, John Howe, Daniel Burgess, William Penn, and Joseph Stennet.⁸⁴ This ministerial leadership was sustained by patronage from families who were at the heart of commercial and political power in the metropolis, London being particularly strong in dissenting traditions at all levels of the social spectrum.

⁸⁰ Gary Stuart De Krey, 'Trade, Religion, and Politics in London in the Reign of William III.', PhD thesis, University of Princeton (2 vols., Michigan/London, 1978), i, p. 129. Narcissus Luttrell *A Brief Historical Relation of State Affairs from September 1678 to April 1714* (6 vols., London, 1857), v, pp. 82 - 3, for remarks on Henry Ashurst's role as colonial agent for various states over a twenty year period. Ashurst's function was to protect the dissenting interest over the established regime.

⁸¹ *Op. cit.*, p. 39. I have used De Krey's work as my main source for the connections between dissent and commerce in this period.

⁸² De Krey, *op. cit.*, p. 40.

⁸³ *Ibid.* p. 42.

⁸⁴ *DNB*; On Boyle's relationship with Baxter and Howe see chapter two above.

Geoffrey Holmes has established 100,000 nonconformists in the City, i.e., '20% of the national strength of dissent and 15 - 20% of the Greater London population'.⁸⁵ Thus, however much Non-conformity was vilified from Anglican pulpits, it could not *de facto* be relegated to the category of radical troublemakers. The term 'dissent' (or Non-conformity) should not be taken as implying rigid doctrinal observance and furthermore it is difficult to identify either dissent or conformity with institutional precision without a consideration of personal practice. The theological attitudes and liturgical observances of many laymen were ambiguous and often determined by the contingencies of marriage (and its attendant family obligations), commerce, the legal obligation of oath-taking to secure place, and personal piety.⁸⁶

The concepts of 'piety', 'good works' and the 'solid' activity of mercantile practice are characterised by the Ashurst family. Richard Baxter described the elder Henry Ashurst as

the most exemplary person for eminent sobriety, self-denial, piety, and charity that London could glory of, as far as public observation, and fame, and his most intimate friends could testify.⁸⁷

The connection of the Ashurst family with Baxter widens the dissenting interest to include John Rotheram. Henry Ashurst retained Rotheram, in 1685, as one of the counsel in the defence of Baxter who was indicted for seditious libel stemming from the publication of his *Paraphrase of the New Testament*. Rotheram had also, two years earlier, been the draughtsman of the plea lodged by Algernon Sidney in his trial for high treason.⁸⁸ The case of Sidney, the renowned Republican and suspected Regicide, was unsuccessfully defended and he suffered execution.⁸⁹ Although the

⁸⁵ *Op. cit.*, p. 103. Geoffrey Holmes, *Religion and Party in Late Stuart England* (London, 1975).

⁸⁶ De Krey's comments, *op. cit.*, p. 119, on the practice of occasional conformity are revealing - 'dissenters sometimes served as church wardens, were often buried in parish churches, and are even known to have left bequests to parochial clergymen. Numerous paths led through occasional conformity'. De Krey shows little interest in the practice of personal piety by dissenters and is only concerned with the prosopographical and statistical concerns of the social historian. Thomas Barlow is an apposite example of an institutionally aligned Anglican who held dissenting doctrinal views.

⁸⁷ *DNB*, q. v., 'Henry Ashurst'.

⁸⁸ The *DNB* confuses the issue by claiming that it was the father who was instrumental in Sidney's defence. It was impossible for Henry the elder to have had a role in the trial of Algernon Sidney as this took place in 1685, by which time the Elder Ashurst was already dead. Interestingly, one of the witnesses called in Sidney's defence was Lord Paget, Ashurst's father-in-law

⁸⁹ Evelyn, who was present at Sidney's execution makes the following entry in his diary, 'When he came to the scaffold, instead of a speech, he told them only that he had made his peace with God,

legality of placeholding and power was dictated by statute and constitutional conformity, actual practice and the practice of occasional conformity could effect a departure from the dictates of the statute book enabling dissenting families to attain enormous prestige and power.⁹⁰

The Ashursts were established in Hackney and Henry, the Trustee, became Commissioner of Hackney Coaches in 1694. He was MP for Truro 1681-95 and for Wilton in Wiltshire in 1698-1702. De Krey refers to the Ashursts as 'the premier Presbyterian family in London at the end of the seventeenth century . . . one of the most influential dissenting families in the country'.⁹¹ The eventual decline in Levant trading notwithstanding, the brothers William and Henry were very successful commercially. In 1694 Sir William invested £3000 in the Bank of England of which he was director from 1697 - 1714. In a more traditional vein, Sir Henry invested in land and purchased the manor of Waterstock in Oxfordshire at the cost of £16,000, plus the expense of building a new manor house.⁹² Furthermore, in his will he bequeathed almost £1000 to be used for various charitable purposes. Both brothers were highly active in dissenting projects. William succeeded his father-in-law as Governor of the New England Company and Henry became manager of the Presbyterian Fund. Their generosity to Presbyterian clergymen continued the

that he came not thither to talk, but to die: put a paper into the sheriff's hand, laid down his neck, and bid the executioner do his office'. To detect the tenor of Evelyn's sympathetic description compare it with the following comments from a bishop and from the Duke of York. According to the former he 'died with the same surliness wherewith he lived', and the latter, 'very resolutely, and like a true rebel and republican', quoted in *DNB*, q.v., 'Algernon Sidney'. The issue here is not the dramatic spectacle of how Sidney died but the extremely important one of why two of the Trustees assisted in the defence of a suspected regicide and known republican; why one of them was connected by marriage to an aristocratic family from which Sidney obtained a defence witness; and why Evelyn, the Royalist, gives an almost 'Socratic' death-scene, of nobility and fortitude in the face of extinction, on the part of a 'criminal' implicated in a crime which drew mythological and hagiographic comparisons between the 'martyrdom' of Charles and the atoning death of Christ.

⁹⁰ for further connections between the prominent dissenting families of the City see de Krey, *op. cit.*, pp.105 ff. J. R. Woodhead, *The Rulers of London, 1660-1689: A Biographical Record of the Aldermen and common councilmen of the City of London* (London, 1965), for further information on the Ashurst family.

⁹¹ *Op. cit.* p. 129; Cockayne, iv, p.151; Woodhead, *op. cit.*, p. 19. Even though Henry was knighted in 1688, created baronet and made an Alderman of the City of London he had nevertheless supported the exclusion of James from the throne in 1681. See Luttrell, *op. cit.*, for various references to Ashurst's remarks in parliamentary debates which give some indication of his support for the settlement of 1689.

⁹² De Krey, *op. cit.*, p. 130. For a discussion on the dissenting and Huguenot families who controlled the financial life of London see John Carswell, *The South Sea Bubble* (London, 1961), esp. Chapter One, 'The Commercial Revolution', pp. 1 - 21.

practice established by the elder Henry Ashurst: for example, Henry the Trustee, bequeathed £800 to Matthew Henry, the renowned dissenting minister, and instructed him to use it 'for the glory of God'.⁹³ De Krey concludes

The influence of the family continued long into the eighteenth century. A son of each brother sat in the House of Commons, and seven Ashursts of succeeding generations were members of the New England Company.⁹⁴

Jacob and other commentators have very little to say about either Ashurst or Rotherham, as can be seen in the usual summary dismissal of their involvement in the lectureship. According to Jacob, 'Ashurst and Rotherham, played minor roles in the selection of the Boyle lecturers.'⁹⁵ Whilst *prima facie* it has been accepted that the involvement of Tenison and Evelyn outweighs that of Ashurst and Rotherham we must not prejudge the issue when discussing Boyle's selection of his Trustees. Jacob describes how 'each [Trustee] was chosen because of his long friendship with Boyle and, we suspect, for his involvement in ecclesiastical and social affairs'.⁹⁶ It is unsurprising that Boyle chose Trustees with prominent social or ecclesiastical involvement. The nature of Boyle's bequests - often stipulating the charitable distribution of money to ecclesiastics or missionary projects - demanded the appointment of trustworthy and effective personnel.⁹⁷ What the Jacob thesis fails to convey is the strong dissenting character of that social and ecclesiastical involvement.

Because the presence of Non-conformity has been ignored in discussions of the Lectureship, Boyle's own relationship with dissent has also been overlooked. Boyle was prominent in the New England Company, a venture which had its origins in Nonconformity during the 1640s and remained for the next fifty years still predominantly controlled by the dissenting community. The Ashurst family had actively supported this venture from its inception.⁹⁸ Boyle's connection with dissent

⁹³ De Krey, *op. cit.*, p. 130.

⁹⁴ *Ibid.*, p. 131. I have provided details on the Ashurst family to show that Boyle's decision was not simply based on friendship but on the pragmatics of power. The Sermons were to take place in London therefore it was advantageous, in both religious and political terms, to choose a member of such a prominent family, renowned for its charity, who would prevent the monopolising of the Lectureship by rigid Anglican interests.

⁹⁵ *NER*, p. 148. Also, John J. Dham, 'Science and Apologetics in the Early Boyle Lectures', *Church History*, 39 (1970), 172 - 186.

⁹⁶ *Op. cit.*, p. 147.

⁹⁷ For details of the various bequests see Maddison, *op. cit.*, pp. 198 ff.

⁹⁸ De Krey, *op. cit.* p. 130 for the Ashurst's role in colonial affairs. De Krey observes (p. 151) that

was sustained through his own active support for the Company which received its incorporation in 1662 as the 'Company for the Propagation of the Gospell in New England and the Parts adjacent in America'.⁹⁹ The membership of this company was not entirely nonconformist: those who were excluded after the Restoration had their places taken by such Restoration courtiers as the Earls of Clarendon, Southhampton, and Anglesey. The aristocratic, non-courtier, Robert Boyle was made 'governour' of the Society in 1662, and remained in this position until he retired in 1689 due to failing health.¹⁰⁰ According to Kellaway, of those whom Baxter referred to as 'many Godly' and 'able Citizens', 'none threw himself into the Company's affairs with more energy than the newly named Governor - the Honourable Robert Boyle'.¹⁰¹ Boyle was also a member of the Council for Foreign Plantations and kept a close eye on the affairs of the colonies, particularly those relating to the treatment of dissenters. In 1664 he was approached by the Governor and Court of the Massachusetts Bay colony who desired him to use his influence at court to ensure that the Commissioners of Charles II did not undermine the religious liberties of the colony. When the Massachusetts colony itself showed too great a severity in its treatment of dissenters, he wrote a letter to John Eliot condemning their behaviour:

This severe Proceeding seems to be ye more strange and ye less defensible in those who having left their native country & crossd ye vast Ocean to settle in a wilderness that they may there enjoy ye liberty of worshipping God according to their own Consciencences, seem to be more engaged than other men to allow their brethern a share in what they thought was so much all Good mens due.¹⁰²

five of the major dissenting London families were 'bound to the colonies by religious and commercial ties'. For information on the Company see, W. Kellaway, *The New England Company, 1649 - 1776* (London, 1961).

⁹⁹ The company was originally named The Society for the Propagation of the Gospel, but at the Restoration the Society took the requisite political steps in order to ensure its continuation. For a discussion of the complex political machinations both to prevent the society's success and to ensure it see Kellaway, *op. cit.*, pp. 41 ff.

¹⁰⁰ Boyle was named as the first Governor in May 1661 according to the charter granted by the Privy Council.

¹⁰¹ Kellaway, *op. cit.*, p. 47.

¹⁰² Royal Society, Boyle Letters, vi. 94, quoted in Kellaway, *op. cit.* p. 48. It is interesting to note that the main thesis of J. C. D. Clarke's *The Language of Liberty: Political Discourse and Social Dynamics in the Anglo-American World* (Cambridge, 1994), places very strong emphasis on the continuous conflict between Anglicanism and dissent in Anglo-American relations. Clarke maintains that we cannot understand the American Revolution without analysing the religious and discursive factors in which this conflict took place. I would like to thank J. R. R. Christie for directing my attention to Clarke's study.

Although Boyle was socially and institutionally committed to the Anglican church, he was also widely known for his moderation toward dissenters. Moderation - which in this context ought not to be identified with doctrinal laxity or the support of a theological free-for-all - was an important part of his humanistic Christian piety. The example of Samuel Parker's *Discourse of Ecclesiastical Polity* (1669) will serve to demonstrate the issues involved in characterising Boyle's support of moderation.¹⁰³ According to Parker, and other critics of Toleration, Dissenters wilfully sought the overthrow of Church and State since they were incapable of rationally conducting a debate - therefore they ought to be silenced and not reasoned with.¹⁰⁴ Boyle, on the other hand, having intimately dealt with the problems posed by his own conscience was willing to allow its operation in many cases and to accept its findings even though they conflicted with his own institutional alliance. Thomas Barlow in his *Several Miscellaneous and Weighty Cases of Conscience* (1692) dealt specifically with 'Toleration of Protestant Dissenters' (Case no. 1). This case was produced at the request of Boyle and demonstrates that 'toleration' might only ever be a 'legal' toleration for other faiths to exist undisturbed side by side with the 'true' religion. This legal approbation was therefore not the doctrinal sanctioning of the beliefs of the tolerated community.¹⁰⁵ Boyle considered that instituting such legal sanctions would have provided a relatively harmonious Christian polity. The main benefit to be derived from this tolerant legalisation would have been to undermine those systems of thought which Boyle considered as very real threats to Christianity - atheism, deism, and the highly sophisticated doctrinal structures of non-Christian systems.

Boyle's charity extended to all Christians and expressed itself in public

¹⁰³ Parker's work sparked off an intellectual battle in which issues of 'reason' and 'enthusiasm' were foremost. He was very often associated with Hobbes due to his extreme Erastianism and support of the absolute power of the ruler. The discussion of the role of reason and the extent of its proprietorial boundaries was also addressed by Boyle but he had little time - outside of appointing limits to reason in matters of faith - for the technical debates.

¹⁰⁴ Richard Ashcraft, *Revolutionary Politics & Locke's Two Treatises of Government* (Princeton, 1986), pp. 42 ff.

¹⁰⁵The bookseller's 'Preface to the Reader' informs us that 'The Case of Toleration of Christian Dissenters, was written to, and at the Request of the Honourable and Learned Mr. Robert Boyle, 1660. [S]oon after the Restoration of K. Charles II.' (A3). The work was not published until 1692 - it appears that Barlow had been 'warned off' and told that the publication was detrimental to his career. See, Birch, *Life of Boyle*, quoted in *DNB*, q.v., 'Peter Pett' - this passage also contains a lengthy discussion of Boyle's moderation and charitable responses to dissenters.

enactments of the ‘experimental’ and ‘solid’, rather than the formulaic, and systematic reconstruction of authoritative material in the more scholastic and institutionalised treatises of the universities. It is this pious practicality which Boyle recognised in the charitable work of the dissenters. He was prudent enough to perceive that a hegemonic Christianity was an impossibility while Christians continued to persecute each other over doctrinal issues. As in the case of Evelyn, notional religion was considered worthless just as a notional metaphysics or natural philosophy was useless in the restoration of a true ‘Terrestrial Paradise’.

One of Boyle’s most renowned associates among the dissenters was Richard Baxter. We have already seen how Baxter commended Boyle for his Godly practice of natural philosophy; the same letter also reflects on the need for an ‘*affective, practicall serious worke*’ in order to ‘perceive the difference betwixt a pleasant easie dreame, & a waking working knowledge’.¹⁰⁶ Both Boyle and Baxter were adamant that piety must be grounded in an affective religion and that knowledge of the true nature of humanity would lead to an expression of universal holiness. Baxter expressed this in the following passage which is worth citing in full:

He that hath well learnt in the Alphabet of his Physicks, wherein a MAN doth differ from a Bruit, hath laid such a foundation for a Holy life, as all the Reason in the world is never able to overthrow. ffor by knowing his *ffaculties & Capacities*, he will quickly knowe their end *End* and *Use*: & his Relations to his Creator, his efficient, Divigne ffinal Cause: That his *Nature* was formed to be Holy, even to Knowe & Serve his Maker as truly as the lower creatures are formed for our service that to Love God above all, & to serve him with all our power & guiftes, is as unquestionably the duty of man, as it is the use of a horse to Convey us, or of a Knife to Cut, & much more, because the aptitude & obligation were more essentiall to us: And he will as easily know that all this duty is not to be performed in vaine, & that the Rectitude, perfection & usc of Nature, was never intended by our Creator to be our Misery, & therefore Holynes is the way to Happines.¹⁰⁷

Boyle’s high opinion of Baxter may be seen in his description of him as ‘the fittest man of the age for a casuist, because he feared no man’s displeasure, and hoped for no man’s preferment.’¹⁰⁸ Furthermore, the dissenting minister William Bates, who

¹⁰⁶ Baxter to Boyle, 14 June 1665; Boyle, *Works*, pp. 165-20.

¹⁰⁷ *Ibid.*.

¹⁰⁸ For a discussion of Boyle’s concern with ‘conscience’ and oath-taking, see the studies of Michael Hunter cited in chapter One of this study. Also, Richard Burgess Barlow, *Citizenship and Conscience: A Study in the Theory and practice of Religious Toleration in England during the Eighteenth Century* (Philadelphia, 1962). Attention is drawn to the library catalogue recently published by Harwood as it demonstrates the range of ‘puritan’ divines in Boyle’s library. However,

was pastor of the Presbyterian church at Hackney, dedicated his funeral sermon on Baxter to Henry Ashurst.¹⁰⁹ In the dedicatory epistle Bates called Ashurst the 'Right Worshipful, and his [Baxter's] Honoured Friend'. Bates remarks on the peculiar honour shown to Henry Ashurst in that both Boyle and Baxter had named him among the Trustees of their respective wills:

That two who so excell'd in Wisdom and Goodness should commit to your Trust the disposal of their Estates for the Uses of Piety and Charity, is a more Noble Testimony of their Esteem of your Prudence and inviolable Integrity.¹¹⁰

It was also through Bates that moves for Comprehension were made with Tillotson and Stillingfleet: this was violently opposed by the bishops, who were determined to restore the hegemony of a church which had recently returned from sequestration and to reinstate the divine sacerdotal status of a priesthood which had survived clandestinely during the Interregnum. I suggest that, in Boyle's case, 'toleration' in this context, ought to be construed, neither as a radical confrontation with an entrenched High-Church hierarchy nor as the plea for the institutionalisation of alternative forms of worship, but as an act of protection for a desired hegemonic Christianity, which would transcend confrontation, and manifest its effectiveness in the practical and experimental enactment of the virtuous and holy life. Furthermore, it also indicates where the 'non-confrontational' clause, in the codicil relating to the will, ought to be located. Boyle's intimate contact with the Ashurst family in the New England Company reinforced this decision, thus ensuring that the pious and missionary activity which had occupied him for twenty seven years would continue despite infirmity or death. I must reiterate my emphasis on the plurality of charitable legacies in the will as in fact Evelyn does in the passage quoted above. In the will he made it very clear that propagation of Christianity *via* the 'Companies' must receive priority in the 'use' of the legacies. The powerful influence of dissenting families and

Michael Hunter has cast doubt on the nature of this document and the question of whether or not it describes Boyle's library. Considering the range of materials in other library catalogues published in this period it is difficult to draw particular significance from the presence of specific authors in any collection.

¹⁰⁹A *Funeral-Sermon for the Reverend, Holy and Excellent Divine, Mr. Richard Baxter, who deceased December 8, 1691 with some Account of His Life* (London, 1692). Anthony à Wood refers to the connection between Baxter and Boyle, *via* Bates's dedicatory epistle to that sermon, in which Bates laments the passing of two great proponents of Christian piety within a short space of each other - Boyle and Baxter died in late 1691. see, Wood, *Fasti Oxon.*, q.v. 'Boyle'.

¹¹⁰ *Ibid.*.

the reputation of their ministers for piety and learning was not lost on Boyle even though his institutional and family obligations bound him to the Anglican establishment. The Ashurst family, with its trading interests of the 'Companies' and its experiences with charitable and missionary activities, was a highly appropriate choice.

Moreover, it is important to distinguish between the 'executors' of Boyle's last will and testament and the Trustees responsible only for that bequest in the codicil relating to the Lectureship, as the two groups ended in conflict in the Chancery Court over the management of Boyle's estate soon after the inauguration of the lectureship.¹¹¹ The only figure common to both these groups was Ashurst. When Lady Ranelagh died (a few days before Boyle's own death), Boyle added another codicil (no. 7) to his will and appointed Ashurst to be one of his executors in place of his sister:

I do therefore in her steede & Place hereby Make Ordaine & Appoint my very Loving Friend Sr Henry Ashurst of the Parish of St Sepulchures in the County of Middx Knt & Baronett to be one of the Executors, in Trust of my said Last Will & Testamt.

Boyle's directions to the executors were, that they take 'special Care to discharge the Trusts by mee therein them reposed & more especially that part of my Will, That I had particularly Recommended to the Care of my Dearest Sister Ranelagh'.¹¹² These particular 'cares' concern other charitable bequests involving support for pastoral ministers and the propagation of the Gospel. Boyle's terms are as follows:

But I doe chiefly Recommend unto her and them the laying out of the greatest part of the same for the Advancement or Propagation of the Christian Religion amongst Infidells.¹¹³

He also included various schemes to lighten the burdens of those ministers in Ireland who had suffered as a result of impropriated ecclesiastical lands, of which the Boyle family and Robert in particular had benefited enormously, and for the widows and

¹¹¹ Maddison, *Life*, pp. 205 - 6. The trouble concerned the suggested mismanagement of the bequests by the executors and therefore a neglect of Boyle's trust. This makes the argument for a homogeneous united cabal - putting into action a specific social programme which used the lectureship as a forum - all the more difficult to support. It weakens any attempt to draw within the confines of a distinct boundary Boyle's intentions and the resulting management of the Lectureship.

¹¹² *Ibid.*, p.281.

¹¹³ *Ibid.*, p.

children of ministers who had died subsequent to deprivation. This was a constant matter of conscience for Boyle.¹¹⁴ It was mainly dissenting ministers who suffered and this provides a further clarification of Boyle's choice of Trustee: he appointed a member of a well established dissenting family, whom he refers to as 'my very Loving Friend' to execute those charitable portions of his bequests which relate to the suffering caused by conflicting Christian denominations and for the propagation of a non-denominational Christianity - the latter charge carried the precise qualification that there was to be no conflict between Christians in the execution of this duty.

There is no record of Ashurst's theological or doctrinal views: my positioning of him within this nexus of civic piety and holy living is concomitant on the decision of Boyle and the network to which both Boyle and the Ashurst family belonged. I suggest that the reason for Boyle's inclusion of Ashurst among the Trustees cannot be explained in terms of doctrinal latitude, or a liberal theological outlook but is best accounted for by resorting to the complex relationships and vocabularies generated by an active participation in acts of piety, charity and scholarship. The management of the lectureship was furthermore a legal responsibility effected by the trust placed on the Trustees by Boyle and their duty to honour that trust. This legal duty may help to account for the presence of the lawyer, Sir John Rotherham.

3. 5. John Rotherham (1630 - 1696).

Since there is less information available on Sir John Rotherham than any of the other men involved in the Lectureship any account of Boyle's choice of him must be highly tentative. Wood provides the following vignette of Rotherham's career.

[He was] made fellow by the visitors in 1648, and afterwards became a barrister of Grey's inn. In June 1688 he was, among other counsellors, (dissenters from the Church of England) called by the writ of King James II. to take upon him the state and degree of serjeant at Law, and being sworn at the Chancery-Bar on the 8th. of the same month, was in the beginning of July following made one of the barons of the Exchequer, and by the name of baron Rotherham he went the Oxford circuit in the latter end of said month.¹¹⁵

¹¹⁴ Hunter, 'The Conscience of Robert Boyle: Functionalism, "Dysfunctionalism" and the Task of Historical Understanding', in Field, J. V. and F.A.J. L. James eds., *Renaissance and Revolution: Humanists, Scholars, Craftsmen, and Natural Philosophers in Early Modern Europe* (Cambridge, 1993), 147 - 59.

¹¹⁵ Wood, op. cit., iv, p. 170; *CSPD* contains various references to Rotherham and his

Other sources which contain accounts of Rotherham's career expand slightly on these brief details. Foss informs us that he was admitted as a Fellow of Lincoln College in 1648 and that he was related to Archbishop Rotherham, the second founder of the College and Lord Chancellor during the reign of Edward IV.¹¹⁶ He graduated BA in 1649 and MA in 1652; he was admitted to Gray's Inn, August 7, 1647 and called to the bar in 1655. Rotherham adopted the 'popular side in politics and he drew the plea which Algernon Sidney put in on his trial'.¹¹⁷ This seems to imply that Rotherham had Republican sympathies. In the round of promotions and preferments which James offered to dissenters in 1688, Rotherham was made serjeant-at-law on 18 June and promoted to Baron of the Exchequer on 6 July. He received a knighthood six days later and on 23 October he took the oath and test.¹¹⁸ However, as Foss rather acidly puts it:

his judicial career was not of long duration, terminating a few months afterwards with James's flight from the kingdom; and leaving him with the title of knighthood and the grade of a serjeant, to resume his practice at the bar.¹¹⁹

In 1689 he was examined before the House of Lords, presumably because he had received such favour from James. His defence was that even though he had been promoted by James, he had made it quite clear that he did not support the dispensing power and that he considered it contrary to both law and reason. Consequently he was much surprised when he actually received promotion from James, as he 'thought it was enough to have hindered any man from being a judge, so freely to declare his opinion as he had done'.¹²⁰ This was obviously not considered an adequate defence, since he lost his seat on the bench.

Rotherham was one of the counsel retained by Henry Ashurst for the defence of Richard Baxter. Thus we can assume that he held dissenting principles and the favours shown him by James resulted from this beleaguered monarch's attempt to

commissions.

¹¹⁶ Edward Foss, *The Judges of England; With Sketches of their Lives* . . . (9 vols., New York, AMS Press, 1966: facsimile reprint of the original publication, vols. 1 - 6, 1848, vols., 7 - 9, 1864), vol. 7, pp. 271 - 3. See references above to the trial of Sidney.

¹¹⁷ William Cobbett, *State Trials*, ix, p. 498.

¹¹⁸, See, *DNB*, q.v., 'John Rotherham'.

¹¹⁹ Foss, *op. cit.* p. 272.

¹²⁰ Cobbett, *op. cit.*, ix, pp. 988 - 9.

woo the dissenting community. As an illustration of political trade-off in this period consider the nature of Rotherham's defence of Baxter: he tried to argue that the latter's *Paraphrase of the New Testament* was not an attack on episcopacy, but was 'directed exclusively against the prelates of the church of Rome'. Judge Jeffries, renowned for his harsh treatment of dissenters, laughed this out of court. Moreover, this, 'attack on Rome' defence, did not preclude Rotherham from accepting both a barony and a knighthood, three years later, from a Catholic monarch who was in the process of harnessing Nonconformist allegiance and making overtures of general toleration to insinuate Catholic seekers into prominent places. We may dismiss Bramston's character assessment of Rotherham, that he was 'always phanatic', as somewhat pejorative in the light of their political alignments. However, observing the career trajectory of Rotherham, there may have been justification in the claim that he would support 'any thing to be preferred'.¹²¹ According to the *DNB*, Rotherham possessed such an extreme hatred of episcopacy that on the acquittal of the 'seven bishops' - committed to the tower for refusing to read James's Declaration of Indulgence in 1688 - he 'sneered at them as writers of bad English, and fit to be 'corrected by Dr. Busby for false grammar'.¹²² However, Foss explains this attack on the bishops as resulting from his desire not to make his true sentiments known to James, by resorting to a criticism of the bishops' stylistic faults and thereby avoiding the political demands of James's instructions to castigate their behaviour. James had instructed that, notwithstanding the acquittal of the seven bishops, the judges were to speak against them from the bench. This was probably not a difficult task for a dissenting judge who would institutionally resent what he considered to be the hegemonic tendencies of Episcopacy and its concomitant disrespect for the law in favour of arbitrary clerical power. Sir Peter Pett in his reflections on Boyle's will refers to Rotherham as 'a learned dissenter' and that he was

a concurrer with the others in asserting of his Majesty's dispensative power, & who in the giving the charge at the Assizes in the Country pursued the Instruction given by the Lord Chancellor to him & the rest of the Judges to magnify the King's goodness & his justice in his declaration for liberty of Conscience, took occasion (as I am informed) to inveigh against the Church

¹²¹ Bramston, *op. cit.*, p. 311.

¹²² See Norman Sykes, *From Sheldon to Secker*, p. 83.

of England, & say that the Church of England is a bloody [sic] church.¹²³

In the context of Boyle's decision regarding the Lectureship Rotherham should be seen as the means of exercising control over the tendency for ecclesiastical institutions to predominate over the desires of individual members.

Since Rotherham died around 1696 his involvement in the Lectureship was relatively short-lived. Interestingly, of the few recorded cases of conflict over choice of lecturer, Rotherham was responsible for one such disagreement - resulting in Bentley's failing to be reappointed for a second year (1693) in favour of Rotherham's choice of Richard Kidder. Evelyn has the following entry for 14 December, 1693:

With much reluctance we gratified Sir J. Rotherham, one of Mr. Boyle's trustees, by admitting the Bishop of Bath and Wells to be lecturer for the next year, instead of Mr. Bentley, who had so worthily acquitted himself. We intended to take him in again next year.¹²⁴

There is no record of any personal contact between Boyle and Rotherham consequently the reasons for Boyle's choice of him as Trustee can only be based on circumstantial details and the links among the wide acquaintanceship forged by Boyle in the pursuit of his charitable programmes. Desiring the presence of a legal mind among the Trustees, Boyle may have been influenced by Ashurst's recommendation having previously used Rotherham's services. This would account for Boyle's choice of a dissenting lawyer and adds further weight to the view that Boyle's moderation towards dissenters was much greater than has hitherto been recognised. Boyle was vehemently hostile to religious persecution - he had institutional links with powerful dissenting families and several dissenting divines had written doctrinal tracts at his instigation. Hunter points out that the difficulty in locating Boyle's 'churchmanship'

results from the confusion caused by the widespread but vague use of the term "Latitudinarian" to describe the religious outlook of Boyle and others associated with the new science: this bears an imperfect relation either to the

¹²³ I would like to express my thanks to Michael Hunter for drawing my attention to this source. See, *Robert Boyle By Himself and His Friends: with a fragment of William Wotton's lost Life of Boyle* (London, 1994). We have to be wary of taking Pett's assessment of Rotherham too uncritically especially as Pett describes himself as 'an unworthy member of the Communion of the Church of England in the way of Archbishop Sancroft'. Here, Pett was aligning himself with the Non-Jurors, or at least with the high-church party. Sancroft refused to take the oath to William and Mary. On the events relating to the Non Jurors see, J. H. Overton, *The Non-Jurors: Their Lives, Principles and Writings* (London, 1902); G. Every, *The High Church Party 1688 - 1718* (London, 1956). On Pett, see *DNB*, q. v. 'Peter Pett'.

¹²⁴ Evelyn makes a perfunctory and dismissive reference to Kidder's performance - 'Asserting the Doctrine of Christ, against the Jewes, with the usual Topics, but speaking nothing extraordinarily', *Diary*, v. p. 126.

way in which the word was used at the time, or to the most crucial divisions in English religious life in those years.¹²⁵

Hunter makes the further observation, that 'in the spectrum of religious liberalism in Restoration England . . . Boyle was arguably closer to the nonconformists than he was to Latitudinarian Anglicans like Joseph Glanvill'.¹²⁶ Furthermore, the number of dissenters involved in Boyle's last will and testament cannot be ignored. Rotherham was the legal presence among the Trustees and this fits well with Boyle's practice of consulting legal experts in other matters where it hardly seemed necessary.¹²⁷ However, what is extraordinary about Boyle's choice of both Rotherham and Ashurst is that he chose two prominent dissenters who were instrumental in defending Algernon Sidney - a suspected regicide later executed for high treason. The influence of the dissenting community on Boyle's life and bequests must throw further doubt on the role of the Lectureship as an Anglican exercise in social control.

¹²⁵ Hunter, *op. cit.* p. lxx

¹²⁶ *Ibid.* p. lxxi. Richard Ashcraft substantiates this claim, see his 'Latitudinarianism and Toleration: Historical Myth versus Political History', in Richard Kroll et al., eds., *Philosophy, Science and Religion in England 1640 - 1700* (Cambridge, 1992), pp. 151 - 77. Also, Jan W Wojcik, 'Robert Boyle and the Limits of Reason: A Study of the Relation Between Science and Religion in Seventeenth-Century England', PhD thesis (Kentucky, 1992) and *idem.*, 'Theological Context of Boyle's *Things above Reason*', in Michael Hunter, ed., *Boyle Reconsidered* (Cambridge, 1994), 139 - 51.

¹²⁷ Boyle consulted three lawyers prior to his refusal to act as president of the Royal Society on the grounds of concern over oath-taking - Rotherham may have been consulted, although no evidence exists to corroborate this claim. Boyle's concern with exactitude was characteristic of all his endeavours - experimental, legal, and pious.

Chapter Four

Richard Bentley: The Use of Natural Philosophy in Pulpit Oratory.

4. 1. Bentley's Early Career

Richard Bentley occupies a significant position both in the historiography of the Boyle Lectureship and in more general studies of the relationship between science and religion. His two final Sermons, given in the first year of the lectureship, are generally considered, by historians of science, to be exemplary sites for studying Newtonian apologetics. Moreover, Bentley has been deemed the paradigm lecturer who established the general tenor of the Boyle lectureship. I provide an alternative account, which seeks to establish independence for Bentley's performance from the context of a Newtonian based apologetics. Furthermore, Bentley's Sermons were not typical of subsequent performances, but conformed to traditional Christian scholarship, responding to threats from alternative systematic philosophical and theological claims. The difference between Bentley's performance and the writings of others (for example, More, Cudworth or Stillingfleet) in the genre lay in the occasion and not in the strategies: Bentley's extensive use of secular learning - and particularly natural philosophy - took place within a sermon. Although he drew on acquired stocks of scholarly expertise the distinctive application of natural philosophy from the pulpit underscores the importance of the occasion. Thus, an awareness of shifting polemical demands and the function of the lectureship as an expedient response, focuses interpretation on the specific nature of his performance. My approach, therefore, treats Bentley's performance as a combination of the demands of office (preacher) and the contingencies of personal location within scholarly networks. His Boyle Sermons added further impetus to his growing scholarly credit and to his rising status within the institutional hierarchy and the Republic of Letters.¹

¹ Evelyn implied that Bentley's reputation was already established prior to his delivery of the Boyle Sermons, when he remarked, 'I did never believe Dr. Bentley needed the Boylean lecture for want of other business, or to give him reputation'. See, Evelyn to Bentley, January 20 1697, in Christopher

This chapter is divided into four sections. The remainder of this first section contains a brief summary of salient events in Bentley's career up to and including the period of his performance of the Boyle Sermons in 1692 - 3. Section two offers an explanation of the Trustees' choice of Bentley. The third section provides an analysis of Bentley's overall programme, plus a detailed analysis of selected themes from the first six Sermons. It is significant, given the standard Newtonian emphasis, that these Sermons have been largely ignored by historians presumably because they contain no Newtonian material - which only appears in the two final Sermons. In the fourth section I will examine the relationship between Bentley and Newton in the light of these discussions, and analyse the three final Sermons and the Bentley-Newton correspondence.

Richard Bentley was born on the 27 January 1662 in the parish of Rothwell, near Wakefield in West Yorkshire. The family, according to Monk, 'were of that respectable class which has supplied every profession with many of its brightest ornaments, the higher description of English yeomen'.² Originally settled at Heptonstall, a small village some eight miles from Halifax, the family estate was confiscated in the Civil War when Richard's grandfather James Bentley, a captain in the Royalist army, was taken prisoner and died in Pontefract Castle. Richard's father, Thomas Bentley, subsequently held a small estate at Woodlesford in the parish of Rothwell, and Monk concludes that this had been the original residence of the family. In 1661 Thomas married Sarah (his second marriage), the daughter of Richard Willie a mason at Oulton.³

Wordsworth. *The Correspondence of Richard Bentley D. D. Master of Trinity College* (2 vols., Cambridge, 1848), i, p. 136.

² James Henry Monk. *The Life of Richard Bentley, D. D. Master of Trinity College, and Regius Professor of Divinity in the University of Cambridge: With an Account of His Writings, and Anecdotes of Many Distinguished Characters During the Period in Which He Flourished* (2 vols., London, 1833), i, p. 2. Monk makes great use (whilst correcting its errors) of the article in the second edition of *Biographica Britannica*, said to have been the work of Richard Cumberland, Bentley's grandson.

³ R. C. Jebb. *Bentley* (London, 1992), p. 2. Jebb describes Willie as more a 'builder' and in 'pretty good circumstances' as he was a major in the Royalist army. Bentley's future enemies in the 'Phalaris' controversy would make great use of his relatively lowly origins. Cumberland exaggerated Bentley's social standing. However, Bentley himself appears not to have commented on the subject. On the Phalaris controversy see Monk, *op. cit.*, pp. 78 ff.; Joseph M. Levine, *The Battle of the Books: History and Literature in the Augustan Age* (Cornell, 1991); Richard Mckeeon, 'The Battle of the Books', in Wayne C. Booth ed., *The Knowledge Most Worth Having* (Chicago, 1967), pp. 173 - 202; John F. Tinkler, 'The Splitting of Humanism: Bentley, Swift, and the English Battle of the Books', *J. Hist. Ideas*, 49 (1988), 453 - 72.

Interestingly it was his mother who introduced Bentley to what Monk quaintly calls the 'Latin Accidence'.⁴ He subsequently attended a day school in neighbouring Methley and progressed to the Wakefield Grammar School, 'a seminary of considerable reputation'.⁵ As his father died when Bentley was only thirteen he was put into the care of his maternal grandfather, who sent Richard to university in 1676. Richard was not the main beneficiary of his father's estate, which went to the eldest son of the previous marriage. Bentley's adventitious aptitude for study ensured that the decision to send him to Cambridge was not merely the result of younger sons being traditionally sent to university.⁶ He was admitted subsizar of St. John's College, under the tuition of Joseph Johnston: the master of the college was Francis Turner who was subsequently translated to the Bishopric of Ely.⁷

Little is known of Bentley's studies at the university and we can only assume that he pursued the standard curriculum which consisted mainly of Logic, Ethics, Natural Philosophy and Mathematics.⁸ Bentley graduated in 1680 and was registered sixth in the first class. This was a nominal position as the first three places were as Jebb says, 'men of straw' nominated by the vice-chancellor and the two Proctors.⁹ In real terms Bentley achieved the equivalent position of third Wrangler: this degree of attainment could not have failed to arouse patronage interest. He did not, however, receive a fellowship. As a Yorkshireman he had been the beneficiary of a Constable scholarship during his undergraduate years. On this occasion his county of origin excluded him from the two fellowships awarded to Yorkshiremen at St. John's: the statutes of St. John's limited to two the number of fellows born in each county and

⁴ Monk, *op. cit.*, p. 3.

⁵ Monk, *ibid.*, p. 3.

⁶ Jebb refers to the 'common error' which assumes that this was the usual age for entrants to the university. In the latter part of the century the age of entry was already seventeen or eighteen. William Wotton, who was to become the friend both of Bentley and Evelyn, entered St. Catherine's when he was, as the records show, 'infra decem annos'. Wotton was made Bachelor of Arts at age fourteen but this was exceptional and so was Bentley's admission to the university at age fourteen.

⁷ Jebb, *op. cit.*, p. 4, suggests that the choice of University may have been due to the fact that the headmaster at Wakefield was a former member of Emmanuel College and the choice of St. John's due to the availability of scholarships for Yorkshire boys courtesy of Sir Marmaduke Constable. Joseph Johnston was a fellow of St. John's between 1669 - 86, see *Alum. Cant.*, ii, p. 479.

⁸ Monk is perhaps over-enthusiastic regarding the influence of Newton - Lucasian Professor at the time - on the young Bentley.

⁹ *Ibid.*, p. 5.

these were already held.

For the next two years there is no information available on Bentley's activities. Monk suggests that he continued to reside at Cambridge to pursue his studies. He was a candidate for a Constable fellowship in 1682 but all recipients had to be in holy orders. As he was too young (by four years) for entry into the priesthood, he was therefore ineligible. However, in the same year he was offered the head-mastership of the Spalding Grammar School in Lincolnshire, the nomination for this position being in the gift of St. John's. This, I suggest, was the result of his academic achievements: it is unlikely, in view of his background, that he would have obtained the requisite patronage in any other way. Monk makes a passing reference to the importance of scholarship

The commission of so important a trust to a youth who had just completed his twentieth year, is not only a testimony of his scholarship, but implies an opinion of the steadiness and discretion of his character.¹⁰

Bentley remained in this position for only one year before proceeding to the position of domestic tutor to the son of the renowned divine and scholar Edward Stillingfleet. At this time (1683) Stillingfleet was Dean of St. Paul's and had acquired a reputation as one of the leading defenders of the Anglican Church, particularly against Roman Catholics. There is no doubt that Bentley's interests were well served by this appointment to which he had been nominated by his patrons at St. John's, Stillingfleet having once been a fellow of that college. The appointment as tutor in the Stillingfleet household after all was not a more prestigious placement, considering the lowly status of tutors, and Monk probably exaggerates the contacts with London society to which Bentley would have been exposed.¹¹ However, the importance of Stillingfleet, both for Bentley's future career and the substance of his Boyle Sermons, cannot be overstated.¹²

¹⁰ Monk, *op. cit.*, p. 12.

¹¹ On the often servile position of tutors and chaplains in households such as Stillingfleet's see, George C. Braur, Jr., *The Education of a Gentleman; Theories of Gentlemanly Education in England, 1660 - 1775* (New York, 1959), esp. pp. 214 - 18. Also, Nicholas Hans, *New Trends in Education in the Eighteenth Century* (London, 1951), esp. Ch. ix, 'Home and Private Tutors', pp. 181 - 93.

¹² Sarah Hutton has drawn attention to the remarkable similarity between the contents of Bentley's Sermons, and materials for Stillingfleet's projected second version of his 1662 *Origines Sacrae*. The later version was written in the mid 1690s but was left uncompleted at Stillingfleet's death in 1699. It was posthumously published as, *Origines Sacrae: or, A Rational Account of the Grounds of Natural and Revealed Religion: Wherein The Foundations of Religion, and the Authority of the*

Bentley's position, given Stillingfleet's credibility, would certainly have launched a budding scholar into the world of Anglican learning. Moreover Bentley gained access to one of the best private libraries in the kingdom and the personal association of Stillingfleet, who had held similar positions in the houses of gentlemen at the start of his own career. In Stillingfleet's library Bentley began his professional study of theology and of oriental languages which were considered essential tools in its serious study. He also pursued the work which would occupy much of his professional scholarly life - the investigation of classical authors. Although Bentley had probably intended to pursue a clerical career he did not take orders at the usual age of twenty-four. This should have occurred in 1686, two years after entering the Stillingfleet household. In that year James II acceded to the throne and Monk claims the delay was due to the overt Roman Catholic policies pursued by James. Stillingfleet's role as Prolocutor of the Lower House of Convocation brought him into conflict with James and his engagement in protracted controversies with Roman Catholics kept Bentley busy as Stillingfleet's amanuensis. Thus his involvement in these polemical conflicts may have delayed his ordination.¹³ He was ordained deacon in 1690, after James had taken flight, and also made chaplain to Stillingfleet who had meanwhile been translated to the See of Worcester.¹⁴ His ordination into the priesthood only occurred during the first year of his Boyle lectures - he may have considered this the optimum time, in terms of possible further preferment - and he was also made prebendary of Worcester Cathedral.

To demonstrate the enormous energy and enthusiasm expended by the young Bentley on scholarly pursuits, Monk cites the subsequent remarks of Bentley regarding his method of learning Hebrew. Before the age of twenty-four Bentley had written a

sort of *Hexapla*; a thick volume in quarto, in the first column of which he inserted every word of the Hebrew Bible alphabetically: and in five other columns, all the various interpretations of those words in the Chaldee, Syriac, Vulgate, Septuagint, and Aquila, Symmachus, and Theodotian, that

Scriptures, are Asserted and Clear'd. With An Answer to the Modern Deists (London, 1709). Hutton argues for the significant role of Stillingfleet in providing the materials for Bentley's Sermons. See, Sarah Hutton, 'Science, Philosophy, and Atheism: Edward Stillingfleet's Defence of Religion' in, Richard H. Popkin and Arjo Vanderjagt eds., *Scepticism and Irreligion in the Seventeenth and Eighteenth Centuries* (Leiden/New York/Koln, 1993), pp. 102 - 20.

¹³ Monk, *op. cit.* pp. 16-17.

¹⁴ R. J. White, *Dr. Bentley: A Study in Academic Scarlet* (London, 1965), p. 54.

occur in the whole Bible. This he made for his own use, to know the Hebrew, not from the late rabbins, but from the ancient versions; when, bating Arabic, Persic, and Ethiopic, he read over the whole Polyglot.¹⁵

It seems to be a characteristic of scholars who pursued classical and philological studies in this period to consider no task beyond them. Given the necessary manuscripts, sufficient time, and an intense attention to detail, antiquities, philology, astronomy, chronology, or any pursuit (involving a microscopic focus) could be undertaken with great proficiency.¹⁶ Considering Bentley's self-perception, the scholarly community in which he came to maturity, and his subsequent international reputation, the historian must pay full attention to the credit and the status which such scholarly pursuits engendered amongst his peers in this polymathic network.¹⁷ Bentley's early training under the patronage and tutelage of Stillingfleet provided him with the reservoir of knowledge which he would later display in the Boyle Sermons.

Bentley remained resident in the Stillingfleet household until 1689 when he accompanied his pupil James Stillingfleet to Wadham College Oxford. As Bentley had already proceeded MA at Cambridge he was incorporated, during that year, with an Oxford MA and membership of the college.¹⁸ Now resident at Oxford he had the opportunity to familiarise himself with the riches of the Bodleian Library, both

¹⁵ See Monk, *op. cit.*, p. 14. Monk is quoting *Dr. Bentley's Proposals for Printing a New Edition of the Greek Testament, and St. Hierom's Latin Version: with a full answer to all the Remarks of a late pamphleteer . . .* (London, 1721), p. 35. Monk also refers to another volume, in which Bentley recalled how he wrote the various lections and emendations of the Hebrew Text drawn out of the ancient versions, in order to make a second part to Capellus's *Critica Sacra*.

¹⁶ The relationship between contemporary computational subjects - astronomy, geometry, chronology, the antiquarian-historical disciplines - is especially important for the historian of science. See Anthony Grafton, *Defenders of the Text: The Traditions of Scholarship in an Age of Science, 1450 - 1800* (Cambridge, Mass./London, 1991), Chapter Seven, 'Humanism and Science in Rudolphine Prague: Kepler in Context', pp. 178 - 203. Grafton argues (p. 203) how 'in the most fashionable and attractive studies - like astronomy and chronology - scholarship and science were necessarily fused into a single pursuit not identifiable with any modern discipline'.

¹⁷ Isaac Barrow came to the study of mathematics and Euclid through his study of historical chronology - Newton, Whiston and Edward Bernard were typical of those who combined these studies. On Barrow's disciplinary move see, John Gascoigne, 'Barrow's Academic Milieu: Interregnum and Restoration Cambridge', in Mordechai Feingold ed., *Before Newton: The Life and Times of Isaac Barrow* (Cambridge, 1990), 250 - 90. On antiquities and history, see John Gascoigne, '“The Wisdom of the Egyptians” and the Secularisation of History in the Age of Newton.', in Gaukroger, *The Uses of Antiquity: The Scientific Revolution and The Classical Tradition* (Dordrecht/Boston/London, 1991), 171 - 212; Gary W. Trompf, 'On Newtonian History', in Gaukroger, *op. cit.*, 213 - 49. Frank Manuel also draws attention to this point, in *Isaac Newton, Historian* (Cambridge, 1963).

¹⁸ On Wadham College and its illustrious members, see Charles Edward Mallet, *A History of the University of Oxford* (2 vols., London, 1924), ii, pp. 260 - 67.

manuscript and printed. There were also opportunities for further patronage. Stillingfleet's name gained him connections with some of the most distinguished scholars of the day. The list is impressive: John Mill, Principal of St. Edmund's Hall; Edward Bernard, astronomer, antiquarian and chronologist; Humphrey Hody - Wadham's tutor and subsequent Professor of Greek, and William Lloyd, Bishop of St. Asaph, all took an active interest in Bentley's career.¹⁹

Evidence of Bentley's acceptance and growing reputation is provided by the decision by several Heads of Oxford colleges to appoint him to negotiate the purchase of the library of Dr. Isaac Voss (better known by his classical name of Vossius) the recently deceased Canon of Windsor.²⁰ The library had been the joint collection of Vossius and his father, Gerhard John Vossius, and was considered the best of its kind in private hands. Unfortunately for Bentley's reputation the deal fell through and the library eventually went to the University of Leyden. Although this incident was later exploited by Bentley's enemies, it indicates the trust leading Oxford academics placed in his judgement at a period when he had no effective institutional position. Three surviving letters between Bentley and Edward Bernard substantiate the former's standing in the eyes of the astronomer and classicist.²¹

With the encouragement of William Lloyd, Bentley undertook a daunting project to publish the Greek lexicographers. Although the project proved impossible, given the dissimilarity of the three principal lexicographers, Bentley discovered two main sources of corruption in the Lexicon of Hesychius which rendered it almost

¹⁹ On the relationship between Mill and Bentley see, Adam Fox, *John Mill and Richard Bentley: A Study of the Textual Criticism of the New Testament 1675-1729* (Oxford, 1954): On Edward Bernard and Humphrey Hody see, *DNB*: On Lloyd's encouragement of talented young scholars see, A Tindal Hart, *William Lloyd, 1627 - 1717: Bishop, Politician, Author and Prophet* (London, 1952), esp. pp. 231 - 32. The group of Anglican scholars associated with Stillingfleet's network included John Hale, Tillotson, Gilbert Burnet, and Tenison. On the very close friendship between Tenison and Lloyd, see Hart, *op. cit.*, pp. 178 ff. On Bentley and Bernard see their correspondence (undated) reprinted in volume two of J. H. Monk and C. J. Blomfield, eds., *Museum Criticum: or, Cambridge Classical Studies* (2 vols., Cambridge, 1826) The correspondence between Bentley and Bernard may also be found in, Wordsworth, *op. cit.*, i. Bentley on several occasions calls Bernard, 'Eruditissime et Amicissime Bernarde'.

²⁰ The phrase 'Heads of Oxford' is Monk's - he does not specify who was involved. See, *op. cit.*, pp. 21 ff. For an interesting and illuminating discussion of the importance of Vossius see, David S. Katz, 'Isaac Vossius and the English Biblical Critics' in, Popkin and Vanderjagt, eds., *op. cit.*, 142 - 84. On the importance of Vossius for Newton's chronology, see Trompf, *op. cit.*, p. 239, fn. 33.

²¹ See, Christopher Wordsworth, *op. cit.*, esp. pp. 8 ff., for Bentley's letters to Bernard regarding the complexity of these transactions.

useless.²² The first problem stemmed from the habit of scribes conflating together marginalia and main text and the second was the lack of alphabetisation. According to Monk Bentley was able to make more than five thousand corrections to Hesychius. More importantly while Bentley was engaged in these projects he was drawn to the subject which was soon to establish his European reputation. The occasion was the projected publication, by the Sheldonian Press, of a ninth-century manuscript by Johannes Malela Antiochenus. Monk describes it as one of the

numerous chronicles drawn up by Christian writers, of events from Adam to their own time: the real value of which consists in their being taken from older writings that have perished, and from their being the sources whence Suidas and other lexicographers drew their information upon chronology and history.²³

The project to publish Malela was under the supervision of John Mill. Bentley expressed his curiosity and was allowed access to the sheets before they went to the press on the condition that his comments be added as an appendix. Although Bentley claimed to have found the manuscript unspeakably dull he was pressured to continue with his commentary by Bishop Lloyd. As he was about to leave Oxford he took the necessary materials back to Stillingfleet's London residence. He put his comments into a letter to John Mill and it is this letter, published along with the edition of Malela as *Epistola ad Millium*, which established Bentley's reputation as a classical critic. As I will show in the next section the *Epistola* was much more than a dry commentary on the minutiae of textual correction and restoration of ancient poets and lexicographers.

At the time of the publication of Malela (1691) Bentley was twenty nine and in residence at Worcester with Stillingfleet. He now made the crucial decision to devote himself to the study of theology, as a more fitting task than classical scholarship for the chaplain of the learned Stillingfleet. He explained this to Bernard who urged him to combine the two and utilise his obvious critical talents in a theological capacity. It was probably not a very serious claim on Bentley's part that he would abandon classical studies for theology and soon after the letter from Bernard he began contemplating further editions of ancient authors. For our purposes the most important was his intention to prepare an edition of the astronomical poet

²² Monk. *op. cit.*, pp. 24 ff.

²³ *Ibid.*, p. 25.

Manilius. That contemporaries also considered this an important project is shown by the support of Bentley's associates. Sir Edward Sherburn, a cavalier in the civil war, had translated the first book of Manilius with a commentary and sent Bentley some rare editions and other materials.²⁴ Bernard lent him his own manuscript and wrote to Spanheim asking for Vossius's collation which had been sent to Leyden with the rest of the library.²⁵ The recognition which Bentley achieved from these scholarly activities added to his credibility and enhanced his prospects for further patronage. Thus in the period leading up to the Boyle Lectures Bentley was already an established figure within the European Republic of Letters.

The choice of Manilius (apart from his reputation as one of the most difficult of ancient authors) is highly significant: the astronomical poem of Manilius and Lucretius's poem are the only works of natural philosophy which reflect in Bentley's early interests.²⁶ Moreover, during this period he first applied either to John Craig or William Wooton for help in reading Newton's *Principia*.²⁷ But we should not view this request in the light of his later appointment as Boyle Lecturer. Instead Bentley probably required technical astronomical assistance with his projected Manilius. This request predates Boyle's death by a period of six months, and Bentley could not at

²⁴ R. J. White, *op. cit.*, esp. pp. 81 - 3. White typically remarks, 'Manilius was capable of apostrophising the deity in terms that delighted the disciple of Newton'. Edward Sherburn published the first book of Manilius's text, *The Sphere of Marcus Manilius made an English Poem: with Annotations and an Astronomical Appendix* (London, 1675). Thomas Creech, the Deist, published the complete text and used it as an introduction to the Stoics, *The Five Books of M. Manilius, Containing a System of Ancient Astronomy and Astrology: together with the Philosophy of the Stoicks . . .* (London, 1697). Bentley's edition was finally published in 1739, Monk, *op. cit.*, ii, p. 397.

²⁵ On 'exchange' and gifts within the scholarly international network, see Anne Goldgar, *Impolite Learning: Conduct and Community in the Republic of Letters 1680 - 1750* (New Haven/London, 1995), p. 29. For example, Bentley offered Newton a present of his published Boyle Sermons, see Turnbull, iii, p. 252. William Wooton presented Bentley with detailed transcriptions of the passages of Lucretius quoted by Macrobius. Thus Bentley was probably, as Monk says, 'meditating an edition of the Epicurean poet' long before his involvement in the Boyle Lectureship, where Epicureanism figures so prominently. See Monk, *op. cit.*, i, p. 20.

²⁶ Another 'astronomical poem' is mentioned in Bentley's comments on Paul's speech to the Athenians where he identified the 'poet', reputed (according to Paul) to have said, 'For we are also his [God's] offspring,' as '*Aratus the Cilician . . .* in whose Astronomical Poem this passage is now extant'. Letsome and Nicholl, *op. cit.*, i, p. 13.

²⁷ The response is contained in a letter, 24 June 1691, from John Craig to William Wooton, Turnbull, iii, pp. 150 - 51. See below for a discussion of this issue, and the subsequent 'Paper of Directions' which offered Bentley further help. The importance of Wooton as the intermediary between Craig and Bentley should not be overlooked. Moreover, the relationship between Bentley and Wooton should not be taken out of the classical and philological world in which it correctly belongs and in which the exchange of texts and information was a sign of membership of that world.

that time have known that he would be invited to deliver a series of Boyle Lectures. Although the edition of Manilius was not published at this stage, and indeed it was more than forty years before it went to the press, these scholarly activities and the credit which he was amassing in the scholarly world were to prove instrumental, one year later, in the choice of Bentley as the first Boyle Lecturer.

4. 2. The Choice of Bentley as First Boyle Lecturer.

To understand Bentley's role in the Lectureship, and the reasons why the Trustees chose him, we must continue to locate him in the world of classical scholarship of the late seventeenth century. Of crucial importance is the position he held under Stillingfleet. His patron - who used philology, chronology and a vast reservoir of ancient and modern learning in the service of Christian scholarship - would doubtless have guided the talents of his protégé along similar channels. The skills which Bentley possessed, his growing reputation and his scholarly credit satisfied an increasing institutional drive - in the period after the Restoration - for a learned Anglican priesthood.²⁸ This historiographical location must be the starting-point for an analysis of Bentley's role as first Lecturer and not any assumed connection with Newton and Newtonianism. When Bentley was chosen to inaugurate the Boyle Sermons he had already attained the status of a leading classical scholar and critic, achieved mainly through the publication of his *Epistola ad Millium*. The agenda of the Lectureship, as can easily be seen in its published Sermons, does not support a search for Newtonian lecturers on the part of the Trustees, Bentley's interest in the *Principia* has an alternative explanation. Furthermore, as I will subsequently show, the presence of Newtonian material in Bentley's sermons can be explained on the basis of Bentley's rhetorical use of natural philosophy.

Anthony Grafton makes the following important claim about the letter to Mill:

No philological masterpiece occupies a grander niche in the canon than Richard Bentley's *Epistola ad Millium* of 1691. . . . Despite the obscurity of its occasion and the difficulty of its contents, the *Epistola* made Bentley a European celebrity. It showed that he had surveyed in magisterial detail those favourite quarries for the Hellenists of his day, the Byzantine

²⁸ See Irène Simon, *Three Restoration Divines: Barrow, South, Tillotson* (2 vols., Paris, 1967 & 1976), i. esp. Chapter One. 'The Reform of Pulpit Oratory in the Seventeenth Century', pp. 1 - 73..

lexicographers and scholiasts...More strikingly, it revealed that he now understood the meters of Greek poetry more thoroughly than any other modern scholar - including Scaliger and Grotius, whose errors he corrected with characteristic self-confidence.²⁹

As well as the very fine technical observations and solutions provided by the *Epistola*, Grafton discusses Bentley's larger programmatic intentions which included setting out to discredit the 'whole armoury of dubiously ancient texts with which Christian scholars had tried to show that the best of the Greeks agreed with them'. Grafton suggests, that one reason why Bentley expended so much energy on this text, resulted from the urgency which had been generated in the Restoration Church over the orthodox position regarding ancient learning. The Cambridge Platonists, for example, had over-emphasised the similarities between classical and Christian notions of monotheism.³⁰ They had provided texts such as the Hermetic Corpus and the Sibylline oracles with Christian credentials. This of course was useful and supportive in the construction of a universal history which reduced all events to one continuous narrative determined by the Christian dispensation. These 'mystical' texts were also of enormous apologetic use in the war against the materialists as they could be shown to demonstrate the universal acceptance of an immaterial spirit. However, scholars such as Stillingfleet perceived that the Platonists might be playing into the hands of their enemies by offering them an excuse for 'relativising' all systems. This interpretation of the programme of Bentley and Stillingfleet creates problems for the suggestion by modern scholars that there is a continuous tradition of liberal Anglicanism from the Great Tew group, through the Cambridge Platonists on to Stillingfleet and the Boyle Lecturers. The construction of this historical lineage, by historians of Anglicanism, requires a little rethinking in the light of what these technical arguments reveal.³¹ It also highlights how the use of the ancients by

²⁹ Grafton, *op. cit.*, p. 13.

³⁰ Cudworth, *The True Intellectual System: wherein all the Reason and Philosophy of Atheism is Confuted, and its Impossibility Demonstrated* . . . Translated by John Harrison (3 vols., London, 1845). Bk. i. Ch iv. not only attributes monotheism to the Greeks but also a notion of the divine trinity. Thus, although much of Bentley's substantive material can be found in Cudworth the castigation of the use of the ancients in this manner separates him from the Platonists. John Harris castigated those who abandoned the notion of a providence in favour of pagan terms such as, 'necessary and blind Cause of Things, Nature, the Soul of the World, or some such Word, which they have happened to meet with in the ancient heathen Writers'. Letsome and Nicholl, *op. cit.*, i, p. 358. The Platonists were treading on thin ice when they populated the cosmos with powers and angelic dignitaries. See Grafton, *op. cit.*, p. 19.

³¹ See Susan Rosa, 'Religion in the English Enlightenment: A Review Essay', *Eighteenth Century*

Anglican divines was subject to context. Moreover, a clear distinction was drawn between the legitimate authority of the ancients in astronomy or chronology, and their illicit use in matters of doctrine, where the Christian dispensation had proprietorial control over doctrinal materials.

For example, Stillingfleet attacked the Platonists in his *Origines Sacrae*. They were in turn defended by Cudworth in his magisterial *True Intellectual System of the Universe* which was then criticised by Bentley in the *Epistola*. However, Henry More, an obviously genuine Christian, attempted to conflate all historical testaments. Stillingfleet and Bentley criticised More for providing the enemies of Christianity with an argument to undermine the singularity of the Christian dispensation. This road had already been taken by the deists who attacked the uniqueness of Christ and thus his divine status, and the divine status of miracles. In response More and Cudworth turned to the ancient classical sources to demonstrate, against the materialists, the universality of spirit in all times and ages and to show that pagan learning foreshadowed the doctrines of Christianity. More, for example, quite openly claimed

Though the conceptions in the Cabbala be most of what my own, yett I do what I can in my Defense to gette Godfathers all along to these births of my own braine, and so lessen the odium of these inventions by alledgeing the Authority of Auncient Philosophers and Fathers.³²

This offered the deists an opportunity to relativise Christianity and claim that not only paganism but the *true* monotheistic religions, Islam and Judaism, contained all the essentials for the belief in a deity and were sufficient for the practice of a virtuous life. All else was the imposture of self-aggrandising priests. In the light of these intranicene polemics on the propriety of pagan sources, classical learning had to be re-appropriated by Christians, or at least shown to belong by an inherited right to orthodoxy. This was the age-old tactic of illustrating how even the poison of heresy could, by a divine providence, in the hands of righteousness prove useful in the defence of orthodoxy.

Studies, 28 (1994), 145 - 9.

³² See, Henry More to Anne Conway, August 9 1653, in *The Conway Letters* (revised edition, 1992), p. 83. More believed that the literal interpretation of Genesis given in standard exegetical texts had 'further'd Atheisme in the world' and made Scripture the object of ridicule and a mere fable. In his *Conjectura Cabbalistica* he argued for a 'literal Cabbala' a 'moral Cabbala' and a 'philosophical Cabbala' - see *Ibid.*, p. 82.

This act of appropriation was continued by Bentley and determined the form and the choice of materials in his Boyle Sermons. The presence of natural philosophy in Bentley's Sermons was the result of a widespread programme of appropriation, by certain Anglican divines, of natural philosophy - especially ancient atomism. In the polemics over ancient sources the growing status of contemporary natural philosophy's methods and achievements provided Bentley with recognisably authoritative materials. The conflation of ancient materialist philosophies - and their dangerous doctrinal consequences - with modern materialism necessitated alternative resources. True science could be used as the pre-eminently successful discourse in exploding the false science of a materialist ontology. Whilst Bentley retained the ancients as useful and reliable sources, their evident absurdities, as in the cases of Epicureanism and Aristotelianism (revamped by modern atheists) could now be exposed by the light of contemporary natural philosophy. It is also interesting to note that Bentley brought the 'modern' tools of scholarship to bear on his analysis of ancient texts. This scientific investigation of traditionally authoritative materials served to weaken their status even further.³³

So stunning was Bentley's performance in the *Epistola* that further preferment was assured. He had shown himself to be useful, since he could effectively combine technical criticism in the service of the uniqueness of the Christian dispensation and an agonistic defence of orthodoxy. These qualities determined his selection as the first Boyle preacher. Grafton makes the following observation.

Short-term ecclesiastical controversies thus did much to define the tone and direction of Bentley's work, which became in part a bid for further patronage - a move in the game of clerical politics as well as in that of historical theology. The personal and the professional, prejudice and philology, learned tradition and iconoclastic innovation are inextricably interwoven in the fabric of Bentley's little book.³⁴

In the Boyle Sermons, Bentley continued his programme of appropriating classical authorities for safe theological purposes, and showing that the claims of

³³ As we shall see, in Chapter Five below, the debate was often complicated by a paradoxical combination of ancient and modern thought. In his Boyle Sermons, John Harris contrasted the proper use of ancient material, by moderns such as Descartes and Locke, with the atheist's *misuse* of the ancients.

³⁴ *Op. cit.*, p. 20.

materialism are philosophically absurd without the addition of an organising spiritual power. Moreover, the modern tools of classical scholarship in alliance with the best of contemporary natural philosophy deprived deists of ancient texts as an unquestioned resource. He was a perfect choice considering the list of enemies in Boyle's brief. He was also patronised by Stillingfleet and the cream of Hellenist, antiquarian and philological scholarship, such as Mill, Lloyd and Bernard. He conformed admirably to Tenison's criteria for the establishment of a learned priesthood. Moreover, he would most certainly have been approved by Evelyn who understood that classical scholarship be used in the service of Christian piety.

4. 3. An Analysis of Bentley's Boyle Sermons.

4. 3. 1. Overview: Bentley's *Use* of Natural Philosophy.

Bentley's Sermons provide a precise locus for observing the interactions of science and religion. Fortunately for the historian of science, Bentley attacked the arguments of ancient and contemporary materialism by tactically deploying contemporary natural philosophy. Whilst engaged in confuting the atheist - listed first in Boyle's opponents of the church - Bentley treated his audience to his extensive familiarity with seventeenth-century science. However, by concentrating on Newtonianism at the expense of other scientific material, previous commentators have ignored the bulk of Bentley's sermons. There are no published analyses of the overall structure of his Sermons.³⁵ This project requires an examination of the content of the lectures, while paying attention to their specific oratorical requirements. This investigation is premised on the following interpretative principle: the presence of scientific material, in Bentley's sermons, can be explained in terms of its theological *use*. Furthermore, by ascertaining the use of *all* the natural philosophy in the Sermons the historian of science is better equipped to explain the presence of Newtonian material. It is also important to recognise that Bentley was performing as a scholar, for scholars, and that he was prepared to use whatever was useful in achieving victory against his theological enemies.

Before proceeding to discuss the Trustees' choice of Bentley I wish to draw

³⁵ See David C. Kubrin, 'Providence and the Mechanical Philosophy: the Creation and Dissolution of the World in Newtonian Thought', PhD thesis, (Cornell University, 1968), esp. pp. 219 ff. Kubrin comments on the importance of Bentley's Sermons, but then proceeds to examine only those which form a link with Newton's philosophy and in particular Newton's 'cosmogony'.

attention to the following distinction between the material on which Bentley built his reputation and the materials which form the substance of his Sermons. The latter was most likely not drawn solely from Bentley's personal stock of learned material. As a young and inexperienced preacher he would have followed the traditional strategies for dealing with specific opponents. Thus, the Sermons were not an autonomous and freely chosen scholarly venture: they were an ecclesiastical appointment. The works of Stillingfleet and the learned tradition of Anglican scholarship provided much of his content. However, what is particularly noticeable in Bentley's Sermons is the status conferred on natural philosophy: this could not have taken place unless sanctioned by Bentley's patrons. Furthermore, this sanction was given by Anglicans who were not practitioners of natural philosophy. However, these high-ranking divines had discerned its *use* as a theological adjunct.

The use of natural philosophy to respond to scientific materialism implicated Bentley in the use of suspect knowledge for theological purposes.³⁶ His deployment of atomism, which was also the classical site of materialism, continued the tradition of earlier divines who sought to wrest this desirable ontology from the hands of the irreligious. If successful, the tactical appropriation, of a discourse which also provided armaments to one's enemies, gave the strategy added force. On the other hand strict vigilance was necessary when purveying a secular philosophy in the service of religion. Notwithstanding this caution he obviously had the support of his patrons, particularly Stillingfleet and Tenison, in continuing the strategy of appropriation. Further sanction was provided for the project by the fact that the Lectureship owed its existence to Robert Boyle, a virtuous Anglican who had spent a lifetime combining the practice of Christian piety whilst pursuing secular knowledge.³⁷

Bentley's reliance on science serves as an indication of its growing

³⁶ The question of exactly how suspect scientific discourse was in this period is still an open one. An analysis of this issue is outside the scope of this thesis. However I think it is perhaps safest to chart a course between the Scylla of Lecky, Draper and White, and the Charybdis of those who reduce the encounter of churchmen with natural philosophy to an isolated 'fusillade', and a 'little sniping'. For the latter assessment see, Michael R. G. Spiller, "*Concerning Natural Experimental Philosophie*": *Meric Casaubon and the Royal Society* (The Hague/Boston/London, 1980), p. 14.

³⁷ Tenison was obviously interested and supportive of the new philosophy and the Royal Society, see above, chapter three. As mentioned above, Stillingfleet, at the time of Bentley's Boyle Sermons, was busily engaged in rewriting his *Origines Sacrae* in which large quantities of natural philosophy appeared. See Sarah Hutton *op. cit.*, (*passim*).

respectability in theological discourse. His extensive use of science was all the more significant as in certain cases it proved disastrous. For example the support, and eventual abandonment, of Descartes' system by Henry More illustrates the growing awareness of the dangers of a premature enthusiasm for natural philosophy on the part of the pious Anglican. The materialist threat, arising from the use of Descartes' philosophy, was still present in 1692, the year of Bentley's Boyle Lectures. The use of ancient atomism in Bentley's sermons was specifically aimed at exploding the Cartesian concept of matter-as-extension. Paradoxically, Bentley's concept of matter - dead and inert atoms - offered more to the materialist than Descartes' rather abstract notion of extension. As a rhetorical strategy it was necessary to denigrate matter, since the Cartesian image of matter was more easily identified with the source of all things. The denigration of matter as insignificant, inactive, brute and stupid, was a necessary prelude to achieving his theological goal of the non-eternity of the material world, the absolute passivity of its component particles, and complete dependence of all activity on God. He also sought to remove Cartesian notions of indefinite extension, which carried implications of eternity, necessity and self-sufficiency. Instead, he deployed atomism to demonstrate the complete dependence of all forms, motions, activities, and powers on God. This was Bentley's chief objective in the Sermons to convey this image of matter to his audience.

As Bentley pointed out, the divine gift of natural philosophy and its pious use in the hands of the righteous was itself a providential act. Thus by the 1690s high-ranking members of the Anglican Church were willing to sanction the wholesale use of natural philosophy when strategically applied to theological ends.³⁸ Whilst science and its general status as an authoritative body of knowledge was admitted by these clerics into the arsenal of defensive weaponry, the association of suspect forms of knowledge with irreligion marked ever-present doctrinal dangers. Bentley's programme assisted in defusing those threats, abated the anxieties of pious minds and provided a demonstration of the providentially ordained use of potentially dangerous

³⁸ This move constituted a restoration, or reformation, of natural philosophy as an adjunct - or, handmaiden (*ancilla*) - of theology: it is all the more striking as these clerics were not practitioners of natural philosophy. Their support must not, therefore, be conflated with the active involvement in its practice by Anglicans such as Boyle or Evelyn. The fact that Bentley was so easily passed over for the second year of the lectureship might be the result of tentativeness and caution - on the part of the Trustees - toward the use of natural philosophy. The isolated appearances of natural philosophy in the Sermons might also serve as an index for this caution.

knowledge.

In studying the context of the Sermons we must also consider their oratorical nature. Bentley would have been familiar with the elements of rhetoric and also with the main duties of the preacher - to teach, to move and to delight. An understanding of his rhetoric enables us to appreciate the overall structure of Bentley's eight Sermons, the various rhetorical devices by means of which experimental knowledge was presented to the imagination (for example, the use of highly visual imagery); the representation of his own performance within the authoritative tradition of St. Paul's confrontation with vain philosophy; even his utilisation of such standard devices as wit, ridicule, irony, and the extensive application of the *reductio* argument. The Sermons were conducted as public disputations where victory was their primary objective. They were not exhortatory (where the primary aim was towards a recognition of the need for immediate moral correction) but were much more concerned with scholarly spectacle and learned display. His clerical audience would undoubtedly have paid attention not only to his substantive arguments but also to his method of deployment.

Bentley's first sermon carried the title 'The Folly of Atheism, and (what is now called) Deism: Even with respect to the present Life'. It was preached in St. Martin-in-the-Fields on March 7 1692. The text was Psalm 14. 1, *The Fool hath said in his Heart, There is no God; they are corrupt, they have done abominable Works, there is none that doth Good.*³⁹ The 'Confutation' of atheism occupied a great deal of Restoration literary talent and it is important to emphasise that the topic was not chosen by Bentley, even though he chose the means of attack.⁴⁰ It was the subject

³⁹ This was the title of the first edition of the first sermon. For an account of the various editions see. A. T. Bartholomew, *Richard Bentley, D. D.: A Bibliography of his works and of all the Literature called forth by his acts or Writings. With an Introduction and Chronological Table by J. H. Clarke* (Cambridge, 1908). John Harris's exegesis on the Hebrew word *nabal* (fool) illustrates the importance of the term 'fool' and its relation to the purpose of a *confutation*. See Letsome and Nicholl, *op. cit.*, i, p. 387. Harris defined the term as, 'such a one as is a *Fool* by his own Fault; one stupefied and dulled by vice and Lust, as he [the Psalmist] explains it afterwards; *one that is corrupt and become filthy, and that hath done abominable works.*' The venue for Bentley's sermons altered between St. Martin-in-the-Fields and St. Mary-le-Bow.

⁴⁰ That 'atomism', in its original pre-Democritean form, was the 'greatest bulwark and defence' against atheism was one of the central themes of Cudworth's *True Intellectual System* - a view also held by Glanvill and other members of the Royal Society. However, the style and language of Bentley is strikingly different from that of Cudworth and the rest of the Cambridge Platonists. Moreover, Bentley's arguments were delivered from the pulpit, they were not presented in a systematic treatise.

that chose the preacher not the other way round. However, the form and content would have been a matter of the preacher's personal skills and the reservoir of sources which he had acquired in his scholarly training. The decision to concentrate on 'atheists' rather than one of the other listed targets was probably at the suggestion of Tenison, who had already undertaken a critique of Hobbes and had recently delivered a sermon attacking atheism.⁴¹ Tenison, along with a host of other divines, considered Hobbes a worthy opponent and an exceedingly dangerous threat. However, it was not Hobbes's *social* doctrines, which recognised the fallen state of man, that demanded confutation but his materialism which threatened many of the fundamental doctrines of Christianity. Yet Descartes assumed a much higher profile in Bentley's sermons than either Hobbes or Spinoza, and it is evident that Bentley saw in Descartes' natural philosophy the main threat from materialism.⁴² Bentley's programme could be described as a demonstration of the ridiculous nature of Cartesian materialism. The sermons offered the opportunity for a public refutation of threats based on naturalistic explanations and an opportunity for branding the supporters of such systems as fools and idiots.⁴³ The style of Bentley's performance, and the fact that it was delivered in philosophical language, clearly indicates that the Sermons were not the response to the recent Revolution Settlement, as the Jacob thesis claims, but the continuation of a much earlier genre of challenging materialism.⁴⁴ Therefore it is essential to appreciate what is traditional in Bentley's Sermons and what is unique.

Bentley delivered his Sermons at a time when support for atomism was being

⁴¹ Several leading Anglicans had recently attacked atheism and in particular Epicurean materialism: Stillingfleet, Bentley's chief patron, had presented in his *Origines Sacrae* paradigmatic arguments against Epicureanism: he had also recently delivered a sermon against atheism. In a letter to Bernard, Bentley asserted that 'atheism' was the most important category in Boyle's list - evidenced by the fact that Boyle had placed it at the head. Bentley returned to the subject, in 1713, in his reply to Anthony Collins' *Discourse of Free-Thinking* (1713).

⁴² Descartes had a higher profile than Hobbes in the natural philosophy community. It was feared that atheists, when pushed to account for the origin and formation of organic and inorganic forms, might find 'natural' explanations in these systems. Ridiculing the *arguments* was therefore a preventative exercise: whilst ridiculing the *person* supplemented the exposure of folly.

⁴³ The ancient forms of Materialism, epitomised by Epicureanism, and skilfully expounded in Lucretius's epic *De rerum natura*, were conflated with modern materialist systems to demonstrate the foolishness of the latter for not progressing beyond the absurdities of the former.

⁴⁴ Bentley's performance is strictly the response of a scholar: it was only the demands of the pulpit which constrained the production of a learned treatise. However, his arguments - content and strategies - have been unjustifiably described as 'popular'.

strengthened by the labours of Christian natural philosophers, and naturalism which was also drawing its philosophical supports from the same ontology. Bentley's Sermons need to be interpreted as a battle over who had proprietorial right to this shared ontology. Whose ends would be served by its increasing authoritative status? In view of this agonistic conflict, I suggest that we emphasise Anglicanism's *use* of natural philosophy rather than its support *per se*.

The concept of *use* can be clarified by introducing two crucial notions which help to throw light on the overall structure of Bentley's eight Sermons - proof and evidence. Christians are entitled to draw both proof and evidence from three authorities - Revelation, Nature, and Reason. Bentley proceeded on the assumption that atheism - by its very nature - would reject Revelation as a source of evidence. Thus Scripture could not be a mutually acceptable source of truth.⁴⁵ However, Bentley explained how the atheist's arguments must be brought before the bar of 'proper Evidence' that would be acceptable to both the atheist and the Christian:

the mighty Volumes of visible Nature, and the everlasting Tables of right Reason; wherein, if they do not wilfully shut their Eyes, they may read their own Folly written by the Finger of God, in a much plainer and more terrible Sentence, than Belshazzar's was by the Hand upon the Wall.⁴⁶

By the 1690s Anglican theology was placing more emphasis on the faculty of Reason. But this was not an alternative to Revelation. It was generally considered that although reason was adequate in its determination of some truths, there were also truths which were beyond its capacity to access. However, since Bentley was not dealing with theological mystery, but with matters which reason and nature could access, failure to accept either of these domains would automatically exclude disputants from any reasonable argumentation. The willingness with which Bentley relinquished the authority of Revelation, must be seen in the context of the traditional view that atheism is the result of foolishness and corruption. Revelation pronounced the atheist to be corrupt both in the will and in the understanding: the purpose of the Sermons was, therefore, to demonstrate that nature and reason, those indisputable and mutually acceptable authorities, joined in the confutation. The charges were presented in the first Sermon along with the proofs of the atheist's folly. The folly of

⁴⁵ As it happens Bentley does not adhere to this relaxed attitude and many of the Sermons only work strategically when launched from a Scriptural base.

⁴⁶ Letsome and Nicholl, *op. cit.*, i, p.1.

the atheist lay in his rejection of the reasonable terms of the contract between him and God. Atheism attempted to support this rejection by resorting to naturalistic explanations drawn from the twin sites of reason and nature. Bentley's programme was to claim proprietorial rights to these sites on behalf of Christianity. The Sermons therefore dealt with the evidence for the prosecution, fundamental to all legal proceedings. The array of proofs and the systematic presentation of evidence were not deployed to convince the atheist of his error, but to reassure the audience - particularly the waverer - that the materialist's abuse of nature and reason was a consequence of atheism. Thus Bentley's use of natural philosophy was part of an evidential process. Its main aim was to convict the atheist.⁴⁷

The Sermons' discursive power was aimed at exposing the abuse of evidence drawn from natural authorities. The strength of such evidence was particularly a threat to weak Christians, who were easily convinced by a display of physical and natural explanations. It was, Bentley wrote, 'as Solomon Adviseth', to 'answer these *Fools not according to their Folly, lest we also be like unto them*', but because it was necessary and 'expedient that we put to Silence the Ignorance of these foolish Men, that Believers may be the more confirmed and more resolute in the Faith'. Bentley's argument also coheres with Boyle's intention in founding the Lectureship: to prevent the spurious reasons for atheism from persuading believers who are not so resolute in the faith. The public defence of doctrines guided the form and structure of the sermons. Bentley saw his pastoral and ministerial duty as providing a public defence of the superiority of Christian scholarship over all contenders. Specifically, it was Bentley's duty to make sure that matter and motion could never be demonstrated to be self-sufficient: his task was to find a creditable natural philosophy that would expose the naturalistic foundations of materialism as ultimately lacking in real explanatory power. The bulk of the Sermons was, therefore, taken up with the following task: to explore every possible natural explanation for the origin of matter and the presence of motion, and to demonstrate that God was responsible for the

⁴⁷ This legalistic tenor of the terms 'witnesses' and 'evidences' have not received sufficient scholarly attention. The term 'natural theology', with its concentration on propositions demonstrating the existence and attributes of the deity, has occluded the rhetorical and dramatic nature of the defence of Christianity as a judicial procedure, which takes its style from the theatre, the courtroom and the pulpit. For an interesting study, albeit of an earlier period, of the relationship between these three platforms see, Bryan Crockett, *The Play of Paradox: Stage and Sermon in Renaissance England* (Philadelphia, 1995).

creation and governance of the world.

Having outlined Bentley's main task in terms of use, proof and evidence, it is now possible to shed light on the structure of the eight Sermons, before proceeding to analyse their main themes. The opening sermon set the scene. It dealt with the depravity of infidelity, the stupidity of the atheist, and the particular form of atheistic materialism which most concerned Bentley - Epicureanism, both ancient and modern. Sermon two focused on the evidence against materialism drawn from human consciousness. In Sermons three, four and five, Bentley presented his confutation of atheism based on evidence drawn from the 'Structure and Origin of Human Bodies'. These three Sermons, concentrated on our physiology and illustrate the very wide range of natural philosophy with which Bentley was familiar. The three final Sermons formed the three parts of his exposé of the failure of contemporary natural philosophy to explain the origin and form of our universe based solely on mechanical principles.

It is also important to emphasise Bentley's familiarity with the most basic requisites of all rhetorical performances - the discourse must be suited to the audience, and the presentation of the Lecturer's character must be impeccable. The exordia to Bentley's first and second Sermons illustrate these rhetorical requirements. Bentley, who introduced the first Sermon by focusing on the familiar and disreputable figure of Epicurus, conflated ancient and modern materialism into the single entity of 'atheism' and charged its supporters with foolishness and corruption. Bentley's own character was raised by setting it in opposition to the deceitful and corrupt dissimulation of atheism, since Epicurus's acceptance of a deity was only a convenient subterfuge to avoid prosecution. Similarly, contemporary deists made the deity nothing more than a mere '*Muta Persona*', purely to avoid the 'Offence of the Magistrate'. For this reason, Bentley reminded his audience, Epicurus had, throughout history, been suspected '*Verbis Deum, Re sustulisse*' - that is, he left the name and title of God in the world but nothing of his substance and power.⁴⁸ Bentley, in his defamation of the character of Epicurus achieved several aims: all

⁴⁸ Bentley ridicules Epicurus's explanation for how we come by the notion of God as a 'quaint and airy Reasoning' and informs us that there is 'not now one Infidel living, so ridiculous as to pretend to solve the Phaenomena of *Sight, Fancy, or Cogitation* by those fleeting superficial Films of Bodies'. Leisome and Nicholl, *op. cit.*, i, p.3.

distinctions between the atheist and the deist were obliterated, since both were guilty of a denial of God's providence, Epicurus was an easily recognisable villain, and Bentley presented himself as an impeccable prosecutor. He had uncovered the defining characteristics of the crime of atheism: not so much the denial of God's existence, which could itself be politically disguised, but the duplicitous denial of God's providence.⁴⁹

The opening to the second Sermon provides further illustration of Bentley's enhancement of his own character. The sermon carried the title, 'Matter and Motion cannot think: Or, A Confutation of Atheism from the Faculties of the Soul', It was preached, April 4 1692 and the text was, Acts, 17: 27, *That they should seek the Lord, if haply they might feel after him, and find him; though he be not far from every one of us: For in him we Live, and Move, and have our Being.*⁵⁰ The scene at the Aeropagus involved a direct confrontation between Paul and the various schools of philosophy - the Aristotelian, the Epicurean and the Stoic. This allowed Bentley to re-enact Paul's presentation of basic Christian principles in opposition to those of the philosopher/atheist. Bentley described how the philosophers

*corrupted through Philosophy and vain Deceit, took our Apostle, and carried him unto Areopagus (a Place in the City whither was the greatest Resort of Travellers and Strangers, of the gravest Citizens and magistrates, of their Orators and Philosophers;) to give an Account of himself and the new Doctrine that he spoke of.*⁵¹

This historical scene enabled Bentley to launch a lengthy and scholarly exegesis on Paul's text. Paul, Bentley continued, had spoken to this 'promiscuous Assembly' with a 'most admirable Prudence and Art', accommodating his discourse 'to a known Error and Prejudice of some Party of his Hearers'. Bentley echoes Paul's strategy and calls it 'a Ground and Introduction not only to this present, but some other subsequent Discourses'.⁵² In the third sermon Bentley reaffirmed the similarity between his own tactics and those of Paul. The Apostle was no '*Babbler*', but

⁴⁹ Bentley argued that any denial of God's operative power was equivalent to a denial of his existence. Mere existence without providential control was, Bentley concluded, unworthy of the appellation 'creator'.

⁵⁰ For an analysis of Paul's rhetoric, see Dieter Werner Kemmler, *Faith and Human Reason: A Study of Paul's Method of Preaching as Illustrated by 1-2 Thessalonians and Acts 17, 2-4* (Leiden, 1975).

⁵¹ Letsome and Nicholl, *op. cit.*, i, p. 12.

⁵² *Ibid.*, p. 12.

*as Moses was learned in all the Wisdom of the Egyptians, so it is manifest from this Chapter alone, if nothing else had been now extant, that St. Paul was a great Master in all the Learning of the Grecks.*⁵³

Bentley, who had also made himself master of Greek learning, repeated Paul's performance at the Aeropagus in order to confound and bewilder the 'vain Philosophers' of his own day.

Bentley accomplished the confutation of vain philosophy through his systematic analysis of all available strategies which the mechanical and materialist atheist produced as an explanation of the origin and maintenance of the universe. It involved a three-pronged attack constructed from the topics of the mind, human bodies, and the universe. This gathering of evidence (*inventio*) from the twin sites of nature and reason could not have been more complete. He paraded, in the witness box, natural philosophers who had, by their own admission, failed to provide a mechanical explanation, *sui generis*, for the origin of matter and the power of motion. This strategy of appropriation permitted the witnesses - the best of contemporary natural philosophers - to speak for themselves, and by their own admission demonstrate that they could not offer a mechanical account of the origin and formation of the universe. In the following sections I will focus on selected themes in order to illustrate how Bentley deployed science for theological ends, by utilising the whole creation as a witness for Christianity.

4. 3. 2. The Crime of Atheism.

Bentley's programme divides naturally into two main parts: first, - in Sermon one - he determined that the crime of atheism exists and that individual atheists are culpable. The remaining Seven sermons were then devoted to the second task: the collection of evidence from the triple sites of the soul, the origin and frame of the human body, and the origin and frame of the universe. The evidence obtained from this investigation then led to a convincing proof of his accusation, that atheism is a crime and ought therefore to be punishable. However, the accusation had to be premised on the impossibility of arriving at atheism through reasoned speculation,

⁵³ The idea that Moses was the originator of true philosophy was a commonplace in seventeenth-century polemics. Cudworth attributes the original 'atomical' philosophy to Moses which was then subsequently corrupted by the Greeks. See. Danton B. Sailor, 'Moses and Atomism', *J. Hist. Ideas*, 25 (1964), 3 - 16. According to Sailor the identification of Moses as a proto-atomist suffered a decline in the eighteenth century.

and this required an initial confutation of the doctrine of innate ideas. He drew attention to the general agreement of scriptural authorities and exegetes, that the term 'atheist' in the psalmist's text does not refer *sensu strictu* to those who 'flatly deny' the being of a deity. These authorities hold this view, he explained,

from the commonly received Notion of an innate Idea of God, imprinted upon every Soul of Man at their Creation, in Characters that can never be defaced. Whence it will follow, that speculative Atheism does only subsist in our Speculation; whereas really human Nature cannot be guilty of the Crime.⁵⁴

If this interpretation was permitted then it was impossible to defend the accuracy of the Psalmist's complaint: atheism could not be a crime if it was the result of reasoned speculation. The Psalmist charged the atheist with being a fool for denying the existence of God in his heart and not just verbally: the latter move would be consonant with the presence of 'this native Light of the Soul' eclipsed merely for momentary lapses into sin. For Bentley the presence of this innate light would allow the resurfacing of impressions which could not fail to 'the Conviction of their Consciences'. Therefore, human nature itself would argue against the Psalmist, and the 'Fitness and Propriety . . . the very Truth of the Expression'. Whereas our nature must permit the possibility of the crime, i.e. the *foolish* denial of God attributable to reasons other than rational speculation. Moreover, the *de facto* presence of atheism and the denial of a truth indelibly imprinted could not, without contradiction, both exist at the same time. Bentley perceived that the doctrine of innate ideas was, therefore, dangerous and unnecessary:

As to that natural and indelible Signature of God, which human Souls in their first Origin are supposed to be stamped with, I shall show at a fitter Opportunity that it is a Mistake, and that we have no Need of it in our Disputes against Atheism.⁵⁵

The exordium to the second sermon also contained a sustained attack on the doctrine of innate ideas and was also based on Paul's text. By means of a combination of scriptural exegesis and Lockean epistemology Bentley emphasised the 'industry' required to find God. The Pauline injunction, 'they should seek the Lord',

⁵⁴ Letsome and Nicholl. *op. cit.*, i, p. 2.

⁵⁵ *Ibid.*, i, p. 2. Bentley's abandonment of this traditional argument for the existence of God was used to pre-empt the argument that atheism resulted from a failure to detect an innate notion of God. In this way the *de facto* existence of atheists was proof for atheism. Bentley, in his gloss on the phrase 'he [God] be not far from every one of us' (Acts 17. 27), resumed his attack on the doctrine of innate ideas.

carried the implication that the idea of God was not innate. An innate idea of God would also invalidate and make ridiculous some of Paul's remarks at Areopagus: phrases such as the 'unknown God' and 'ignorantly worshipping' would be superfluous, or even inconsistent, if the Athenians already possessed an innate idea of the true God.

That primary Proposition would have been clear, and distinct, and efficacious, and universal in the Minds of Men. *St. Paul* therefore, it appears, had no Apprehension of such a first Notion, nor made use of it for an Argument; which (since whosoever hath it, must needs know that he hath it) if it be not believed before by the Adversary, Is false; and if it be believed, is superfluous; and is of so frail and brittle a Texture, that, whereas other Arguments are not answered by bare denying without contrary Proof, the mere doubting and disbelieving of this must be granted to be *ipso facto* the breaking and confuting of it.⁵⁶

It was, argued Bentley, only the presence of natural powers in the mind, a gift from the deity, which provided us with an approximate knowledge of God.⁵⁷ By exercising these natural faculties, in empirical investigation of nature, the mind was forced to admit, unreservedly, the existence of a power involving more than mere mechanical operations. By considering our own bodies and minds, which have 'all the Stamps and Characters of excellent Contrivance' we ought to be convinced - even without recourse to the external world - of the need for a 'wise Author of Things'.⁵⁸ This denial of innate ideas prefaced Bentley's analysis of the evidence for *providence*. It permitted Bentley to concentrate fully on the presence of God's active power in the universe and moved his main argumentative strategy - the appropriation of natural philosophy - centre stage. This use of natural philosophy in the service of

⁵⁶ Letsome and Nicholl, *op cit.*, i, p 23. These arguments were used without any reference to Locke's *Essay on Human Understanding*. It is simply another instance of Bentley appropriating material into what was a Scripture-based account of human nature. LeClerc in a letter to Locke (1696) discussed Bentley's use of the former's views in the Boyle Sermons. Locke's reply to LeClerc mentioned his own dispute with Stillingfleet, and LeClerc responded by saying that Stillingfleet mattered little when someone like Bentley was publicising one's views. Perry Miller described Bentley's Sermons as fundamentally 'Lockean'. However, this is no more helpful than calling the sermons 'Newtonian' and for this reason it is important to see exactly why Bentley rejected the presence of innate ideas.

⁵⁷ The use of the qualifying 'approximate' was theologically necessary, since unaided reason was incapable of conveying the soul to God.

⁵⁸ The non-necessity of the discovery of God, Bentley argued, also protected us from fatalism: innate ideas and their concomitant necessitarianism would deny the freedom required by human beings to be moral agents who are in the exalted position of being able to choose or reject the conditions of salvation. Bentley also pointed out there was nothing in Scripture, nor in the articles of the Church which sanctioned the view that the proposition 'God Is' is indelibly imprinted on the soul.

theology was also an attack on Cartesianism which grounded certainty on the presence of congenital ideas in the soul.

Having dispensed with innate ideas as evidence for the existence of the deity Bentley proceeded to his main charge, that responsibility for the crime of unbelief lay totally with the individual atheist.⁵⁹ Because the denial of providence - the locus for the pious use of our natural faculties - was tantamount to a denial of the existence of God most of the Sermons were taken up with the evidence for God's superintendence of the universe.

*A God, therefore a Providence, was a general Argument of virtuous Men, and not peculiar to the Stoicks alone. And again, No Providence, therefore no God, was the most plausible Reason, and the most frequent in the Mouths of atheistical Men. So that it seems to be agreed on all Hands, that the Existence of God and his Government of the World do mutually suppose and imply one another.*⁶⁰

Bentley shifted the emphasis away from the relatively simple task of establishing that God existed - since even the deist accepts this - onto the more specifically Christian demonstration of a providentially governing role for God. The crucial move in Bentley's strategy was to link empirical investigation of the natural world with a *necessity* of providence. So obviously was there design and fitness in nature that atheists, whilst denying providence, were forced to use an alternative term to account for it:

they cover the most arrant Atheism under the Mask and shadow of a Deity; by which they understand no more than some eternal inanimate Matter, some universal Nature, and Soul of the World, void of all Sense and Cogitation, so far from being endowed with infinite Wisdom and Goodness..⁶¹

With the elimination of the threat from innate ideas Bentley had then to refute the Epicurean account of why we actually believe in the gods. Epicurus's account offered a naturalistic explanation for our perceiving the existence of the gods. The Epicurean theory explained vision, imagination, and thought itself, by certain 'thin Fleeces of Atoms', which enter the 'pores' of our senses and there excite ideas. This

⁵⁹ The atheist, having corrupted his natural faculties, due to a life of profligacy, was denied the natural capacity to witness God's providential role. Boyle used a similar argument in the *Christian Virtuoso*, claiming that the pious were more naturally disposed to enter the temple of nature than the irreligious.

⁶⁰ Letsome and Nicholl. *op. cit.*, i, p. 2.

⁶¹ Letsome and Nicholl. *op. cit.*, i, p. 3.

theory was also used to explain how we form the idea of God⁶² The Epicurean view, that all knowledge is derived empirically, therefore committed atheists to acknowledge the belief in the gods as an empirical fact, whilst excluding them from any governing role. They had, to use Bentley's classical hyperbola

bereaved [sic] that *Jupiter* of his thunder and majesty; forbidding him to look or peep abroad, so much as to enquire what news in the infinite Space about him; but to content himself and be happy with an eternal Laziness and Dozing, unless some rambling Troops of *Atoms*, upon the Dissolution of a neighbouring world, might chance to awake him.⁶³

Bentley recounted the Epicurean theory of vision in order to condemn the contemporary Epicurean as an atheist, ridiculing the 'quaint and airy Reasoning' of fleeting films of atoms as a poor refuge for deists. Thus there was no possible naturalistic account to explain our belief in the existence of gods. The Psalmist and the Israelites in general, Bentley explained, were not so curious about natural knowledge as the Epicureans, and a denial of God's 'Dominion' - even though his existence was accepted - was tantamount to atheism.

I have outlined Bentley's arguments at length because the crux of the charge against the atheist was the denial of God's 'Dominion over the World'. Bentley used natural philosophy for a theological purpose. He sought to show providential guidance at every point in time and space, once the creation *ex nihilo* had occurred. God was immediately present in his providential role as Dominus and 'pantokrator' the God of Israel. He was not the impersonal power of 'Nature' or the 'world soul'. In fact the substitution of these terms was, as Boyle and others had argued earlier in the century, an idolatrous act. Nature was represented by the deists as self-sufficient.⁶⁴ The God of Dominion was the antidote to the view that nature is self-sufficient. Moreover, nature itself, placed under the auspices of contemporary pious natural philosophy, provided the evidence which proved the crime of atheism. To reassert the Judaeo-Christian deity over the Pagan naturalism of the classical deists,

⁶² *Ibid.*, i, p. 3.

⁶³ *Ibid.*, i, p.

⁶⁴ The term 'nature' might be used as a substantive: both the *natura-naturans* (nature-naturing) of the scholastics, and the 'all wise Nature' of the deists offered, particularly in the latter case, a secularised enforming power - a *quasi* divine being - which demanded no worshipful response from its creatures. For an excellent historical discussion of the notion of an enforming power see, Norma E. Emerton, *The Scientific Reinterpretation of Form* (Ithaca/London, 1984), esp., Chapter Three, 'Mixture and Minima: The Beginnings of a Corpuscular Approach to Form'.

was Bentley's aim in appropriating science. As we saw in the previous section this was also one of the reasons for the antipathetic attitudes of Stillingfleet and Bentley towards the Cambridge Platonists.

Bentley never lost sight of the pious ends of Boyle's bequest nor of the occasion. He regularly appealed for a genuine practice of Christian piety and took the opportunity, in the first sermon, to contrast Christian worship, piety and tranquillity with the vested interests of the purportedly tranquil and virtuous Epicureans. The Epicureans denied the existence of divine retribution, which haunted human existence with the fear of damnation. Bentley responded that it was the guilty who feared punishment: the innocent have no such trepidation. In fact the

Christian, in Truth as well as in name, though he believe the consuming Vengeance prepared for the Disobedient and unbelievers, is not at all dismayed at the Apprehensions of it. Indeed it adds Spurs and gives wings to his diligence: it excites him to *work out his Salvation with Fear and Trembling* [Phil. 11. 12]; a religious and ingenuous Fear, that is tempered with Hope, and with Love, and unspeakable Joy. But if he knows that, if he fears him who *is able to destroy both Soul and Body in Hell* [Matth. 10.28], he needs not fear that his own Soul or Body shall ever go thither.⁶⁵

This exhortation reminds us that we are dealing with a sermon, an occasion, not only for the confutation of the irreligious, but also for the confirmation of worship and devotion in the minds and hearts of a predominantly Christian audience. Furthermore it serves to illustrate that the preaching of moderate Anglicans, notwithstanding Bentley's self-proclaimed reliance on the sole authorities of reason and nature, should not be reduced to a mere rationally derived moral code. W. M. Spellman makes this point in his interpretation of Latitudinarian theology. He argues for their commitment to inner regeneration. They were, he writes

Concerned with every aspect of public and private conduct, and establishing a difficult standard by which their contemporaries must measure their actions, the Latitudinarians insisted that all behaviour should issue from a genuine saving faith, a faith which rejected the emerging dichotomy between ethical and solely practical interests. They were rarely concerned with isolated moral problems, but sought instead to transform human character at large in the image of its original divine pattern, to reaffirm the validity of a Christian tradition which placed the requirements of the eternal before the

⁶⁵ Letsome and Nicholl, *op. cit.*, i, pp. 6 - 7. It was important that Bentley dealt with the Epicurean notion of *apathia* as it was common for the Deists to promote naturalised virtue and tranquillity in the absence of concern over the supernatural. See, M. J. Osler, ed., *Atoms, Pneuma and Tranquillity: Epicurean and Stoic Themes in European Thought* (Cambridge, 1992), esp., pp. 2, & 142, for an account of the importance of *apathia*, and *ataraxia* - the state of tranquillity.

exigencies of the merely mundane.⁶⁶

Bentley fits this pattern. The Christian, he argued, profits even in this life from adhering to those virtues which are not only conducive to gaining eternal salvation but enhance 'Health . . . Credit, or Estate, or Security.' By contrast envy, covetousness, and a 'discontented and anxious' mind are torments to the mind itself. The regenerated soul

can do all things through Christ that strengtheneth him [Phil. 4. 13]; he can patiently suffer all Things with cheerful Submission and Resignation to the Divine Will. He has a secret Spring of spiritual Joy, and the continual Feast of a good conscience within, that forbid him to be miserable. But what a forlorn destitute Creature is the Atheist in Distress? He hath no Friend in Extremity, but Poison, or a Dagger, or a Halter, or a Precipice. A violent Death is the last Refuge of the *Epicureans*, as well as the *Stoics*. This says *Lucretius*, is the distinguishing character of a genuine son of our Sect.⁶⁷

The series of proofs by which Bentley berated the atheist were not merely sustained invective on the 'character' of an infidel: they were drawn from the twin sites of experience (prudence) and the natural faculties of reason. The target of his learning, wit and ridicule was the corruption (in the minds of atheists) of these sites. Once having taken root in human nature this corruption operated, in the irreligious, according to 'interests', unguided by the universal rules of right reason or the dictates of nature. Epicurus served as an immediately recognisable model for all iniquity and absurdity and contemporary atheists were presented as mere representatives of the ancient subterfuge of hiding lustful interests under the guise of reason and nature.⁶⁸ Bentley placed himself within a tradition of defensive theology which capitalised on our innate disposition for investigating the world. It was in this arena - commonly acknowledged as an undisputed source of rationally acquired evidence - that Bentley displayed his rhetorical skills.

4. 3. 3. The Impossibility of Thinking Matter.

In the second sermon, using as his text *Acts* 17: 27, Bentley proposed to

⁶⁶ W. M. Spellman. *The Latitudinarians and the Church of England, 1660-1700* (Georgia/London, 1993), p. 7

⁶⁷ Letsome and Nicholl. *op. cit.*, i. p. 8.

⁶⁸ This has its origins in the early Church Fathers and especially interesting is the treatment of Epicurus in that fountainhead of natural theology and anti-Epicureanism, Lactantius' *Divine Institutes*. There was an edition of Lactantius' extant works in 1684, *Lucii Coelli Lactantii Opera quae extant, ad fidem MSS. recognita et commentariis illustrato a Tho. Spark A. M. ex Ade Christi* (Oxford, 1684). Spark was Prebend of Lichfield.

extract from St. Paul's text the 'proposition'

That the very life, and vital Motion, and the formal Essence and Nature of Man is wholly owing to the power of God: and that the Consideration of ourselves, of our own Souls and Bodies, doth directly and nearly conduct us to the Acknowledgement of his Existence.⁶⁹

Matter in itself was incapable of producing cogitation: irrespective of its refinement, it was intrinsically void of all the attributes of activity. The essential meaning of this passage from *Acts* was, therefore, that the existence of God (pure Spirit) was incontrovertibly demonstrated, and therefore binding as a belief. The evidence for this was obtained from

that near and internal convincing Argument of the Being of God, which we have from human Nature itself; and which appears to be principally here recommended by St. Paul in the words of the Text.⁷⁰

Bentley's interpretation of Paul's text was an injunction to examine the composition of our own nature that allowed him to formulate two main tasks. The first was, to prove that all human thought was due to the presence of an immaterial spirit. The second was, that the structure of our bodies demonstrate 'unquestionably the Workmanship of a most wise, and powerful, and beneficent Maker'. The first of these two tasks formed the substance of the second sermon, whilst the second was pursued in sermons three, four and five. The common underlying theme, was the complete passivity of matter.

Before Bentley could establish the complete passivity of matter it was necessary to show that our souls are immaterial: that there is no possible materialist explanation for thought and sensation. Bentley deployed the Cartesian tactic of appealing to experience, to demonstrate a 'something' in us

that thinks and apprehends, and reflects and deliberates; that determines and doubts, consents and denies; that wills, and demurs, and resolves, and chooses, and rejects: that receives various Sensations and Impressions from external Objects, and produces voluntary Motions of several Parts of our Bodies.⁷¹

⁶⁹ Letsome and Nicholl, *op. cit.*, i, p. 15. The text reads, 'That they should seek the Lord, if haply they might feel after him, and find him; thought he be not far from every one of us: For in him we Live, and Move, and have our Being'

⁷⁰ Letsome and Nicholl, *op. cit.*, i, p. 15. Bentley in his exegesis on Acts 17:28, glossed the phrase 'the nearness of God' to mean that which is closest to us - our bodies and minds.

⁷¹ *Ibid.*, p. 15. Although this demonstration was simply a reiteration of the Cartesian 'cogito' argument it was grounded on Bentley's exegesis of a particularly Christian doctrine. Since the doctrine of the Resurrection was historical fact, this, Bentley claimed, was empirical proof for the existence of an immortal soul. Although such a doctrine cannot be ascertained by either reason or

It was also self-evident that this power of life and cogitation must proceed from some cause. Hence, if these active powers were neither inherent in matter nor producible by matter, then there must be 'some cogitative Substance, some incorporeal Inhabitant within us' called spirit or soul.

He began by stating the following 'necessary' premise: if the cause of conscious activity arises from matter, then the power must be 'inherent' in matter, or is 'producible' in it by some motion or modification. Therefore, if this power could be shown not to result from either of the foregoing causes, then it must be due to the presence of something immaterial, 'some incorporeal Inhabitant within us, which we call Spirit and Soul'. The first suggestion was ridiculous: the idea that the faculties of 'Sensation and Perception' were inherent in matter led to the following absurdities:

Every Stock and Stone would be a percipient and rational Creature. We should have as much Feeling upon clipping a Hair of the Head, as upon pricking a Nerve. Or rather, as Men, that is, as a complex Being compounded of many vital parts, we should have no Feeling nor Perception at all. For every single Atom of our Bodies would be a distinct Animal, endued with Self-Consciousness and personal Sensation of its own.⁷²

No quantity of these individual living atoms could make one living creature any more than a swarm of Bees or a crowd of men or women can in aggregate form a single consciousness. Thus matter *per se* cannot give rise to sensation.

This left the argument that activity results from the mere modification of particles of matter: it was the action of one particle on another which produced thought and sensation. This account, Bentley proclaimed, was the 'Opinion of every Atheist and counterfeit deist of these Times, that believes there is no Substance but Matter, and excludes all incorporeal Nature out of the Number of Beings'.⁷³ To give a 'clear and full Confutation' of this universal argument he applied the method of division, or amplification, attacking six sub-propositions derived from the claim that thought arises from the modification of particles of matter. His aim was to provide a

nature, the philosophical discussion, into which Bentley transformed this purely theological notion, demonstrated that it was above, but not contrary to, either reason or nature.

⁷² *Ibid.*, p. 15.

⁷³ *Ibid.*, p. 15. The denigration of matter was a central theme in Bentley's Sermons. He presented, by means of a series of mocking tropes, such an absurd a picture of it that any suggestion of its capacity for more than mere inactivity was made to appear ridiculous. On the use of rhetorical tropes in ridiculing and satirising opponents, see Quentin Skinner, *Reason and Rhetoric in the Philosophy of Hobbes* (Cambridge, 1996), esp. pp. 395 - 425. Skinner provides a detailed identification of the technical figures and tropes used by Hobbes.

'true Notion and Idea of Matter': to show that 'no particular Sort of Matter, as the Brain and Animal Spirits' and no motion, super-added to matter, 'hath any Power of Sense and Perception'.⁷⁴

This true conception of matter was 'nothing else but Extension and Bulk': it was impenetrable, divisible, and passive: no two particles of matter could occupy the same place at the same time. Furthermore, the apparent differences in the textures of bodies was the result of motion and its power to configure the particles into different dispositions. All appearances and textures of material bodies, and all the secondary qualities, were only the result of sensory perception. Matter without motion was simply inert bulk. Lacking motion, nothing would excite our perception and without our senses, qualities did not exist:

Wherefore in the whole of Nature and Idea of Matter we have nothing but Substance with Magnitude, and Figure, and Situation, and a Capacity of being moved and divided. So that no Parts of Matter, considered by themselves, are either hot or cold, either white or black, either bitter or sweet, or betwixt those Extremes.⁷⁵

Thus all ideas of sensible qualities, Bentley concluded, 'are not inherent in the inanimate Bodies, but are the Effects of their Motion upon our Nerves, and sympathetical and vital Passions produced within ourselves'.⁷⁶ Thus on the basis of his true conception of matter as mere extension, and the acceptance of the primary-secondary quality distinction, he demonstrated that all cognition takes place in us.

The next step, therefore, was to investigate human nature itself. His attack on Descartes was directed at the possible use to which the materialist might put the notion of 'animal machines'.⁷⁷ He ridiculed the concept of 'rational Machine', in the

⁷⁴ *Ibid.*, p. 17

⁷⁵ Letsome and Nicholl, *op. cit.*, i, p. 16. Bentley unquestioningly accepted the *cogito* argument, the division of primary and secondary qualities, and the 'Galilean-Cartesian' concept of inertial motion.

⁷⁶ *Ibid.*, p. 17.

⁷⁷ See Descartes, *Treatise on Man*. French Text with Translation and Commentary by Thomas Steele Hall (Cambridge Mass., 1972), and the copious notes by the editor. Bentley attacked Descartes (and the Cartesians) several times during the sermons. He dealt with the sixth point in the atheist's list of defences, which argued that from 'Matter of Fact and Experience' it can be seen that body alone produces life, evidenced by the actions of animals. If animals exhibit signs of rationality, then it is the result of 'pure Mechanism', and Mankind could be seen simply as 'Engines of a finer Make and Contexture'. Whether or not animals are devoid of souls as the Cartesians claim, is not now, Bentley says, to be engaged in. It is of no consequence to religion to answer in the positive or the negative. Bentley's aim was to expose the contradiction of asserting that animals are mere machines, and at the same time possess the power of 'Thought, or Will, or Appetite, or

form of rhetorical questioning, asking ‘what Prerogatives’ this ‘understanding Piece of Clock-work’ might ‘challenge above other parcels of Matter’? Bentley continued to ridicule the concept of conscious matter by presenting absurd images: for example, the blood being conscious of its own redness, or the brain and the ‘Animal Spirits’ being conscious of their own powers of thought. Thus although atheists argue that the particles of thinking matter are so minute as to be imperceptible, yet, Bentley responded, they must have ‘determinate Figure’, possess ‘Modes and Affections of Magnitude’, and therefore possess only the attributes of extension and bulk. Since they have nothing more than the qualities of gross matter, cogitation can no more be in these minute particles than redness can be in gross ones

And what Relation or Affinity is there between a minute Body and Cogitation, any more than the greatest? Is a small Drop of Rain any wiser than the Ocean? Or do we grind inanimate Corn into living and rational Meal? My very Nails, or my Hair, or the Horns and Hoofs of a Beast may bid as fair for Understanding and Sense, as the finest Animal Spirits of the Brain.⁷⁸

He continued in this vein through the rest of the atheist’s defences closing each philosophical point with an absurd and paradoxical description of everyday material things that would have to be granted thought on the atheist’s account.⁷⁹

To further undermine the self-sufficiency of matter he ridiculed the notion of the Epicurean ‘Declination of Atoms’ by means of which they swerve from the vertical descent in infinite space. This ‘swerve’, the Epicureans claimed, was the cause of free-will or liberty and therefore was evidence for a power of cogitation in matter. Bentley exposed the contradictions inherent in this attempt to construct a consistent ontology from the notions of chance, necessity *and* a liberty of moving from a determined path:

It is as if one should say, that a Bowl equally poised, and thrown upon a smooth Bowling-Green, will run necessarily and fatally in a direct Motion; but if it be made with a Byas [sic], that may decline it a little from the straight Line, it may acquire by that Motion a Liberty of Will, and so run spontaneously to the Jack.⁸⁰

Sensation, or Fancy’.

⁷⁸ Letsome and Nicholl, *op. cit.*, vol. i, p.

⁷⁹ The parodic use of highly visual metaphors can be seen in his ridicule of the atheist’s claim that it is not the mere matter of animal spirits but motion *per se* which gives rise to perception and thought. Bentley remarks that ‘a Ship under Sail must be a very intelligent Creature’.

⁸⁰ Letsome and Nicholl, *op. cit.*, i, p. 20. The notion of being ‘made with a Byas’ implied a self-sufficiency in matter which might have eventually contributed to the production of consciousness,

Bentley's main endeavour in Sermon two was to develop a theory of matter, completely devoid of all activity. For example, his appropriation of the distinction between primary and secondary qualities was used to reduce the materials usually held responsible for cognition, the animal spirits and the brain, to the status of gross matter. Using the accepted definitions of the mechanical philosophy, Bentley had pre-empted the materialist move of postulating a specific kind of matter allied to something called 'motion' by showing that no species of matter could possess any attributes apart from those of gross matter. Motion itself was likewise shown to be inadequate to account for cognition. Thus Bentley ridiculed the materialist's *abuse* of the mechanical philosophy's foundational principles of matter and motion. By means of this strategy, Bentley re-appropriated the atomist ontology in the service of the theological claim for an immaterial substance.

4. 3. 4. The Mechanical Philosophy and the 'noble Frame' of the Human Body.

Sermons three, four and five discuss how the human body provides evidence of God's providence. The importance attached to this subject is shown by the fact that he devoted three sermons to the task. The evidence of skilful contrivance derived from various parts of the body, and from the organism as a whole, was as Bentley said, 'visible and past all Contradiction'. The 'great Dramatic Poem of Nature' was, for Bentley, the site of certainty in establishing the necessity of a God responsible for the formation and continuation of life.⁸¹

The third sermon made explicit the crux of the controversy between the atheist and the Christian. Both parties agreed on the obvious fitness, use and infinite variety of functions which human and animal bodies exhibit. However, that these features were claimed as evidence of controlled design and intentional wisdom, was, Bentley proclaimed, the 'religious Man's Account of the Frame and Origination of himself', which the atheist found so objectionable:

So that here will be the Point in Debate, and the Subject of our present Undertaking: Whether this acknowledged Fitness of human Bodies must be attributed, as we say, to a wise and good God; or as the Atheists averr, to dead senseless Matter.⁸²

without an immaterial agent.

⁸¹ Letsome and Nicholl, *op. cit.*, i, p. 24.

⁸² *Ibid.*, p. 24.

Bentley's aim was to close off every possible resort - 'Tricks and Methods of Deceit' - of the atheist so that there was no empirical defence for a naturalistic interpretation of the design argument. Science was deployed to call nature itself to the witness box and pronounce itself the work of a providential God. For example, in his answer to the atheist's charge, that our senses are deficient and therefore could not be the work of an omnipotent and all-wise creator, Bentley made effective use of the rhetorical strategy of *energia*. His depiction of the world as it might be, given an intensification of our sensory apparatus, relies on the conflation of the visual imagination with the visual power of the microscope.

[I]f the Eye were so acute as to rival the finest Microscopes, and to discern the smallest Hair upon the Leg of a Gnat, it would be a Curse and not a Blessing to us; it would make all Things appear rugged and deformed; the most finely polished Chrystal would be uneven and rough; the Sight of our own selves would affright us; the smoothest Skin would be beset all over with ragged Scales, and bristly Hairs: And besides, we could not see at one View above what is now the Space of an Inch, and it would take a considerable Time to survey the then Mountainous Bulk of our own Bodies.⁸³

He began his examination of 'all the Reasons and Explications' which the irreligious contrive, by employing the standard division of atheists into, Aristotelians, Astrologers, Mechanists and those who argue from 'Chance'.⁸⁴ All atheists, Bentley proclaimed, reason from one of these four positions. The first two are dealt with in the remainder of the third Sermon; the 'mechanical' in the following Sermon and the fifth Sermon engaged the arguments from 'chance'. Thus, these three Sermons form a concerted attack on all the possible arguments against a divine agent being responsible for the formation of living bodies.⁸⁵ In these attacks Bentley drew on the

⁸³ *Ibid.*, p. 25. 'Energia' refers to a vivid description which energises the imagination and brings images 'before the eyes' so that we may 'see' what is taking place. Richard A. Lanham, *A Handlist of Rhetorical Terms: A Guide for Students of English literature* (2nd. ed., Berkeley/Los Angeles/Oxford, 1991); Brian Vickers, *Rhetoric and the Pursuit of Truth: Language Change in the Seventeenth and Eighteenth Centuries* (Los Angeles, 1985). Bentley also makes effective use of it in his seventh Sermon when describing the nature of a true chaos and the formation of the universe out of that chaos.

⁸⁴ Letsome and Nicholl, *op. cit.*, i, p. 26. The divisions which Bentley used were fairly common in the latter half of the seventeenth century. See Boyle, *Origins of Forms and Qualities* (2nd. ed., 1667) where he attacked those who argue for a purely mechanical corpuscularianism along with those who argue from 'chance.' See also Cudworth, *op. cit.*, 'Preface'. Stillingfleet and John Ray also used similar categories.

⁸⁵ The fact that Bentley provided a separate sermon for the latter two signifies the threat which 'mere mechanism' and 'chance' held, by virtue of the power of these notions to topple weak Christians.

history of the Earth, astronomy, the mechanical philosophy, hydrostatics and the origins of life. The remainder of this section will illustrate his deployment of these Scientific resources.

Bentley engaged in a lengthy discussion of the possibility of a ‘natural’ explanation for the origin of the Earth and in particular the accepted fact of an ancient universal flood, since the atheist was unlikely to acknowledge the Mosaic account of a miraculous cause. This allowed him entry into several debates: at the same time he engaged the recent notion of Thomas Burnet on how the Earth could naturally produce enough water to cause a deluge sufficiently large to destroy mankind.⁸⁶ Bentley does not actually mention Burnet, since Boyle’s brief forbade him to attack another Christian. Arguing for the eternity of the world, the atheist might say there was not enough water to cover the mountain tops, therefore some humans had survived any number of deluges. In countering possible natural explanations, Bentley calculated that if the

Atmosphere itself was reduced into Water (as some think it possible) it would not make an Orb above 32 Foot deep, which would soon be swallowed up by the Cavity of the Sea, and the depressed Parts of the Earth, and be a very feeble Attempt towards an universal Deluge.⁸⁷

Ingeniously, he now applied the fact of the pressure of the atmosphere, established by Boyle, and asked, ‘what immense Weight is there above that must overcome the expansive force of the Air, and compress it into near the thousandth Part of the Room that it now takes up?’ There was, of course, no such natural power. For Bentley, or any religious person, the power required was therefore supernatural - ‘it was miraculous’. Yet the atheist may borrow Burnet’s ‘ingenious Notion’ that the original face of the Earth was smooth and the waters required for the deluge burst through the smooth crust giving rise to the rugged and misshapen aspect of the globe. Bentley replied that the destruction would be so great that it would still require the miraculous production of new species, and an ‘Architect’ of immense power to construct a new world from the ruins of the old.⁸⁸

⁸⁶ Thomas Burnet, *The Sacred Theory of the Earth: Containing An Account of the Original of the Earth . . .* (6th ed., London, 1726). For a general discussion of this issue, and especially Burnet’s treatment of the Noachian deluge, see Kubrin, ‘Providence and the Mechanical Philosophy’, pp. 121 ff.

⁸⁷ Letsome and Nicholl, *op. cit.*, i, p. 28.

⁸⁸ *Ibid.*, p. 29.

Recent findings in astronomy were utilised against the arguments of those Bentley called the 'astrological atheists'. His attack was grounded on their high opinion of 'Observation.' He explained how the 'whole Credibility of this planetary Production of Mankind must depend' on the traditions of antiquity. However, neither the Chaldeans nor the Egyptians, the originators of this system, record a single instance of man being produced by the action of the stars. The astrologers also required regular and law-like relations between the signs of the Zodiac. If there were 'no counsel at the Making of the World', Bentley asked, how come the astrologers argue for such harmony and law-like regularity? More importantly, recently discovered astronomical facts, such as the ring of Saturn and the moons of Jupiter, would have effected hundreds of 'eclipses' between us and the planets. These must, if astrology be true, make an additional influence so varied that it would be impossible to reduce it to computation. Bentley's trump card was, however, the 'Truth of the Copernican *System*' which, having removed the Earth from the centre of the universe, would pose insuperable problems for a system adapted to the former 'vulgar *Hypothesis*' of the ancients - especially the Ptolemaic.

Bentley also continued, and intensified, his appropriation of the mechanical philosophy in the service of religion:

The mechanical or corpuscular Philosophy, though peradventure the oldest as well as the best in the World, had lain buried for many Ages in contempt and Oblivion, till it was happily restored and cultivated anew by some excellent wits of the present Age. But it principally owes it [sic] Re-establishment and Lustre to Mr. Boyle, that Honourable Person of ever blessed Memory, who hath not only shewn its Usefulness in Physiology above the vulgar doctrines of real Qualities and substantial forms, but likewise its great Servicableness to Religion itself.⁸⁹

So far was the mechanical philosophy from endangering religion that the phenomena of the natural world were shown to require an added power over and above the attributes of matter. The power of 'Gravity' was therefore the active agent responsible for the 'present Frame and System and all the established laws of nature.'⁹⁰ These were constituted and preserved by gravitation alone. This power

⁸⁹ *Ibid.*, p. 32. Bentley considered that the atomist ontology was 'providentially one of the best Antidotes against their other impious Opinions; as the Oil of Scorpions is said to be against the Poison of their Stings' - especially as it was accepted by both the religious and the irreligious -

⁹⁰ *Ibid.*, p. 33. In the Epicurean system gravity is essential to matter. The swerve of particles - falling in the infinite void - from a linear path, was the only source of cohesion or repulsion. This aspect of Epicureanism caused Newton to protest against the view which considered gravity to be

was the 'Cement' that holds everything together. It could be reconciled with the scriptural words of Job: '[it] stretcheth the North over the empty Space, and hangeth the Earth upon Nothing', once Job's expression was transferred from 'the first and real Cause to the secondary Agent'.⁹¹

Without Gravity the whole Universe, if we suppose an undetermined Power of Motion infused into Matter, would have been a confused Chaos, without Beauty or Order, and never stable and permanent in any Condition.⁹²

He explained how he intended to prove in 'due place' that gravity (the basis of mechanism but not itself mechanical) was the immediate, 'Fiat and finger of God, and the Execution of the Divine Law'. Without it bodies would have no power of tending to a centre. Without it no compound bodies could subsist and continue. If, Bentley argued, 'Gravity do immediately flow from a Divine Power and Energy', then it will make no difference to the case even if the atheist could explain the origin of animals and of all particular effects from purely mechanical causes. The divine origin of the power of gravity, proclaimed Bentley, served to 'undermine and ruin all the Towers and Batteries that the Atheists have raised against Heaven'.⁹³

Having established the necessity of a power of cohesion and direction, Bentley allowed the atheist to argue that even if motion were eternal and inherent in matter, it could never produce organisation. Therefore, the atheist must provide an hypothesis (at least) explaining how the first production of humans was effected by an inherent activity which could be no more than 'undirected Motion'. The atheist had to show how it was possible for that motion to permit matter to organise itself, 'without ever erring or miscarrying', into the 'curious formation of human Bodies'. No one had seen this happen: therefore, the atheist's hypothesis must explain how the laws of mechanism, caused the production of organised body. Both ancient and

inherent in matter. See, section 4. 4 below, where I discuss the letters between Newton and Bentley.

⁹¹ *Ibid.*, p. 33. Bentley is quoting Job. 26: 7.

⁹² See, below, for an examination of Bentley's arguments against the chaos of the atomists, where he deployed Boyle's 'elastic' expansive power (tending to disperse matter into a chaos), and the 'Cement' of Newton's gravitational force which acts as the cohesive power in organised matter. He described Boyle's elastic force as 'of more Importance in all Physiology than any one Invention since the Beginning of Science'. The tension generated by these two opposing forces drives the 'great Circulation' of nature under the controlling agency of God. See, Letsome and Nicholl, *op. cit.*, i, p. 28. for an example of Bentley's use of the 'elastic' power in nature and its expansive force in dealing with the generation of living bodies.

⁹³ Bentley allowed the atheist that gravity could be 'inherent' to matter, but defied him to demonstrate how a human body could at first be produced under 'the present System of Things, and the mechanical Affections of Matter'.

modern atheists had attempted versions of this hypothesis. Bentley's examples from antiquity were delivered in order to make his adversaries appear laughable. Deploying parody and irony he recommended the 'witty Conceit of Anaximander'; 'the no less ingenious Opinion of the great Empedocles; 'the Divine Doctrine of Epicurus and the Egyptians' as possible sources for the atheist.⁹⁴ His aim was to convey an absurd image of the atheist rummaging through the moribund and fantastic systems of the ancients, merely to support the view that it was possible that the spontaneous production of organised body had 'somehow' taken place. However, Bentley argued, since the atheist did not deny that the 'same Laws of Motion, and the like general Fabric of the Earth, Sea, and Atmosphere, at the Beginning of Mankind' were still operating,

[t]o violate and infringe them, is the same as what we call Miracle; and doth not sound very philosophically [sic] out of the Mouth of an Atheist . . . Bodies were endowed with the same Affections and Tendences [sic] then as ever since . . . if an Axe-head be supposed to flote upon Water, which is specifically much lighter than it, it had been supernatural at that Time, as well as in the Days of *Ilishu*.⁹⁵

Bentley also used recent work on hydrostatics to show that the laws of fluids demonstrate the impossibility of the formation of a human body on mechanical principles alone. The primal fluid must have been subject to the laws of fluid mechanics which cannot be infringed because that would be a 'miracle' which no serious atheist can admit. Bentley drew on the works of Archimedes and Stevin on the formation of bodies in a fluid, who assumed that the positions which different materials would occupy in a homogeneous fluid depended on their specific-gravities. This 'Catholic Rule of Statics' demanded that heavier bodies always sink to the bottom. Experimental philosophy was used by Bentley to show how the formation of the human body can never be 'reconcilable to this hydrostatical Law' without an overriding miraculous power. Only a miracle can make the 'heavier Particles of Bone ascend above the lighter ones of Flesh, or depress these below those, against the

⁹⁴ Anaximander postulated an origin for humans in some warm moisture enclosed in a crustaceous skin 'as if they were various Kinds of Crabfish and Lobsters' and when they arrived at the proper age they simply burst out. Empedocles envisaged Mother Nature producing vast quantities of limbs which at their full growth came together to form human shapes. Epicurus 'and the Egyptians' argued that there was growing in the Earth a 'Sort of Womb' having roots in the Earth which attracted a 'milk' to nourish the foetus which on reaching maturity broke through the membranes.

⁹⁵ Letsome and Nicholl, *op. cit.*, i, p. 34.

Tendency of their own Nature.’ This, he triumphantly jested,

would be wholly as miraculous, as the Swimming of Iron in Water at the command of *Elisha*; and as impossible to be, as that the Lead, of an Edifice should naturally and spontaneously mount up to the roof, while the lighter Materials employ themselves beneath it.⁹⁶

Furthermore, the possibility of all the parts of the ‘*Embryon*’, forming at the same time, would require co-operation and the corpuscles of matter having consciousness and deliberation.⁹⁷ However, the notion that matter could be conscious was only a rhetorical suggestion, as he had already presented his audience with the absurd consequences of such a hypothesis

In his argument from the formation of living bodies he supported Harvey against Descartes.⁹⁸ The point at issue was the question of what began the process of life. Was it the blood or the heart? He attacked Descartes’ solution, in *De formatione foetus*, on the grounds that the ‘little ferment’ beginning in the blood would by the time it expanded to the arteries have lost its ‘elastical force’: if it retained that force then it would break through its receptacle as other fermenting forces do.⁹⁹ Bentley derived the notion of ‘elastic’ force from Boyle’s work. It is important to note that Bentley did not simply seek signs of design; instead, he appealed to detailed theories of the constitution of bodies. For example, in his account of the complexities of the formation of the ventricles of the heart and the production of veins he offered a curious, but delightful, critique of Descartes’ primary fermenting ‘bubble’: that the bubble, even if it could make a heart, would ‘by reason of its comparative Levity to the Fluid that encloses it . . . necessarily ascend to the Top’ and as a consequence we should not find, contrary to experience, the heart in the middle of the body. In his deployment of the mechanical laws of hydrostatics

⁹⁶ *Ibid.*, p. 34.

⁹⁷ *Ibid.*, p. 35. He argued that, ‘such a mutual Communication of every Vessel and Member of it, as gives an internal Evidence that it was not formed successively, and patched up by Piecemeal. So uniform and orderly a System with innumerable Motions and Functions, all so placed and constituted as never to interfere and clash with another, and disturb the Oeconomy of the Whole, must needs be ascribed to an intelligent Artist.’

⁹⁸ Bentley did not include Newton with Harvey and Boyle in his reference to the ‘great Luminaries’ of the English Nation. Moreover, gravitation - its crucial role later in the Sermons notwithstanding - does not figure at this point in Bentley’s discussion of the ‘vital Pulse’, or ‘great Circulation of Nature’.

⁹⁹ For further discussion on *De formatione Foetus*, see Gary Hatfield, ‘Descartes’ Physiology and its Relation to His Psychology’, in John Cottingham, ed., *The Cambridge Companion to Descartes* (Cambridge, 1992), 335-70, esp. p. 337). *The De formatione* was published posthumously in 1664..

Bentley sought to demonstrate the contradiction inherent in the claim that these laws were sufficient to begin and form human bodies. Thus, *a fortiori*, there was need of a miracle. Nature itself was witness to its own insufficiency.

In his critique of materialism Bentley used the laws of mechanical formation, fluid mechanics, statics, and recent work on embryonic origins, which he obtained from Swammerdam's *Historia Insectorum*.¹⁰⁰ He concentrated on the origins and formation of living bodies, because even the irreligious agreed on the universally acceptable fact of mechanical design in bodies. However, even if matter possessed an innate power, it was incapable of directed organisation:

Let Mechanism here make an Experiment of its Power, and produce a spiral and turbinated Motion of the whole moved Body without an external Director. When all the Organs are once framed by a supernatural and divine Principle, we do willingly admit of Mechanism in many Functions of the Body; but, that the Organs themselves should be mechanically formed, we conceive it to be impossible and utterly inexplicable.¹⁰¹

Bentley also utilised contemporary discussions of the spontaneous generation of living things from 'putrefied Carcasses and the warm Moisture of the Soil', since this was an obvious source for the atheist's account of the *formation* of life by mechanical means. He traced the origins of this claim, that insects were generated by putrid matter, to the 'oldest Remains of Atheistical Writings': sources which had given 'so much Countenance and Shadow of Possibility to the Notion of Atheism'. Contemporary science, especially the mechanical philosophy, had experimentally undermined this possibility. However, the atheist might counter this experimental evidence by arguing that the ancient production of life was possible because the atmosphere was then differently constituted. Using the notion of gravitation, Bentley demonstrated that this claim was untenable.¹⁰² In support of his position he referred

¹⁰⁰ On Swammerdam see, Abraham Schierbeek, *Jan Swammerdam (1633 - 1680) His Life and Works* (Amsterdam, 1967). Bentley also used Swammerdam's account of the embryos of ants and elephants being the same size in order to claim that there must, therefore, be a law which organises the limits of growth. For a very fine discussion of the relationship between Swammerdam's religious intensity and his scientific work, see Rucstow, Edward G. 'Piety and the Defence of Order: Swammerdam on Generation', in M. J. Osler and Paul Lawrence Farber, eds., *Religion, Science, and World View Essays in Honour of Richard Westfall* (Cambridge, 1985), pp. 217 - 41.

¹⁰¹ Letsome and Nicholl, *op. cit.*, i, p. 37. If the atheist answered these problems, Bentley assured him that he had many more of the same type of argument in store, but that they were too difficult and 'Unfit for a popular Auditory'.

¹⁰² Because of gravitation, Bentley argued, the quantity of moisture, on or near the Earth, had remained invariable, since it cannot escape from the atmosphere. In that case, as life depends on fluidity, we would expect to see a similar production of spontaneous life forms in the present.

to 'Observation and Experiment' as authorities which carried 'the strongest Conviction with them, and make the most sensible and lasting Impressions'. For example, experiment had undermined a favourite case of the atheist, by demonstrating that maggots and flies were not produced by putrefied matter. This was amply demonstrated by the 'sagacious and learned Naturalist, Francisco Redi' from 'innumerable Trials' on decaying flesh and vegetation.¹⁰³ Only when Redi's hermetically sealed glasses were opened to the atmosphere could living things be bred. Much of the remainder of the Sermon was enriched by philosophical explanations of an enormous range of issues, often combining Scripture with experimental explanations.¹⁰⁴ Malphigi's widely known experiment that soil, without seeds, cannot produce living things was incorporated. Against the argument that fossil shells were 'sports' of nature, Bentley explained, that these had once belonged to 'real and living Fishes'. He also criticised the 'Credit and Authority' of the old stories, such as van Helmont's claim, that 'foul Linen' steeped for twenty one days in a vessel containing wheat turned the wheat into mice. He dismissed this claim as the 'Philosophy and Information of some House-wife' who was careless in protecting the wheat-jar.¹⁰⁵

Bentley contrasted stories of spontaneous generation with the modern authorities of Redi, Malphigi, Leewenhoeck and Swammerdam. These undisputed authorities of 'Observation and Experiment,' confirmed the Scriptural account in which life was produced by God's fiat. These 'ingenious investigators', of the modern mechanical philosophy were deployed not only to demonstrate that there was

However, the world was actually now more moist, because rain and erosion gradually used up the land. It was only the production of animals, who use water but did not return to water, which 'keep Things at a Poise'. Without this balance the 'Divine Power' would need to 'interpose' and change the 'settled course and Order' of nature, which, Bentley claimed, had a general tendency to liquification.

¹⁰³ *Ibid.*, p. 39. Francesco Redi, *Experimenta de generatione insectorum* . . . (Amsterdam, 1671).

¹⁰⁴ The story of how the manna in the desert bred worms the morning after the Israelites had feasted, was explained from the 'fact' that under microscopes it was observed that seeds contained, 'real and perfect Plants with Leaves and Trunk curiously folded up and enclosed in the *Cortex*'. He warned against taking the expression of Moses literally, and allowed that the term 'breeding' was couched in the language of the vulgar. The microscope had enlarged Bentley's access to the mechanical workings of providence. See Catherine Wilson, *The Invisible world: Early Modern philosophy and the Invention of the Microscope* (New Jersey, 1995).

¹⁰⁵ Ruestow remarks on the number of naturalists in the seventeenth century who argued against the concept of spontaneous generation. Swammerdam, 'repeatedly associated it with atheism and denounced it as a godless opinion sustained by a heathen philosophy'. *Op. cit.*, p. 230.

design and order in the universe, but also to argue for the harmonious fit between the scriptural account of a miraculous origin and the mechanical. Bentley concluded his fourth sermon with an added emphasis on the passivity of matter without an infusion of divine power:

An eternal Sterility must have possessed the World, where all Things had been fixed and fastened everlastingly with the Adamantine Chains of specific Gravity; if the Almighty had not spoken and said, *Let the Earth bring forth Grass, the Herb yielding Seed, and the Fruit-tree yielding Fruit after its Kind; and it was so.* It was God that then created the first seminal Forms of all Animals and Vegetables, *that commanded the Waters to bring forth abundantly, und the Earth to produce living Creatures after their Kind; that made Man in his own Image after his own Likeness; that by the Efficacy of his first Blessing made him be fruitful and multiply, and replenish the Earth; by whose alone Power and Conservation we all Live, and Move, and have our Being.*¹⁰⁶

The fifth sermon is the third and last part of the confutation from the evidence of our own bodies and souls. It dealt with those who claimed that 'Mankind came accidentally into the World, and hath its Life and Motion and Being by mere *Chance* and *Fortune*.¹⁰⁷ There is not space here to deal with Bentley's discussion in his fifth sermon. However, the notions of fortune and chance are considered in the next section.

Having marshalled his evidence from the human mind and body, Bentley turned in the remaining three sermons to the visible universe. Revelation pronounced how the heavens declared the glory of God, and Bentley showed that reason and nature corroborated in the charge that atheists wilfully ignored this declaration. In the next section of this chapter I analyse the *use* of Newton's *Principia* in these final Sermons. I also provide an account of the relationship between him and Bentley based on these Sermons and the surviving letters of their correspondence.¹⁰⁸ However, in separating these three Sermons from the five that preceded them I do not wish to signify a natural division. The final sermons fitted Bentley's overall

¹⁰⁶ *Ibid.*, p. 41.

¹⁰⁷ *Ibid.*, p. 42. Bentley denied that the terms 'chance' and 'fortune' signified real substantial beings and accused the atheists of reification.

¹⁰⁸ Historians, in analysing Newton's four letters, have not adequately considered Bentley's surviving letter to Newton (18 February 1693). See Turnbull, iii, pp. 246 - 52. The letters from Newton to Bentley are in, Turnbull, iii, pp. 233 - 36; 238 - 40; 244; 253 - 56. They are reproduced in, I Bernard Cohen, *Isaac Newton's Papers and Letters on Natural Philosophy and Related Documents* (Cambridge, 1958), 280 - 312. Unfortunately, Cohen does not include the letter from Bentley. Turnbull also provides helpful notes.

programme. Ignoring the continuity of Bentley's strategy has led to significant misinterpretation by previous commentators. My account redefines Bentley's use of Newton as part of the sustained deployment of natural philosophy begun in the earlier Sermons. Thus his debt to Newton is placed on a par with his debts to Boyle, Redi, Malphigi, Swammerdam and other natural philosophers, both ancient and modern.

4. 4. Bentley and Newton.

The received account of the relationship between Bentley and Newton is constructed on two misconceptions. First, in 1691 - prior to Boyle's inclusion in his will of the codicil relating to the Lectureship, Bentley is thought to have consulted Newton *personally* for assistance in reading the *Principia*. The second, and more serious error of interpretation is that he asked for help in the *preparation* of his Boyle Lectures. From these two perspectives Bentley has been relegated to the status of 'disciple', barely able to comprehend the abstruseness of the *Principia*, whilst Newton is represented as the supportive and occasionally reprimanding 'master'.¹⁰⁹ John Gascoigne, for example, describes their relationship as follows:

Bentley, the inaugural Boyle lecturer for 1692, was barely competent to follow the *Principia*, he nonetheless saw in this work a useful source of illustrations of the argument from design. In his famous correspondence with Newton, Bentley obtained the Master's enthusiastic support for the basic goal of using Newtonian natural philosophy as an ally in the cause of religion and his rather more qualified support for taking up particular aspects of the *Principia* as a means of bolstering his design argument.¹¹⁰

Gascoigne is correct to claim that the *Principia* was a 'useful source': however his capitalisation of the term 'master' is gratuitous and his description of Bentley's use of Newton's natural philosophy as 'bolstering his design argument' is perplexing in that it closes off further analysis of the sophisticated use to which Bentley put Newton in an oratorical setting. As the first edition of the *Principia* contains only one reference to God, this paucity of theological material generates the problem of explaining why Newton's work became 'closely associated with the cause of Christian apologists.'¹¹¹

¹⁰⁹ The fact that the only surviving letter from Bentley to Newton contains the main themes of the published seventh Sermon shows that Bentley did not require instruction from Newton.

¹¹⁰ John Gascoigne, 'From Bentley to the Victorians: The Rise and Fall of British Newtonian Natural Philosophy', *Science in Context*, 2 (1988), 219 - 56, p. 222.

¹¹¹ *Ibid.*, p. 221. Gascoigne draws this information from Manuel's, *The Religion of Isaac Newton* (Oxford, 1974), p. 31. For a more detailed discussion of Newton's 'theological' interests see, Scott Mandelbrot, ' "A duty of the greatest moment": Isaac Newton and the Writing of Biblical

Gascoigne concludes that Newton ‘retrospectively’ sanctioned the association between the *Principia* and Anglican apologetics. Gascoigne’s reliance on this *ad hoc* Newtonian retrospective blessing, provides an explanation of Bentley’s use of natural philosophy, which has thus far determined the interpretation of the Boyle Lectureship by several historians.

Newton’s opening remarks in his first letter to Bentley have also provided a shibboleth for this interpretation. However, if Newton had his ‘Eye upon such Principles as might work with considering Men, for the belief of a Deity’ that task was not pursued in the original *Principia*. The interpretative ‘tradition’ has been blinkered by a series of misunderstandings which have served to support the master-disciple characterisation. Moreover, this retrospective appreciation on Newton’s part, of the usefulness of his own views for theological ends, was not due to Bentley. Another hermeneutic dead-end has been generated by a concentration on the ‘pray do not ascribe’ phrase in Newton’s second letter.

You sometimes speak of gravity as essential & inherent to matter: pray do not ascribe that notion to me, for ye cause of gravity is what I do not pretend to know, & therefore would take more time to consider of it.¹¹²

When placed in the context of Bentley’s strategic needs this infamous phrase shows that Newton’s views were not misunderstood by Bentley, who was very much in control of his immediate requirements. In this section I offer a different reading of Bentley’s use of Newton’s natural philosophy.

William Whiston claimed that Bentley first met Newton in 1696, when he introduced them. Mordechai Feingold supports Whiston’s claim, based on the rather formal tone and content of the earlier correspondence between Bentley and Newton, which indicates that the two were as yet unacquainted in late November 1692.¹¹³

Criticism’. *BJHS*, 26 (1993), 281 - 302.

¹¹² Turnbull, *op. cit.*, iii, p. 240.. In a recent paper focusing on this phrase, John Henry argues that the innateness of gravity was a legitimate interpretation on Bentley’s part. He also recognises the conditional nature of Bentley’s statements and the importance of the Epicurean notion of ‘declination’, or *clinamen*. See, John Henry, “‘Pray Do Not Ascribe That Notion to Me’: God and Newton’s Gravity”, in, James E. Force and Richard H. Popkin, eds., *The Books of Nature and Scripture: Recent Essays on natural Philosophy, Theology, and Biblical in the Netherlands of Spinoza’s Time and the British Isles of Newton’s Time* (Dordrecht/Boston/London, 1994), pp. 123 - 148. John Henry very kindly sent me a copy of this paper prior to publication.

¹¹³ It is crucial, for Jacob’s argument, that Newton was instrumental in selecting Bentley. James E. Force endorses the role of Newton in the selection of Bentley, ‘There is good evidence that Newton participated with the executors of Boyle’s will, particularly Pepys’. However, Pepys was not an executor of Boyle’s will. Force is mistaken in his interpretation of Pepys’ remarks to Evelyn, ‘. . .

Whiston's account of their meeting is interesting as he claims that Newton was so offended by Bentley's comments that he refused to speak to him for a year! According to Whiston, Bentley approached Newton in 1696 concerning the Scripture-prophecies, asking him to '*demonstrate*' (by means of chronological computation) Bentley's own opinions, and Newton took offence at being regarded as a mere '*mathematician*'.¹¹⁴ Thus in the light of Whiston's later comments, internal evidence from the style of the letters, and some remarks of Bentley, it is highly likely that Bentley had first contact with Newton by letter. Turnbull notes that Newton's reply - dated December 10 1692 - five days after Bentley had delivered his final sermon on December 5, 'is endorsed in Bentley's hand - 'Mr Newton's answer to some queries sent by me after I had preached my two last sermons'.¹¹⁵ Bentley, therefore, did not apply for help with the Sermons and any assistance which Bentley received was therefore not used in the delivery from the pulpit. Newton's role is in fact expressly stated by Bentley. He asked Newton, 'to acquaint me with what you find . . . yt is not conformable to the Truth & your Hypothesis'. The correspondence was undertaken by Bentley in order to ensure that no possible avenue was left open for a mechanistic account of the origin or maintenance of the universe. This would, as Bentley wrote, put his 'mind . . . very much at ease' before the 'discourses' were out of his 'power'.¹¹⁶

The standard interpretation receives further support from the existence of an earlier correspondence in which Bentley requested help in understanding the

forasmuch as (Mr. Boyle being gone) wee shall want your help in thinking of a man in England fitt to be sett up after him for our Peireskius . . .', Tanner, *op. cit.*, 9 January 1692. See, Force, *William Whiston: Honest Newtonian* (Cambridge, 1985), p. 192, fn., and p. 75 where Force discusses Pepys' letter.

¹¹⁴ William Whiston, *Memoirs of the Life and Writings of Mr. William Whiston. Containing Memoirs of several of his Friends also* (London, 3 vols., 1749 - 50) - continuous pagination is used in this edition - see p. 107 for Whiston's account of the meeting. The italicised words are Whiston's.

¹¹⁵ This locates the date of Bentley's first letter to Newton somewhere between 5 and 10 December 1692.

¹¹⁶ Turnbull, *op. cit.*, iii, p. 246. He means before they go to the printers - Bentley delayed publishing his final two Sermons - much to the annoyance of Tenison. See his letter to Evelyn, 24 March 1693 apologising for the delay, in Wordsworth, *op. cit.*, I, pp. 74 - 5; also, Evelyn to Tenison, 29 May 1694, Bray, iii, p. 341, where Evelyn asks Tenison to 'mind him [Bentley] of the Sermons he owes us and the public'. This obviously refers to Bentley's second series of Boyle Sermons. There is also a series of letters in 1697 which narrates Evelyn's unsuccessful attempts to reinstate Bentley as Boyle Lecturer, Wordsworth, *op. cit.*, i, *passim*.

Principia. However, Feingold points out there is no evidence that this earlier request in 1691 was a direct application to Newton from Bentley. The relevant document is a copy, in Bentley's handwriting, and not an original from Newton. The crucial question is why didn't Bentley preserve the original as he did the four later letters? Feingold suggests that Bentley copied the original which had been forwarded to him from either John Craig or William Wotton the original recipient of Newton's instructions. The original request for help from Bentley had been sent to Craig. Craig, after receiving instructions from Newton sent his instructions to William Wooton. Bentley, perhaps considering that the instructions were far too demanding asked for further help, probably using Wotton as an intermediary. These further instructions were then dispatched to Bentley who copied them and returned the original letter to its owner. The claim that Bentley contacted Newton prior to his letter of December 1692 is thereby considerably weakened. This scenario also casts further doubt on Newton's purported role in the selection of Bentley as first Boyle lecturer, since Newton did not know Bentley at this time. That they did not know each other receives further confirmation from the surviving letter (18 February 1693) from Bentley to Newton. Bentley apologises for presuming to interrupt Newton's 'worthy design' with 'Questions from a Stranger'.¹¹⁷ It is surprising that historians have failed to comment on Bentley's description of himself as a 'Stranger.' Furthermore, it is unlikely that he would have described himself as a 'Stranger' if he had already contacted Newton eighteen months prior to this remark and if Newton was involved in the selection of candidates for the Lectureship.¹¹⁸

As already indicated, and as Feingold, following the much earlier suggestions of Jebb, points out, Bentley's earliest interest in the *Principia* was most likely connected with his projected edition of the astronomical poem of Manilius. This earlier reading of the *Principia* and related material would, of course, have provided him with information which he later incorporated into his Sermons. His letters to

¹¹⁷ Turnbull, *op. cit.*, iii, p. 246. This letter from Bentley is a reply to Newton's third letter, and from the tone of Newton's third letter it was to be his final comments to Bentley. Bentley made it clear that his letter was an 'Abstract and thread' of his 'first unpublisht sermon', *viz.*, his seventh.

¹¹⁸ The style of the correspondence is decidedly formal in comparison with the warmth and effusiveness of the correspondence between Newton and Locke - even during the period of the lapse in their friendship. See Lord King, *The Life and Letters of John Locke, with Extracts from his Journals and Common-Place Books* (London, 1858), pp. 217 - 29.

Newton in late 1692 were only to ensure that his theological use of materials from the *Principia* was legitimate. According to formal scholarly etiquette Bentley was required to clarify doubtful matters prior to publication. The surviving letter from Bentley demonstrated his capacity to engage in debate on the many technical points which he had utilised from Newton's *Principia* and other works on mechanics and astronomy. Newton's guarded response turned a formal acknowledgement of assistance into an extended exchange of letters, occasionally less than friendly. This tenor of cautious 'disputatio' between scholars has been mistakenly interpreted as Bentley's deference towards Newton. Bentley's overall programme - which was discussed above - accounts for the presence of Newtonian material in the sermons. The remainder of this section is therefore concerned with analysing Bentley's strategic use of the *Principia* within that overall strategy. This requires that we treat the three final Sermons as a unit within a triple-pronged assault on all possible defences of atheism based on naturalistic explanations.

The sixth, seventh and eighth Sermons carry the general title, 'A confutation of Atheism from the origin and Frame of the World'. The sixth sermon, which has received little attention from historians of science, laid the groundwork.¹¹⁹ At the commencement of this Sermon Bentley presented a typology of all the topics from which evidence of God's existence and providence could be drawn. The first (the substance of sermons three, four and five) covered the living portions of the universe. These, Bentley says,

do the most clearly and cogently demonstrate to Philosophical Enquirers the necessary Self-existence, and Omnipotent Power, and unsearcheable Wisdom, and boundless Beneficence of their maker. This first Topic therefore was very fitly and divinely made use of by our Apostle in his Conference with Philosophers and that inquisitive People of *Athens*.¹²⁰

Paul's speech to the Athenians was, from oratorical necessity, more philosophical than his speech to the simple-minded Lycaonians.¹²¹ This needs emphasising in the light of the Newtonian interpretation of the sermons. Bentley states that the topic of

¹¹⁹ It was preached on October 3rd. and Bentley used, as his text, *Acts*, 14: 15 The full text reads, 'That ye should turn from these Vanities unto the living God, who made Heaven and Earth, and the Sea, and all Things that are therein: Who in Times past suffered all nations to walk in their own ways. Nevertheless, he left not himself without witness, in that he did Good, and gave us Rain from Heaven, and fruitful Seasons, filling our Hearts with Food and Gladness'.

¹²⁰ Letsome and Nicholl, *op. cit.*, i, p.52.

¹²¹ At *Acts* 14 ff., Paul preached to the Lycaonians.

the general frame of the universe has always been more popular and plausible to 'the illiterate Part of Mankind.' Even the Epicureans observed that it was

Men's contemplating the most ample Arch of the Firmament, the innumerable Multitude of the Stars, the regular Rising and Setting of the Sun, the periodical and constant Vicissitudes of Day and Night, the Seasons of the Year, and the other Affections of Meteors and heavenly Bodies, was the principle and almost only Ground and Occasion that the Notion of a god came first into the World.¹²²

Thus his own rhetorical positioning of it echoed the wisdom of Paul, who was likewise acting according to strict rhetorical principles when he chose this topic in his discourse to 'the rude and simple Semi-barbarians of *Lycaonia*.' St. Paul had therefore aptly disposed his material in conformity with the diverse nature of his auditory. Bentley further expressed his bewilderment at the fact that people are, in general, ready to turn to the 'immense Distance of the starry Heavens' than seek reasons for the Deity closer to home in their own bodies and minds.¹²³

The foundation for Bentley's strategy in these final Sermons was constructed from a series of conditional propositions on the nature of matter. Firstly, that it had not existed from all eternity; secondly, accepting that the atheist's deity was matter, he would prove that even if it was eternal, motion could not have co-existed eternally with it 'as an inherent Property and essential Attribute'; thirdly, even if the foregoing claims of the atheist were allowed to be true, Bentley insisted on the following proposition:

Particles or Atoms could never of themselves by omnifarious Kinds of Motion, whether fortuitous or Mechanical, have fallen or been disposed into this or a like visible System';

Fourthly, he showed from arguments '*a posteriori*', that the universe, with its 'Order and Beauty of the inanimate Parts of the World, the discernible Ends and the final Causes of them', was the product of an intelligent and benign agent.¹²⁴ The

¹²² *Ibid.*, p. 53.

¹²³ *Ibid.*, p. 53. The third topic, which Bentley promised to treat on another occasion, was to be found in what he called 'the Adjuncts and Circumstances of human Life'. This major division of the 'proofs' probably formed the basis of Bentley's second series of sermons which have never been located. Clarke divided his own performance in exactly the same way reserving his second year for the evidence from revelation and human testimony.

¹²⁴ *Ibid.*, p. 57. The fourth head - the subject of the eight Sermon - covered the design argument. The crucial point in Bentley's argument was that the world demonstrates a '*to Beltion*', a 'Meliority above what was necessary to be.' This 'reflex Argument', as Bentley called it, shows that the world is not *only* functionally designed, but also designed for the service and the pleasure of human beings: Bentley needed to emphasise this point, since he acknowledged that even atheists admit to

suppositional nature of the first three propositions gave rise to the controversy over the innateness of gravity: Newton either failed to see the conditional in Bentley's approach or thought the move too risky to allow the overall rhetorical strategy of Bentley's conditional propositions. The first two propositions were covered in the sixth Sermon: the seventh and eight dealt respectively with the third and fourth of the above propositions. Just as Bentley had shown in the previous Sermons that matter was insufficient for cogitation he began his defence of spirit by showing that matter was insufficient to form or maintain the present structure of the universe.

In the sixth Sermon Bentley presented Descartes' definition of matter - which identified material substance with extension or space - as the main weapon in the atheist's claim that matter was self-sufficient. Bentley charged Descartes with having made the idea of an eternal matter easily conceivable, since the imagination accepted without difficulty the notion that space cannot 'either begin or cease to exist'. Bentley's primary objective was to divorce matter and infinite extension by providing the imagination with the proper conception of matter. He argued, that while it was ludicrous to consider 'the Particles of this dead Ink and Paper have been necessarily eternal and uncreated', the concept of eternal space (if the notions of space and matter are co-extensive) was not ridiculous. The Cartesian notion of matter as extension had provided conceptual power to the atheistical imagination and easily insinuated the image of eternal matter. The precise nature of matter and its ontological distinctness from space was graphically portrayed by the insignificance of a single particle. Bentley promised to

prove . . . Body and Space or Distance are quite different Things, and that a Vacuity is interspersed among the Particles of Matter, and such a one as hath a vastly larger Extension than all the Matter of the Universe. Which now being supposed, they ought to abstract their Imagination from that false infinite Extension, and conceive one Particle of Matter, surrounded on all Sides with Vacuity, and contiguous to no other Body.¹²⁵

Having portrayed a solitary, 'sluggish and inactive' atom, Bentley posed the ridiculous question of whether matter can reasonably be said to possess a 'Necessity

the fitness of function and end.

¹²⁵ *Ibid.*, p. 61. Bentley probably had in mind the theologically dangerous concept of space prevalent in the works of the Cambridge Platonists. In the later correspondence between Samuel Clarke and Leibniz, the latter accused Newton of performing the same reification, and by implication the deification of space. These issues highlight the theological reaction, among certain Anglicans, to abstract notions, and why Epicurean atomism could - however ironic it may seem - assist in disposing of the dangers of Cartesian corpuscularianism.

of Existence'. Such an attribute was usually (that is theologically) reserved only for the highest of all perfections. Also if matter could not be eternal then neither could motion. Descartes had further sinned by providing 'metaphysical Arguments' which, Bentley claimed, argued for the infinite duration of the universe:

but that Assertion doth solely depend upon an absolute *Plenum*; which being refuted in my next Discourse, it will then appear how absurd and false that conceit is, about the same Quantity of Motion; how easily disproved from that Power in human souls to excite Motion when they please, and from the gradual Increase of Men and other Animals, and many Arguments besides.¹²⁶

The elimination of a plenum was a fundamental move in the acceptance of an atomic hypothesis based on individual particles and an immense vacuous space. It served to enhance the independent status of the immaterial, and once allied to a 'proper' conception of matter it materialised the Dominion of God and his operative power. Without having first insinuated into the imaginations of his audience the image of the solitary insignificant atom - as opposed to the Cartesian plenum - Bentley's subsequent deployment of the power of gravity would not have been so successful. Furthermore, his strategy in the seventh Sermon would not make sense without having first developed this 'true' picture of a matter particle. In the seventh Sermon the pictorial representation of the paucity of matter served to define the nature of a true 'chaos'.

Having reduced particles of matter to dead, inert solitary 'bits', his programme for the seventh Sermon might appear generous to atheists:

we should allow the Atheists, that Matter and Motion may have been from Everlasting; yet if (as they now suppose) there were once no Sun, nor Stars, nor Earth, nor Planets, but the Particles that now constitute them were diffused in the mundane Space in the Manner of a Chaos without any Concretion or Coalition; those dispersed Particles could never of themselves by any Kind of natural Motion, whether called Fortuitous or Mechanical, have convened into this present or any other like Frame of Heaven and Earth.¹²⁷

Before turning to the question of the chaos he dismissed the specifically Epicurean argument that the formation of bodies was due to 'Fortune' and 'Chance'. He referred to these terms as the 'ordinary Cant of illiterate and puny Atheists'. The terms were an indication of ignorance and not true 'things'. They possessed only

¹²⁶ *Ibid.*, p. 62.

¹²⁷ *Ibid.*, p. 63.

'relative Signification', standing for effects whose causes were not perceived by the agent. Thus the term 'Fortune' was only a word synonymous with 'Nature' and 'Necessity'.¹²⁸ Likewise he claimed that the term 'Chance' is recognised as a synonym for 'mechanically produced': the atoms are unaware of their subjection to the universal laws of motion and their coming together lacks thought. As neither Bentley nor the atheist wished to add consciousness to atoms there can be no dispute between them once the true notion of chance is understood. The matter was settled, to Bentley's satisfaction, once it was shown that the terms, 'Fortune', 'Chance', 'Nature', and Mechanism' all describe the same atheistical hypothesis.

Having peremptorily dismissed these problematic terms Bentley announced that it was now time, 'once for all', to 'overthrow all possible Explications which Atheists have or may assign for the formation of the World', with a 'Discourse about the Formation of the World'. He claimed that contemporary natural philosophy demonstrated that in the mechanical account, commonly accepted by both the atheist and the religious, the '*mechanical Affections*' of matter would be insufficient to produce a coherent universe. Bentley now turned to his creditable authorities for a definitive account of these lately discovered mechanical affections. Firstly, he introduced the phenomenon of 'gravity'; secondly he explained that weight is proportional to quantity of matter; thirdly, given the truth of the second proposition it necessarily followed, he argued, that there is a 'vacuum'; and lastly, he computed the quantity of matter in the universe relative to void space. This procedure was a prelude to the presentation of the 'right Conception and Imagination of a supposed *Chaos*.'

To appreciate Newton's role in the sermons it will be necessary to look at these four points in some detail. The first of these Bentley described as follows

The most considerable *Phenomenon* belonging to Terrestrial Bodies is the general Action of *Gravitation*, whereby all known Bodies in the Vicinity of the Earth do tend and press toward its Centre; not only such as are sensibly and evidently heavy, but even those that are comparatively the lightest, and even in their proper Place, and natural Elements; (as they usually speak) as Air gravitates even in Air, and Water in Water. This hath been demonstrated

¹²⁸ Bentley illustrated this point with the following example. Prior to the formation of the present world an intelligent agent, although intent on effecting particular arrangements, was ignorant of the true 'occult and unknown Motions and Tendencies in Matter, which mechanically formed the World besides his Design or Expectation'. This agent would no doubt refer to the outcome as the result of chance.

and experimentally proved beyond Contradiction, by several ingenious Persons of the present Age, but by none so perspicuously, and copiously, and accurately, as by the Honourable Founder of this Lecture in his incomparable Treatise of the *Air and Hydrostatics*.¹²⁹

Having experimentally demonstrated the existence of universal gravitation, Boyle and others, had shown it to be a 'constant Property' whereby the weight of all bodies near the surface of the Earth was 'ever proportional' to the quantities of their matter.

This we are told

is the ancient Doctrine of the *Epicurean* Physiology, then and since very probably indeed, but yet precariously asserted: But it is lately demonstrated and put beyond controversy by that very excellent and divine Theorist Mr. *Isaac Newton*, to whose most admirable Sagacity and Industry we shall frequently be obliged in this and the following Discourse.¹³⁰

Newton had succeeded in placing this Epicureanism 'beyond Controversy'. Atomism now became a weapon with which to defeat atheism: it also demonstrated that the ancient atomic philosophy was triumphant over the latter day version produced by Descartes, with its reliance on the possibility of an eternal matter and a conserved quantity of motion. Moreover, since weight is proportional to quantity of matter, a 'vacuum' had to be accepted - another 'principal Doctrine' of Epicurus.¹³¹ The use of Epicurean atomism against the *materia subtilis* of Descartes may be seen in the following passage:

If it be said, That. . . an aethereal subtile Matter, which is in a perpetual Motion, may penetrate and pervade the minutest and inmost Cavities of the closest bodies, and adapting itself to the figure of every pore, and may adequately fill them: and so prevent all Vacuity, without increasing the Weight: to this we answer, That that subtile Matter itself must be of the same Substance and Nature with all other Matter, and therefore it also must weigh proportionally to its Bulk.¹³²

Furthermore, Bentley had a *mathematical* demonstration that the proportion of

¹²⁹ *Ibid.*, p. 64. Notice the traditional account of the 'Elements' and 'place'. Bentley used Boyle's, *New Experiments physico-mechanical, touching the spring of the air, and its effects* . . . (Oxford, 1662), and *Hydrostatical Paradoxes, made out by New Experiments, (for the most part physical and easie)* (Oxford, 1666).

¹³⁰ *Ibid.*, p. 65. See Newton, *Principia*, Bk. iii, prop. 6. For an interesting discussion of Newton as the 'Epicurus' of the Moderns, see W. R. Albury, 'Halley's Ode on the *Principia* of Newton and the Epicurean Revival in England', *J. Hist. Ideas*, 39 (1978), 24 - 43. On Newton's active involvement with ancient thought, see J. E. McGuire and P. M. Rattansi, 'Newton and the "Pipes of pan"', *NRRS*, 21 (1966), 108 - 43. Compare Paolo Cassini, 'Newton: The Classical Scholia', *HS*, 12 (1984), 1 - 56.

¹³¹ The existence of a vacuum also contradicted the Cartesian conception of matter:

¹³² *Ibid.*, p. 65.

matter in the universe was tiny compared to void space. Thus the concept of a vacuum was deployed within Bentley's main programme of reducing the ontological significance of matter.

This mathematical demonstration was in effect a pictorial representation of a true chaos. To accomplish this he introduced Boyle's 'Trials' on refined gold. Although considered the most 'ponderous' of materials Boyle showed by experiments that gold is insoluble in '*Mercury and Aqua Regis, and other chymical Liquors*'. By using the relative specific weights of gold, water, and air, Bentley demonstrated that the density of gold to air is '16150 to 1.' From this he says it

clearly appears, seeing Matter and Gravity are always commensurate, that (though we should allow the Texture of Gold to be entirely close without any Vacuity) the ordinary Air in which we live and respire is of so thin a composition, that 16149 Parts of its dimensions are mere Emptiness and Nothing; and the remaining one only material and real substance.¹³³

If gold is allowed to be porous then the ratio is even higher. Moreover, this argument was only concerned with 'the lowest and densest Region of the Air near the surface of the Earth', where the mass of the atmosphere is under a 'violent Compression'. Thus Boyle's notion of the 'spring of the Air' further undermined the Cartesian notion of matter. Bentley explained that the atoms of air were, now known to consist of

elastic or springy Particles, that have a continual Tendency and Endeavour to expand and display themselves, and the Dimensions, to which they expand themselves, to be reciprocally as the Compression.¹³⁴

Therefore the further away from the Earth, the less the compression and the thinner the atmosphere. For example, at the distance of one 'Terrestrial Semidiameter' a sphere of air, one inch in diameter, would expand to 'the Thinness of the Aether' and would more than take up the 'vast Orb of *Saturn*', which is many 'Million Million Times' the size of the Earth. By means of further numerical computations Bentley showed that the 'Sum of empty Spaces within the Concave of the Firmament is 6860

¹³³ *Ibid.*, p. 65. The accuracy of Bentley's computations and the validity of his arguments are not relevant for the present discussion. The importance, for the historian, lies in his presentation of crucial elements of contemporary and ancient science to his audience, in order to weaken the position of matter relative to void space. All this was achieved without props, blackboard, or physical artefacts. See, Howard J Fisher, 'Faraday's two voices', *Physis*, 29 (1992), Nuova Serie, Fasc. 1, 165 - 186, for an insightful and comparable account of Faraday's rhetorical skill in presenting mathematical physics in images.

¹³⁴ Letsome and Nicholl, *op. cit.*, i, p. 66.

Million Million Million Times bigger than all Matter contained in it'.¹³⁵

This representation of the paucity of matter in the universe was necessary to destroy the common conception of a chaos, where a multitude of corpuscles formed a storm of matter, with neighbouring particles possibly forming chance combinations. Lucretius's account of the primordial chaos presented this image, as did Descartes' 'swirling vortices'. Bentley undermined this imagery and was thereby in a position to make the rhetorical masterstroke of the Sermons. Being now

enabled to form a right Conception and Imagination of the supposed *Chaos*, we may proceed to determine the Controversy with more Certainty and Satisfaction, Whether a World like the present could, without Divine Influence, be formed in it, or no?¹³⁶

His mathematical calculations indicated that any particle in the universe was situated 'nine Million Times [its] own Length from any other Particle.' Generating the conception of vast emptiness in the minds of his listeners he underlined the impossibility of any two particles ever meeting:

in the whole Surface of this void Sphere there can only twelve Particles be evenly placed . . . at equal Distances from the central one and from each other . . . the result and Issue would be, not only that every Atom would be many Million times its own Length distant from any other; but, if any one should be moved mechanically (without direction or Attraction) to the Limit of that Distance, it is above a Hundred Million Million Odds to an Unit, that it would not strike upon any other atom . . .¹³⁷

Accepting the doctrine of a primary chaos, favoured by the Epicurean, Bentley had turned that atheistical notion against his adversaries with his image of a 'true' chaos. This he had delivered by means of a 'brief Account of some of the most

¹³⁵ *Ibid.*, p. 66. These figures also agree with those which he sent to Newton. They are based on the figure of 7000 terrestrial diameters for the size of the *Orbis Magnus*, which, Bentley says, he took from Andreas Tacquet's work. Tacquet used this figure to calculate, by the doctrine of 'parallaxis', the size of the orb of the firmament. Tacquet's work was recommended to Bentley by John Craig, *via* Wotton, in June 1691, in the letter containing the horrendous reading list necessary to understand the *Principia*. The list included works by De Wit, Slusius, Barrow, Leibniz, Cavalerius, Galileo, Torricelli, Hobbes, Descartes, the Gregory brothers, Fabri, Archimedes, Borelli, and Wallis.

¹³⁶ *Ibid.*, p. 66. Without inculcating this image into the imaginations of his auditory, Bentley's subsequent argument would have lacked force: gravity could not be mechanical, and, therefore, its ability to pull together this paucity of matter into the present frame of the world required divine influence - would have lacked force

¹³⁷ *Ibid.*, p. 67. Bentley's metaphor of the ships on a vast ocean were ornamental pictures which would serve as graphic recapitulation of the calculations. Although Bentley and Newton were in dispute over whether the particles were at 'absolute Rest among themselves', and maintaining an exact 'mathematical evenness', this technical issue makes no difference to his rhetorical strategy in the Sermon.

principal and systematical *Phaenomena* that occur in the world now that it is formed' - the elasticity of the atmosphere and the power of attraction.¹³⁸ Bentley concluded that gravity, the power needed to bring together widely dispersed particles in an infinite vacuum, could only have a divine origin and was utterly reliant on the will of the deity.¹³⁹

Bentley's main rhetorical strategy in these latter sermons was to utilise the technique of 'energia', which provided the imagination with lively images. The insignificance of matter, the relative vastness of empty space as an arena for the power of God, and the necessity for an immaterial power operating within vacuity served to energise the imaginations of his audience. Furthermore, the authority of the Englishmen Harvey, Boyle and Newton had been asserted over the atheist-supporting French Cartesians.

Given the complexity of the foregoing arguments it is not surprising that Bentley was anxious to refute all possible mechanistic explanations. Hence his 'request' to Newton formed a list of 'queries' regarding the possibility of further 'natural' explanations which might account for the formation of our system.¹⁴⁰ In fact the surviving letter from Bentley to Newton contains six synopses of the main uses of natural philosophy that he had discussed in sermon Seven. It shows clearly that he understood the technicalities of the *Principia* and that he had made himself familiar with recent work on mechanics and astronomy. This letter also demonstrates that Newton was willing to learn from Bentley. For example, in his letter Bentley

¹³⁸ *Ibid.*, p. 64.

¹³⁹ Bentley reassured Newton that his use of the notion of gravity was in keeping with the claims of the *Principia*: 'all bodies gravitate toward All. This Universal Gravitation of Attraction is ye *to phaenomenon* or Matter of Fact. for ye demonstration of which I must referr you to [cites the *Principia*]. He then cited, for Newton's approval, his comments in the Sermon, '[i]ndeed as to the Cause and origin of this Gravity he [Newton] was pleased to determine nothing. But you will perceiv in the sequel of this Discourse, yt it is above all Mechanism or power of inanimate Matter, & must proceed from a higher principle and a divine energy & impression. [I have written these words at large, yt you may see if I am tender enough, how I engage your name in this Matter.]' In the published version of Bentley's Sermon the phrase 'pleased to determine nothing' was omitted. See Turnbull, *op. cit.*, iii, p. 247.

¹⁴⁰ Bentley made a similar request in a letter to Edward Bernard. He wrote, 'I am told by my Patrons, that hereafter all my discourses may be reprinted in 8vo: if this be, I must add a preface, &c.: and should be glad in the mean time to have your remarks upon each; of any mistakes I may have made, or any things obscurely, or imperfectly handled'. The request to Newton was also a set of queries, since Newton's replies constitute a methodical response to each of Bentley's points. See Wordsworth, *op. cit.*, i, p. 40.

concurr with Newton's claim that a 'Chaos is inconsistent with ye Hypothesis of innate Gravity', and adds the comment, 'tis inconceivable, yt inanimate brute matter should (without a divine impression) operate upon & affect other matter without mutual contact: as it must, if gravitation be essential and inherent in it'. In his final reply to Bentley, Newton says that he likes this view 'very well', and then repeats Bentley's remarks on the impossibility of brute matter acting without mutual contact. Thus, Newton accepted the necessity of something to mediate between particles. Bentley was more than willing to associate this mediator with the power of God, whereas Newton left it to his readers to decide on the materiality or immateriality of this agent: the rhetorical needs of Bentley outweighed the caution of Newton.

I have discussed Bentley's arguments and strategies at some length to show the ways in which natural philosophy functioned in the oratorical marshalling of evidence and proof in Bentley's case against materialism. The authority of contemporary 'Observation and Experiment' was brought to the bar to provide evidence against those who abused the doctrines of the ancients, particularly Epicurean atomism. He attacked the fundamentals of Descartes' natural philosophy in order to lay the foundations for true conceptions of chaos, matter, space and motion. Bentley's performance was therefore a contribution to the re-appropriation of ancient atomism by Christian philosophers who considered themselves the rightful custodians of the atomic hypothesis. Those who were instrumental in choosing Bentley, in particular Tenison and Stillingfleet, had already perceived the dangers in the growing authority of alternative natural philosophy - especially Cartesian. However, as Bentley explained, in the hands of the righteous the weapons of true natural philosophy could be used to explode false and inconsistent atheistic systems. I have shown the way in which Newton's *Principia* was utilised in that re-appropriation and that it was not the *raison d'être* driving Bentley's Boyle Sermons. Moreover, there was no personal relationship between Newton and Bentley until after Bentley had delivered his Sermons.¹⁴¹ Bentley's subsequent dealings with Newton regarding ventures such as the establishing of the Plumian professorship and observatory were driven by Bentley's desire for proprietorial control over the

¹⁴¹ Bentley in a letter to Evelyn, 21 October 1697, mentioned possible weekly meetings, at his house in St. James', with Wren, Locke, Newton, and hopefully Evelyn 'when in Town'. whether these meetings actually took place is not known. See, Wordsworth, *op. cit.*, i, p. 152.

bequest.¹⁴² The eventual success of Newton's work and its incorporation within later natural theology ought not to be used retrospectively to characterise Bentley's Sermons, which fitted a traditional genre - confuting irreligion by means of any strategy which ensured victory.

¹⁴² See, Ronald Gowing.. *Roger Cotes - Natural Philosopher* (Cambridge, 1983).

Chapter Five

John Harris and the Prosecution of Atheism

5. 1. Introduction: The Early Scholarly Network of John Harris

Harris's career has often been defined as leading to his eventual role as a Newtonian, his sermons being viewed as preparatory materials whose only importance lies in their eventual appearance in the second volume of his *Lexicon Technicum*, which contained Newton's essay 'De natura acidorum'.¹ However, in this opening section I shall show that this is not a helpful way of constructing his career but that we shall have to examine a range of other activities that constituted his career path. Subsequent sections of this chapter concentrate on Harris's role in the anti-atheist literature of the period, the style and content of his Sermons and the question of his Newtonianism.

There is an extreme paucity of materials, both primary and secondary, on Harris.² What is certain regarding his scholarly life is that he held a position within the community of learning and the credit which he accrued within that community allowed him to pursue a variety of ventures. Whilst it is relatively straightforward to deal with the substance of the Sermons, any attempt to account for Harris's early career and his selection by the Trustees must be conjectural. Even the important question of where Harris attended university has been incorrectly stated. In his *Alumni Cantabrigiensis* Venn confused John Harris of Leicestershire with Harris the

¹ *Lexicon Technicum: or, an Universal English Dictionary of Arts and Sciences, Explaining not only the Terms of Art, but the Arts themselves*. The first volume was published in 1704 and the second volume in 1710. For a general discussion of scientific encyclopaedias see Hughes, A. 'Science in English Encyclopaedias, 1704 - 1875', *Annals of Science*, 7 (1951), 340 - 70; 8(1952), 323 - 67.

² There are brief biographies in the *DNB* and in the *DSB*. The scant secondary sources all rely on the *DNB* article which in turn draws mainly on Venn's *Alumni Cantabrigiensis*. The only recent substantial paper on Harris is Geoffrey Bowles, 'John Harris and the Powers of Matter', *Ambix*, 22 (1975), 21 - 38. See D. McKie's 'John Harris and his *Lexicon Technicum*', *Endeavour*, 4 (1945), 53 - 7, for a useful, but somewhat whiggish, account of Harris's contribution to the history of Chemistry. The bulk of Harris's papers have been lost or destroyed, see below, p. 2, fn. 7, for details.

Boyle Lecturer who, he claimed, entered St. John's College, Cambridge in 1684. Harris, in fact, entered Trinity College, Oxford on 13 July 1683.³ This is confirmed by an incomplete autobiography included in H. E. D. Blakiston's *Trinity College* in which Harris writes of his undergraduate days.⁴ He proceeded BA in 1686 and MA in 1689. On leaving Oxford and after taking holy orders he was presented to the vicarage of Icklesham, Sussex. He was soon appointed (on 7 September 1690) to the living of Winchelsea, an adjacent parish, by a special order of the Bishop of Chichester.⁵ Harris held various ecclesiastical livings and was chaplain to and patronised by the powerful Sir William Cowper, Keeper of the Great Seal and Lord Chancellor. It was Cowper who obtained for Harris a prebendary seat in Rochester Cathedral along with the combined parishes of St. Mildred, Bread Street and St. Margaret Moses, London.⁶ Although there was no shortage of powerful patrons assisting Harris's career, he died improvident on 7 September 1719. Unfortunately the bulk of Harris's papers, which eventually passed into the hands of Edward Goddard, have not been located.⁷

According to his biographical reflections, Harris was interested in natural philosophy from early in his undergraduate days. The autobiographical fragment describes how Trinity College, then under the presidency of Ralph Bathurst, catered for those with an interest in the new experimental philosophy:

³ The *DNB* continues Venn's error but Robert H. Kargon, in his *DSB* article, corrects it.

⁴ H. E. D. Blakiston, *Trinity College* (Oxford, 1898) especially pp. 172 ff. according to Blakiston the extracts were communicated, by Edward Goddard, to Warton, for his life of Ralph Bathurst. Warton did not use these and the original manuscript has since been lost. See, Thomas Warton, *Life and Literary Remains of Ralph Bathurst &c.* (London, 1761). The reliability of Harris's reflections as an indicator of life at Trinity in the 1680s is not the issue. However, the extracts contain useful comments on Harris's early involvement with natural philosophy

⁵ The Bishop of Chichester was Simon Patrick who, in October 1689, succeeded John Lake. Patrick was translated to Ely on 2 July 1691 and his successor was Robert Grove. See LeNeve, *Fasti*, i, p. 252.

⁶ William Cowper became chancellor after the Act of Union in 1707. See G. Holmes, *British Politics in the Age of Anne* (revised ed., London, 1987). Simon Schaffer argues that the changes in the 1704 and 1710 volumes of Harris's *Lexicon Technicum* relate to the influence of Cowper's Whig policies on Harris. Simon Schaffer, 'Newtonian Cosmology and the Steady State', PhD thesis (University of Cambridge, 1980). For a concise statement of the Whig political influence on styles of natural philosophy, see Steven Shapin, 'Of Gods and Kings: Natural Philosophy and Politics in the Leibniz-Clarke Disputes', *Isis*, 72 (1981), 187 - 215.

⁷ Harris's papers passed into the hands of his friend and patron John Godfrey and from thence into the possession of Edward Goddard who had them in 1761, but Edward Hasted, in his history of Kent, says he could not locate them. See Edward Hasted, *The History and Topographical Survey of the County of Kent* (Canterbury, 4 vols., 1778 - 1799).

Lectures were here read in Experimental Philosophy and Chemistry, and a very tolerable course of Mathematicks taught: especially after Harris [refers to himself] took his first degree, for then the excellent President gave him leave to teach Mathematicks to such as were inclined to learn, wch he did, and showed them the practical and useful part, & how to apply it to business and the advantages of Life.⁸

He was tutored by Stephen Hunt who belonged to a chemistry society which first met in 1683 when 'the elaboratorie was quite finisht'.⁹ These early connections with scientific practice help to explain Harris's election to the Royal Society which took place on 29 April 1696.¹⁰ Moreover these connections with natural philosophy help to explain Harris's participation, at this time, in a controversy involving the natural historian John Woodward. The controversy concerned the Mosaic account of the Creation and the Flood, but it spilled over into other areas and was, in that it very often turned on arguments over proper 'method', a contribution to the ancients versus moderns debates. More than two decades later, in 1719, Harris again defended Woodward in a controversy over the remedy for smallpox. In this case Woodward accused his main antagonist, John Friend, of merely relying on Hippocrates - thereby aligning himself with the ancients. Shortly before this later incident Friend supported his associates at Christ Church, Oxford, against Bentley in the battle over the merits of the ancients, as opposed to the moderns.¹¹ It is

⁸ Blakiston, *op. cit.*, p. 173.

⁹ The reference to the 'elaboratorie' was taken, by Blakiston, from the antiquarian E. Wood. I have not been able to find any information (in *DNB*, *DSB*, or in Gunther's *Early Science at Oxford*) on Harris's tutor. Blakiston informs us that Hunt leaned to Catholicism and was subsequently expelled from the College in 1689 for not taking the BD degree, although he appealed on the grounds that he had taken the oaths, the subscriptions and the sacraments. See Blakiston, *op. cit.*, p. 174, fn. 1.

¹⁰ Harris was probably proposed by Woodward who had himself been proposed by Hooke. Michael Hunter, in *The Royal Society and Its Fellows* (2nd ed., Oxford, 1994), p. 47, describes Harris as being among the coterie of 'very active recruits' which included John Woodward (elected fellow in 1693). McKie reports that for a short time, Harris was Vice-president of the Society. He was also for a time a member of the Council, although none of the sources confirm this. One of the two Secretaries in 1710 was Sir Hans Sloane (Newton's successor as President) and a fervent opponent of both Harris and Woodward. According to Heilbron, Harris fell from grace when Woodward was defeated and removed from the Council in 1710. see J. L. Heilbron, *Physics at the Royal Society during Newton's Presidency* (Los Angeles, 1983).

¹¹ Woodward's life and controversies have been excellently documented in Joseph M. Levine's *Dr. Woodward's Shield: History, Science, and Satire in Augustan England* (Berkeley/Los Angeles/London, 1977). On the 'battle of the books' (Swift's satirical title for the ancients versus moderns debate) see, Levine, *The Battle of the Books: History and Literature in the Augustan Age* (Ithaca and London, 1991). Harris's defence of Woodward in 1719 was published as, *A Letter to the Faithful Triumverate* [J. Friend, R. Mead, and S. Cade] *in answer to that pretended to be written by Dr. Timothy Byfield: and showing reasons why Dr. Woodward should take no notice of it* (London, 1719).

necessary to look in some detail not so much at the substance of these controversies (which drew so many scholars into a highly polemical and vituperative literary war) but at Harris's involvement, and particularly at the literary *form* of his support for Woodward. Furthermore, the examination of Harris's role in the exchange establishes his immediate scholarly network at the time of his Boyle Sermons and provides a reason for his selection by the Trustees. We must also examine the range of disciplines involved in the controversy and the methods considered appropriate for their practice. More importantly, several of the protagonists were connected, either directly or indirectly, with the Boyle Lectureship.

The controversy was between John Woodward and certain naturalists who criticised his *An Essay Toward a Natural History of the Earth*.¹² In defending Woodward Harris gained the attention of Woodward's friends, in particular Thomas Tenison and also possibly John Evelyn and William Wooton.¹³ Joseph Levine, in his excellent portrayal of the controversy, draws attention to Woodward's skill in the fields of language, mathematics, antiquities and natural philosophy. Woodward had come to the attention of Dr. Peter Barwick, the King's physician, whilst serving as an apprentice to a linen draper in London. His appointment to the professorship of Physick at Gresham College in 1693 is evidence of early patronage. His skilful combination of antiquities, natural philosophy and languages was also shared by many scholars in this period. William Wooton, one of the most renowned young scholars of the time and a close friend of Evelyn and Bentley, was typical of this polymathic breed¹⁴. In 1694 Wooton demonstrated his scholarly competence with the publication of his *Reflections on Ancient and Modern Learning* which was an attack on Sir William Temple's *Essay upon Ancient and Modern Learning* (1690). In his defence of the moderns Wooton specifically commended the methods of the 'Greshamites'. Gresham College was now headed by Woodward and included several prominent members of the Royal Society. As Joseph Levine comments,

¹² John Woodward, *An Essay Towards a Natural History of the Earth* (London, 1695).

¹³ The role of Wooton is ambiguous as he was friendly with Tancred Robinson - Woodward's sworn enemy and the target of much of Harris's vituperation - and also on good terms with John Evelyn and Richard Bentley. This is yet another instance of how the boundaries of scholarly affiliation were fluid and depended very much on contingent circumstances.

¹⁴ Bentley, in defence of Wooton, produced his own contribution to the 'Battle of the Books'. See above, chapter two, for details of Bentley's contribution to the dispute.

this meant more than praising and pursuing the natural sciences, for even the Royal Society mingled philological and antiquarian matters with 'philosophy' in their meetings and Transactions, and there was hardly a member, not excepting Newton and Halley, who did not combine the two interests.¹⁵

The controversy, therefore, was not over the dangers of the new philosophy versus the merits of the ancient systems, as many of the scholars were involved in the study of both. Neither was it a case of two monolithic camps clearly divided over substantive and methodological approaches. Instead, many of the protagonists shifted allegiance according to changing interests or individual friendships. However, there was a noticeable change in attitude towards the status of the ancients and each side in these disputes utilised this change to accuse the other of using outmoded authorities in the production of texts which were condemned as 'fictional' or as romances. In their defence of modern learning, against the Oxford wits who defended the authority of the ancients, Wooton, Woodward and Bentley shared a range of scholarly interests which relied on a common methodology. They placed less emphasis on eloquence and style, the chief debt owed to the ancients, and more on the application of philological and experimental tools to the texts.¹⁶ The moderns emphasised collecting, annotating and cataloguing *via* observation of the things themselves rather than the reports and 'fables' of the ancient sources. Interestingly, it was this polarisation of the fictional and the 'real', or 'solid', which provided much of the vituperative language of anti-Cartesianism.¹⁷

Woodward's *Essay* appeared in 1695 and asserted its close association with the new philosophy. The work was self-consciously modern both in its methodology and in its criticism of a reliance on ancient sources, and displayed a strong emphasis on the need for contact with the artefacts, particularly fossil shells. Woodward also insisted that all hypotheses should be based on 'matters of fact'. He claimed that since his predecessors had given far too much deference to the ancients it was time to supplant the blind adherence to authorities by gathering numerous observations.

¹⁵ Levine, *Dr. Woodward's Shield*, p. 19.

¹⁶ Briefly, it enabled them to treat an ancient manuscript as they would a coin, a natural history specimen, a fossil, or a monument as sign-bearing artefacts which provided both historical and experimental evidence. Richard Kroll in *The Material Word* has a useful discussion on this point, see chapter five, ' "Living and Speaking Statues": Domesticating Epicurus', pp. 140 - 82.

¹⁷ See below, section 5. 4, for examples of this anti-Cartesianism.

Furthermore, his work was designed to support the Scriptural account of the Creation and particularly the Mosaic account of the Universal Deluge. His preferred hypothesis was that the Mosaic Flood had by means of 'gravity' deposited fossil remains in strata according to their density - the heaviest sinking to the bottom. This, he argued, was evident from observation of facts about the Earth's stratification. This vindication of the Mosaic account by means of modern methods and the new philosophy could not have gone unnoticed by divines anxious to counter those hypotheses which seemed to belie the Biblical account. For example, Blount in his *Oracles of Reason* claimed that modern theories of the formation of the Earth, such as Burnet's *Archaeologia*, contradicted the account in Genesis.¹⁸ Woodward's *Essay* was, as Levine says, 'both natural and providential at one and the same time'.¹⁹ Tenison, a close friend of Woodward's, may have seen in the latter's hypothesis an alternative to Burnet's which was too easily appropriated by the enemies of Christianity. However, many naturalists were not so receptive to Woodward's views.

Woodward had both overtly and by implication impugned the work of some of the most capable naturalists of his day. Many of his former associates found the style and manner of the *Essay* far too brash and assuming for one so young. Edward Lhwyd and John Ray both wished that Woodward had behaved less confidently. Consequently, Ray, Lhwyd, Martin Lister and Tancred Robinson (a cohort of very close friends), annoyed by this personal slight, became sceptical of his methods and conclusions. 'L. P' was the first to answer Woodward.²⁰ Harris replied to this

¹⁸ See Robert Jenkin, *The Reasonableness and Certainty of the Christian Religion* (London, 1698). Jenkin claimed, in his attack on Blount, that those 'who have too much Philosophy to have no religion, put dangerous Weapons into the Hands of those who have neither the one nor the other, and know not how to use them but to do mischief', p. xvi. He also criticised Blount for using Burnet's *Archaeologia Philosophicae*, in the service of atheism, and for failing to inform his readers that Burnet professed his allegiance to 'Revealed Religion', *ibid.*, p. xxix.

¹⁹ Levine, *op. cit.*, p. 34. Woodward's hypothesis may have been perceived as an alternative to the views of Burnet's *Sacred Theory of the Earth* (1684), which offered an explanation of the Deluge based on the Cartesian principles of matter and motion.

²⁰ This work, referred to by Harris as 'Two Essays from Oxford', attacked Woodward's views on 'the Creation, general Flood and the Peopling of the World'. Levine says 'it is tempting to ascribe the work because of its initials to Lister and Plot whose fossil theories had both been mocked by Dr. Woodward'. Woodward himself believed they were the work of Tancred Robinson. Robinson did admit to assisting the author. Levine concludes that Lister remains a 'likely candidate'. Levine also draws attention to the further insult which this group must have felt from Woodward's mockery, since Lister, Sloane, and Robinson were among his referees for election to the College of Physicians.

anonymous critic in an even more vituperative style - described by Levine as 'a combination of satire and geological learning borrowed from his master'.²¹ While Levine is mainly interested in the substantive content of Harris's *Remarks*, some of the more rhetorical aspects of Harris's reply will assist us in understanding the tactics of the sermons. Harris's opening tactic was to draw attention to the anonymity of this particular attack on Woodward. Anonymity, he informed the reader, is the sign of someone attempting to conceal the real message of the text: in this case, to undermine the Mosaic account of the Creation and Flood in the service of atheism. Harris located the text within the circle of freethinkers who used philosophy to undermine religion:

I found also that the Pamphlet was applauded by Men of loose Principles: such as make their small stack of Philosophy subservient to Scepticism, and Infidelity: and who are always pleased with one that will lend his helping hand, tho never so lamely, towards the Deprecating the Authority of the Sacred Writings.²²

This opening attack on the credibility of the author was to be repeated in Harris's Boyle Sermons as a foundational tactic in prosecuting the atheist. Harris also accused L. P. of adhering to 'some bad Cause' and having 'Sinister designs to propagate', describing this act of deception as the behaviour of a 'Lurking Author', and claiming that it was usually found in the supporters of the ancient 'Epicurean chronology', in particular the 'Mahometans' and the author of *The Oracles of Reason*.²³ In the Boyle Sermons, Harris also discussed the literary tactic of concealment. He maintained there could be no distinction between being an atheist surreptitiously and openly proclaiming atheism in print, or orally in public - the difference was due only to the need for duplicity and insincerity from fear of the authorities. Harris further insisted that it was necessary to read 'between the lines' of

See, Levine, *op. cit.*, pp. 37 ff.

²¹ Levine, *op. cit.*, p. 37. John Harris, *Remarks on some late papers, relating to the Universal Deluge: and to the Natural History of the Earth* (London, 1697). Harris described himself on the title page as 'Fellow of the Royal Society'.

²² *Remarks*, 'Preface', p. A2.

²³ Blount was an obvious target for divines especially following the publication of his posthumous *Miscellaneous Works* (1695). These were edited by Charles Gilden who appended his 'Defence of Suicide' to the Preface - Blount died from a wound inflicted by his own hand after his sister in law refused to marry him. Blount's political views also caused grave concern as he claimed that William was King by right of conquest. Charles Leslie described Blount as 'the execrable Charles Blount', see *Short and Easie Method with the Deists* (London, 1696).

purported philosophical texts in order to uncover true authorial intentions. Repeating this point in the Sermons, he insisting that '*Deism and natural Religion*' were nothing more than disguised atheism:

*such are Atheists, who deny God's Providence, or who restrain it in some Particulars, and exclude it in Reference to others, as well as those who directly deny the Existence of a Deity: And Vaninus calls Tully Atheist, on this very Account; and in another Place, he saith, That to deny a Providence, is the same Thing as to deny a God.*²⁴

This excursus on how to detect atheism was necessary, otherwise the confrontation with atheistical philosophy was a mere *flatus vocis*. In the Sermons, Harris cited various authors in opposition to those who claimed never to have encountered such a character, and that all the noise and clamour is '*against Castles in the Air*'. He insisted that the proofs for the reality of atheists can be found both in the ancients and in the moderns. Plato, Diogenes Laertius, Plutarch, Cicero, and many others throughout history have all damned the atheist and accepted his existence.²⁵ We should note that Harris constantly made use of the ancients as 'authorities' and actually has a discussion in the sermons regarding the appropriate use of authorities as described in Aristotle's *Topics*.²⁶ In the category of deceitful philosophers Harris placed Hobbes, Spinoza, Blount, Sextus Empiricus and Vanini. For example, the deceit of Hobbes lay in his acceptance of the existence of a deity - this Harris says is the most dangerous of all, much more dangerous than the teachings of a professed atheist.

Professed Atheists can do no great Harm; for all Persons are aware of them, and will justly abhor the Writings and Conversation of Men that say boldly there is no God: But there are but few such; they have found a Way to pass

²⁴ Letsome & Nicholl, *op cit.*, i, p. 367. Bentley made the same conflation and many of the lecturers continued to adopt it. Gastrell, for example, says, 'For *Atheism* is to be considered as a *Vice*, and not a *mere Error in Speculation*. And, Therefore, he that denies *Providence, natural Law, or a future State*, is as much an *Atheist* as he that denies *God's Being*'. See, *ibid.*, i, p. 351.

²⁵ *Ibid.*, pp. 365 - 66. Harris uses the specific 'testimony' of two authors. Sextus Empiricus provided a list of ancient atheists. The 'modern' French author of 'Thoughts on the Comet that appeared in 1680', under the title *Pensee diverses Ecrites à un Docteur de Sorbonne à l'Occasion de la Comète qui parut au Mois de Decembre* (Rotterdam, 1680), adds contemporary names to the ancient lists. Blount's *Anima Mundi* (1679), described how the Epicureans constantly denied the existence of the Gods. Vanini speaks frequently of meetings with atheists and designated Maciavelli as '*Atheorum facile Princeps*'.

²⁶ Letsome and Nicholl, *op. cit.*, i, p. 384 - 5. Harris relied on the authority of Aristotle's *Topics*, to argue that assent ought to be proportional to the authority of those who assert a truth. As the belief in a deity has been the universal agreement of all mankind in all ages it passes for the highest degree of truth. This also afforded Harris another opportunity to ridicule the pride and vanity of the atheist in opposing such well established verities.

undiscovered under a fairer Dress and a softer Name: They pretend to be true *Deists* and *sincere Cultivators* of natural Religion; and to have a *most profound Respect for the Supreme and Almighty Being*.²⁷

By locating L. P. in the same category as notorious exponents of anti-Christian principles, Harris sought to undermine the discursive credibility of this author.²⁸ In fact he carried the strategy to absurd lengths. He accused L. P. of preventing the progress of a larger work promised by Woodward, and subtly conflated the future 'authoritative' status of this promised work with the 'authority of the Sacred Writings'. He contrasted the 'weakness and manner of such Pretensions to Reason and Philosophy as oppose things Divine and Sacred' with Woodward's projected work, which would be

qualified [sic] to propagate True Philosophy (which was the design of it) and at the same time to support the Authority of the Sacred Writings.²⁹

Moreover, in protecting his patron from the charge of plagiarism, Harris went through every author from which Woodward purportedly gathered his materials, demonstrating that there was no debt either to ancient or modern philosophers³⁰

Harris's reply to L. P. was typical of the style of literary exchange in this period.³¹ This method of attacking the credentials of 'awkward Pretenders to Philosophy' was a crucial strategy in his later Boyle Sermons. He also employed a standard trope, which highlighted the difference between his own support of natural philosophy and 'vain' philosophy, by describing his opponent's views as 'fictional' -

²⁷ Letsome and Nicholl. *op. cit.*, i, p. 408

²⁸ Harris puns on the title of Blount's work, and refers to the 'Oracles of 'Pretended' Reason'. The terms 'pretended' and 'vain' signify the same misuse of human learning.

²⁹ *Remarks*, 'Preface', A5.

³⁰ This took place in a separate essay, published with the *Remarks*, where Harris replied to a Mr. Robinson (no relation to Tancred Robinson) a country parson, who was charged by Harris as being a dupe and a mere mouthpiece for Tancred Robinson and Sloane. Harris viciously undermined the philosophical competence of the author and it is worth quoting some of his remarks to illustrate the style of the controversy. 'And first, Sir, I would have you, before you write another Book, endeavour to understand something of the Subject you treat about: Which the World will never believe you do, till you can write intelligibly, and will condescend to strip your self of that clumsy Veil of Mystery, and Darkness, which you now are wholly wrap'd in', *Remarks*, p. 153. The sartorial metaphor was to reappear again in Harris's attack on atheism in his Boyle Sermons.

³¹ Furthermore, Harris, regarded his book as a summary of the controversy, and, therefore, an attractive proposition to a bookseller. He considered 'that it might not be unacceptable to the Curious to meet here in so little a Room the Chief Heads or substance of what hath been advanced in these very entertaining and important subjects'.

having no more philosophical merit than the fables and parables of Don Quixote.³² L. P.'s particular vanity was his insinuation that the 'fable' of the Mosaic account appealed to a rude and vulgar audience.

In the beginning of this, L. P. Endeavours to invalidate *the Truth of the Sacred History* of the whole *Bible*, by silyly [sic] insinuating *that a mixture of Fable* was always inserted into the *Oriental Writings*; and particularly those of the *Hebrews*, to sweeten, forsooth, *and to allure the minds of Men, naturally Superstitious and Credulous*.³³

Thus L. P.'s 'vain' philosophy undermined the literal truth of Scripture.

Harris's rhetorical skill and his ability to manage a controversy in the defence of Sacred Scripture would not have gone unnoticed by Tenison or Evelyn in their search for a competent champion to fulfil Boyle's brief. Harris had defended Woodward in spite of the fact that many renowned naturalists were opposed to the latter's philosophical hypotheses. I suggest that Harris's defence of Woodward resulted from his perception of the possible avenues to preferment.³⁴ It provided the opportunity to publish a work guaranteed to appeal to booksellers and readers alike which would also display his usefulness in agonistic situations. Moreover, it offered an entrée into the circle of divines who supported Woodward - particularly the Archbishop of Canterbury, Thomas Tenison. Although Ray and Lhywd were critical of the merits of Woodward's natural history, they would not have sanctioned L. P.'s anti-Scriptural position.. What is significant about his role in the Woodward controversy is that he applied the methodology of the moderns in caricaturing the atheist as foolish in supporting the ancients. Especially in the light of the 'Greshamites' and the Royal Society's criticisms of ancient natural knowledge.

I have approached the fundamental question of Harris's selection by tracing the scholarly links which bound him to Woodward and thence to Tenison.³⁵ Edward

³² Cervantes was a favourite locus for this kind of accusation. Sterne actually coined the term 'cervantick tone'. See Laurence Sterne, *The Life and Opinions of Tristram Shandy, Gentleman*, vol. 1, chap. 12, eds. Mclvyn New and Joan New (3 vols., Florida, 1984).

³³ *Op cit.*, p. 61.

³⁴ Harris's ability to support those who might further his career will receive further examination in discussing the question of his Newtonianism.

³⁵ William Nicolson in his 'London Diaries' refers to an evening spent with Woodward and relates how "[i]n the evening Dr. Woodward, reflecting on the freedom taken by his friend Harris, whom he represents now as a forward Scribbler not to be imitated". This comment may indicate that relations between Woodward and Harris soured. There are many references to Harris in Nicolson's diaries and many references to the links between Tenison and the group of churchmen, including Wooton, Woodward, Bentley *et. al.*, all involved in natural history, antiquities and philological studies. Both

Lhwyd described Tension as Woodward's 'great friend'. Lhwyd was sure that Woodward retained his influence with the clergy even though many naturalists were antagonistic to him. The breakdown of friendship between Lhwyd and Woodward caused the former concern, because he feared he would lose the patronage he sought if he could not retain Woodward's good will. Tancred Robinson was, therefore, quite wrong to suggest that there were very few to support Woodward. Lhwyd remarked on how

The Archbishop of Canterbury [Tenison] is, I know, his great friend and so are most of the bishops and other very great men. When he was at Cambridge with us, he met with very honourable entertainment at the Vice chancellor's hands and others, the great men of the university.³⁶

Woodward was also awarded a doctorate in medicine (a 'Lambeth degree') by Tenison in February 1695, and this was confirmed by another at Cambridge six months later.³⁷ Harris's defence of Woodward provides a possible link with Tenison, especially as the Archbishop was so concerned to patronise scholarly divines.³⁸ Furthermore, in 1696, the Boyle lecturer William Whiston published his *New Theory of the Earth*. Whiston claimed that his theory of the Creation and the Flood was inspired by Woodward's *Essay*.

By this time Tenison had almost sole control over the choice of suitable Boyle lecturers.³⁹ It was unlikely that Ashurst played any role in Harris's selection and

Harris and Nicolson were to become very close to the Hanoverian Royal family. See, Clyve Jones and Geoffrey Holmes, eds., *The London Diaries of William Nicolson, bishop of Carlisle, 1702 - 1718* (Oxford, 1985).

³⁶ Levine, *op. cit.* p. 38. On Edward Lhwyd [the modern spelling is 'Lhuyd'] see, Frank Vivian Emery, *Edward Lhuyd F. R. S., 1660 - 1709* (Caerdydd, 1971). See, R. W. T. Gunther, *Further Correspondence of John Ray* (London, 1928), pp. 270 - 71, for Ray's complaints about the rough treatment he received at the hands of Woodward and Harris. In this letter to Edward Lhwyd, Ray comments 'Dr. Arbuthnot hath sufficiently exposed his [Woodward's] Hypothesis in generall [sic], in a few words: and one Mr. Kcill of Oxford is taking him & Mr. Whiston & Dr. Burnet in hand, as Dr. Robinson informs me'. Ray often mentioned the antagonism, on the part of naturalists, to Woodward's hypothesis.

³⁷ Levine, *op. cit.*, p. 31. He was very soon elected to the College of Physicians and was in the process of developing a thriving medical practice.

³⁸ Whiston in his *Memoires* (3 vols., London, 1749) recalled how he showed the manuscript to Bentley and Wren. However, he maintained that the work was put 'chiefly before Sir Isaac Newton himself, on whose Principles it depended, and who well approved of it'. This was written long after the event, and if it is true, then it raises the further issue of why Whiston - in his Boyle Sermons - made no reference either to Newton, or to the *Principia*. The *New Theory of the Earth* was used in the Sermons, see Letsome and Nicholl, *op. cit.*, ii, p. 295.

³⁹ See Wordsworth, *op. cit.*, p. 131 - 32. Evelyn to Bentley, Jan 12 1697, where Evelyn expresses his surprise 'to find in a newspaper one to succeed Dr. Williams in the Boylean Lecture, whose name I had not heard before'. Evelyn had given his proxy to Tenison, and was commiserating with Bentley

Rotherham was already dead. That Harris was chosen after Rotherham's death may have some significance since Rotherham had insisted on selecting his own candidate (Richard Kidder) in place of Bentley for the 1693 Sermons.⁴⁰ If we consider the substance of the Sermons between 1692, when Bentley delivered them, and 1698 we see that two of the five lecturers (Kidder and Williams) derived their materials from traditional sources whereas Bentley, Gastrell and Harris drew mainly on modern sources.⁴¹ Moreover, the style and content of Harris's sermons was typical of the genre established by Stillingfleet, Tenison, Tillotson, Matthew Hale, and other Anglicans which sought to appropriate the new philosophy as a necessary weapon in the defence of Christianity.

This discussion goes some way towards removing the selection of Harris from the context of 'Newtonianism' and instead placing it within a more appropriate context where scholarly performance enhanced credibility. There was nothing in Boyle's brief specifying the credentials of the chosen divine except a generalised notion of competence. There are no guidelines in the codicil which stipulated cognitive materials. Harris's performance was typical of a style of scholarship which combined a range of modern scholarly practices including history, antiquities and natural philosophy.⁴² Tenison and Evelyn would have approved of such practices and seen no obstacle to their deployment in carrying out Boyle's wishes. However, it would be utterly gratuitous to infer from the practices of specific groups the presence of a distinctive Anglican programme.

Having offered a plausible account of Harris's location in the 'Republic of

over his failure to be reappointed as Lecturer.

⁴⁰ Kidder was appointed bishop of Bath and Wells on the removal of the Non-Juror Thomas Ken. His Boyle Sermons, delivered in 1693, were based upon a work begun in 1684, *Demonstration of the Messiah*, which was not completed until 1700. The work was intended to promote the conversion of the Jews, where his vast knowledge of Hebrew and oriental languages were invaluable resources. Williams was consecrated Bishop of Chichester in 1696 (the second year of his Boyle Sermons). His Sermons argued for the necessity of Revelation and the certainty of Scripture. See, Letsome and Nicholl, *op. cit.*, i, pp. 89 - 152.

⁴¹ However, his specific uses of Locke and Descartes do not imply wholehearted support for their views, only a utilisation of certain of their principles in opposition to the atheist's reliance on the ancients.

⁴² See, Alan Cromartie, *Sir Matthew Hale, 1609 - 1676: Law, Religion and Natural Philosophy* (Cambridge, 1995). Matthew Hale is an excellent example of someone who covered so many disciplines - natural philosophy, theology and of course law.

Letters' we are in a much better position to characterise his Boyle sermons.⁴³ They were the result of Harris's desire to present himself as a competent critic and prosecutor of unacceptable views. The way in which Harris has been portrayed by Bowles and others ignores the extent to which his career was defined by his various literary activities. His search for patronage drew him into the Woodward controversy which led him to the notice of the Trustees. His subsequent career in the post-Lectureship years shows Harris paying little or no attention to the problems of anti-Christian material as so many other ventures offered the security and success he sought. He certainly secured financial backers in the marketplace of book-selling and achieved quite a successful literary career.⁴⁴

Larry Stewart introduces us to another side of John Harris - his role in setting up insurance companies and several mining ventures:

He was probably the John Harris, clerk, who appears among the list of clergymen who were trustees in the Society of Assurance for Widows and Orphans in 1699. More certainly, Harris was among the petitioners for the Amicable Society in 1706. Here he was in important company with William Lloyd, John Stillingfleet, White Kennet, as well as Captain Thomas Savery, a Joseph Watts, and Charles Cox, the brewer who originally employed Harris in lectures at the Marine Coffee House. The Amicable Society was formed shortly before Charles Povey's project, which soon led to the Sun Fire Office and Harris's involvement there in 1710.⁴⁵

These examples illustrate Harris's pursuit of security within an expanded arena of activities, where scholars could purvey their talents.⁴⁶ Scholarship was credit and the application of this talent was not limited to a specific sphere nor was it contained within fixed groups. Individuals changed positions and allegiances as often as they changed their interests or their friends.⁴⁷ However, positions within debates

⁴³ . Anne Goldgar, *Impolite Learning: Conduct and Community in the Republic of Letters 1680 - 1750* (New Haven/London, 1995). Goldgar's work, although situated mainly in the French literary community is an excellent source for material on the scholarly and social dynamics of the Republic of Letters. The Introduction is especially useful.

⁴⁴ Harris also produced travel literature, an astronomical dialogue modelled on Fontenelle's work, and a history of Kent. For a fine discussion of the relationship between book-selling and natural philosophy in this period see Adrian Johns, 'Wisdom in the Concourse: Natural Philosophy and the History of the Book in Early Modern England', PhD thesis (University of Cambridge, 1992).

⁴⁵ See Stewart, *Rise of Public Science* (Cambridge, 1992), p. 137. For a more detailed discussion of insurance companies and their links with the Church in this period, see Richard Grassby, *The Business Community of Seventeenth-Century England* (Cambridge, 1995).

⁴⁶ Although Harris did not lack for suitable patronage, many of the other lecturers were professionally more secure.

⁴⁷ The variation in allegiances among the coterie of Wootton, Harris, Lhwyd, Ray *et al.* is

were not infinitely fluid and thus the choice of materials deployed in any specific argument was the result of immediate allegiances. The driving force behind each performance was the need for victory and the need to be deemed by one's peers to have been successful.

This suggests that specific local factors were operating in determining what kind of literary production would prove most advantageous in the pursuit of patronage. Although it was the duty of divines to produce literary defences against the irreligious, these texts were also an opportunity to display scholarly talent and to attract further patronage. Harris's Boyle Sermons serve to illustrate this point. In the following section Harris's performance will be examined in the light of recent literature on contemporary responses to atheism. Having considered various alternative accounts on the issue of atheism, I shall deal, in a separate section, with selected substantive issues from the sermons in order to document my suggestions on how to characterise Harris's response to atheism.

5. 2. Harris's Position in the Anti-atheist Literature.

In late seventeenth-century England atheism was a crime, and therefore subject to continual scrutiny and prosecution.⁴⁸ The self-assuredness of many of the protagonists in the orthodox camp stemmed from their perception that they operated from the standpoint of righteousness against a scandalous and unscrupulous foe. Ecclesiastical, moral, and professional discourses, of Law, Divinity, and even Medicine, all contributed to the provision for a machinery of prosecution. The notion of a 'machinery of prosecution' is helpful once it is realised that analysing anti-atheist texts is not simply a matter of observing whether the various propositions succeed in arguments. In line with Foucault's concept of power-knowledge the orthodox began from a position of power, and the discourses available to them have their authority located in the mechanisms of power and control.⁴⁹ In such cases control and

staggering. Levine, *op. cit.*, (*passim*), provides highly detailed - and entertaining - accounts of the comings and goings within the scholarly networks of the Royal Society. Heilbron *op. cit.*, is also useful.

⁴⁸ Harris's Sermons provide an insight into orthodox responses to atheism. For a detailed discussion of the trial and punishment of an individual atheist see, Michael Hunter, ' "Aikenhead the Atheist": The Context and Consequences of Articulate Irreligion in the Late Seventeenth Century', in Michael Hunter and David Wooton, eds., *Atheism from the Reformation to the Enlightenment* (Oxford, 1992), pp. 221 - 54.

⁴⁹ See, Michel Foucault, *Discipline and Punish: The Birth of the Prison*, translated from the French

confinement were not only matters of cognitive proof. Since atheism was the consequence of disorder it was also necessary to establish the causes of the dysfunction and these were often located within the *person*. However, there was still the discursive need to apply systems of knowledge as a means of containing and controlling aberrant behaviour. As a helpful analogy we might consider Mary Douglas's analysis of taboo in her *Purity and Danger*. Douglas defines 'dirt' as essentially disorder: 'Dirt offends against order. Eliminating it is not a negative movement, but a positive effort to organise the environment.'⁵⁰ She also argues how confrontation with 'danger-beliefs' involves a language strong on mutual exhortation even to the extent of appealing to nature in order to sanction moral codes:

this kind of disease is caused by adultery, that by incest; this meteorological disaster is the effect of political disloyalty, that the effect of impiety. The whole universe is harnessed to men's attempts to force one another into good citizenship.⁵¹

That atheism was considered to be a dangerous contagion is supported by much evidence.⁵² Unfortunately the study of tactics appropriate to dealing with such a danger have often been side-stepped by scholars of atheism, who have focused attention on the causes of the rise of atheism and secularisation. Thus much of the literature on atheism has concerned itself with questions such as the existence/non-existence of the atheist; taxonomies of unbelief; the precise roles of individuals

by Alan Sheridan (Harmondsworth, 1991), pp. 19 ff., for a discussion on the links between punishment and discourse: *idem.*, *Power Knowledge: Selected Interviews and Other Writings*, ed., Colin Gordon (New York, 1980).

⁵⁰ Mary Douglas, *Purity and Danger: An Analysis of Concepts of Pollution and Taboo* (London, 1966). See Geoffrey Cantor, who discusses the concept of atheism as chaos and disorder, in 'The Language of Natural Theology', forthcoming. I would like to thank the author for permission to cite this paper prior to publication.

⁵¹ Douglas, *op. cit.*, p. 12. There are many examples of blaming disaster on the presence of the irreligious: these included the civil war, the Great Fire of London and the Lisbon earthquake, etc. For a general discussion of the prosecution of irreligion see, John Addy, *Sin and Society in the Seventeenth Century* (New York, 1989). John Spurr, *The Restoration Church of England, 1686 - 1689* (New Haven/London, 1991), provides detailed examples of the constant reiteration on the part of divines that England was a sinful nation and atheism was the consequence.

⁵² For example, Simon Patrick blamed the Plague on the profane behaviour of the irreligious, see *The Works of Symon [sic] Patrick, D. D. Sometime Bishop of Ely. Including his Autobiography*, ed., Alexander Taylor (9 vols., Oxford, 1858) ix, 584 - 85. Terms such as 'malady' and 'disorder' were frequently applied to the condition of spreading atheism. William Saywell, described it as 'an epidemical distemper that has infected all sorts of men, as well knowing as ignorant, orthodox and schismatical, see *A Serious Inquiry into the Means of a Happy Unison: or, what Reform is Necessary to prevent Popery* (London, 1681) quoted in Spurr, *op. cit.*, pp. 270 ff. See, Howard Jones, *The Epicurean Tradition* (London/New York, 1989) for an extended discussion on the representation, throughout the Christian era, of Epicurus in terms of filth and degeneracy.

responsible for the growth and spread of anti-clerical clandestine movements, and the merits of philosophical propositions for, or against, the existence of God. Such foci, while valuable, need to be supplemented by examining the intricacies of texts such as Harris's Sermons. This is especially necessary if we are to avoid a hermeneutics very often governed by categories which are only applicable to highly secularised contexts.

There are very few studies which concentrate on the manner in which orthodox divines responded to atheism. Harris, for example, may never have encountered a single atheist, yet a central theme of his Sermons recounted the process by which an individual descends into atheism. For the purposes of this thesis the actual presence of real atheists is irrelevant as are the merits or demerits of individual propositions regarding the existence of the Deity. The discursive machinery controlling the spread of disorganisation and chaos had only to be set in motion in order to produce results. Divines inherited this machinery along with its supporting discourse which were constantly under revision in the light of new threats from knowledge not yet within the control of that machinery. However, the incorporation, and authoritative acceptance, of novel materials within traditional *scientia* was a highly complex affair. Intranicene conflicts were often generated by differences over whether it was more effective to appropriate, or to denigrate potentially dangerous knowledge. Harris solved some of these tensions by appropriating the philosophical principles and denigrating the person. Thus regardless of the existence of atheists, the narrative structure of his Sermons required their construction. The dangerous presence of such real individuals - the existence of the crime and the criminal - presented Harris with an opportunity to apply the strategies of forensic rhetoric in order to produce a prosecutory performance. Furthermore, it was customary to use part of the performance to argue for the existence of atheists, against sceptics who claimed they were no more than the literary fictions of ambitious divines. It was also more oratorically satisfying for the audience to witness the denunciation of the scandalous behaviour of a real villain. The narrative tropes of order, chaos, disease and sin were already prevalent as aspects of the ontology of the Fall and Redemption - atheism was therefore not only a social and moral problem but a verification of the inherently dysfunctional essence of mankind.

As discussed above, in chapter one, the approach to the problem taken here is

best described as 'rhetorical'. This approach allows us to concentrate on the suasive nature of the Sermons where the locus of persuasion was not simply the arguments and propositions of the interlocutors. Neither are we concerned to 'expose' the underlying strategies as covert tricks. More specifically, the strategies of denigration were not concealed but appeared on the surface of the text, comprising the *matter* and not simply the *manner* of dealing with the irreligious.⁵³ Harris's Sermons located the causes of atheism outside the arena of rational behaviour. This move enhanced the juridical tenor of his performance, since he placed *both* the cognitive and the moral behaviour of the atheist beyond the possibility of discursive exchange. Harris was simply availing of a cultural commonplace. Even with the introduction of the Toleration Act and changes to the publishing acts, divines continued to depict the irreligious as the bearers of moral chaos.

If we therefore accept the view that the form of persuasion cannot be divorced from the content and that the form finds its legitimacy in inherited sanctions, can we say that we are witnessing the operation of 'power/knowledge' in anti-atheist texts? The answer to this question highlights a problem in the standard characterisation of 'natural theology'. It is necessary to examine this problem as the use of natural philosophy in prosecuting the atheist has unhelpfully been treated, without qualification, as an example of natural theology.⁵⁴ However, Geoffrey Cantor argues for the need to allow a distinct 'narrative space' for this genre in which its language and tactics (rhetoric) could be explored.⁵⁵ This would serve to shift attention away from the purely propositional focus of much of the work on natural theology and onto the way in which these texts appeal to faculties other than the

⁵³ The terms 'manner' and 'matter' are used in the rhetorical senses of style and substance. See Ronald H Carpenter, *History as Rhetoric: Style, Narrative, and Persuasion* (Columbia, 1995) especially his 'Introduction' where he argues that the manner of presentation can contribute to the meaning of what he calls 'ideational' material, that is the substance of a discourse. The terms 'form' and 'content' have been generally used by historians of science to signify the same distinction. For a general discussion of style in theological texts, see Isabel Rivers, *Reason, Grace and Sentiment: A Study of the Language of Religion and Ethics in England, 1660 - 1780* (Cambridge, 1991).

⁵⁴ For examples of treating polemical texts as natural theology, see Robin Attfield, 'Christian Attitudes to Nature', *J. Hist. Ideas*, 44 (1983), 369-86; John Gascoigne, 'From Bentley to the Victorians: the Rise and Fall of Newtonian Natural Theology', *Science in Context*, 2 (1988), 219 - 256; N. C. Gillespie, 'Natural History, Natural Theology, and Social Order: John Ray and the 'Newtonian Ideology'', *Journal of the History of Biology*, 20 (1987), 1 - 50.

⁵⁵ Cantor, *op cit.*

rational. Thus in the light of these suggestions it may be possible to approach this *genre* in terms of its juridical function - the prosecution of the irreligious was most definitely a rhetorical activity. It would also serve to shift attention away from the concentration on natural theology which so often has defined the analysis of these Sermons by historians. There may be more analytical gain from treating natural theology as an appeal to nature-acting-as-a-witness for the defence, rather than the theological equivalent of unproblematic experimentally derived propositions. By focusing mainly on the rhetorical nature of propositions regarding the status of the natural world, Cantor attempts to expose the theologian's use of non-cognitive tactics, such as analogy, metaphor and devices normally related to narrative fiction. He also draws attention to a prevalent trope of the opposing principles of light and dark, that served to define the ontological status of the material world, where the orthodox protagonists argued for 'order' and 'light' in opposition to the materialist emphasis on 'darkness' and 'chaos'.⁵⁶ The tropes of 'order' and 'disorder' were always available to theologians who drew materials from acceptable and sanctioned commonplaces. It was customary to use it to undermine the credibility of those charged with atheism, by exposing the desire for disorder purportedly inherent in all attacks on religion.⁵⁷ The language of disorder, chaos, impurity, filth, and disease is present throughout the whole history of Christian polemics. Epicureanism, or more specifically the person of Epicurus, was constantly vilified in terms of impurity and filth.⁵⁸ Thus the appeal to nature, as another witness, was only possible within a

⁵⁶ Bentley for example made great use of the concept of a chaos. It has been shown in Chapter Four above, how he sought to present a true conception of the original chaos mentioned in Genesis in opposition to the Epicurean notion of a chaos of atoms.

⁵⁷ Michael Hunter, *op. cit.*, p. 253. Hunter concludes that the reason for the severity of the sentence (death by strangulation) against Aikenhead was 'the continuum' between his philosophical eclecticism and his 'gibes at Christianity'. It is difficult for us, Hunter suggests to appreciate the significance which the orthodox attached to blasphemy and the threat from those who argued, as Aikenhead did, that Christianity in 'some hundreds of years' would be 'wholly ruined' and the world converted to atheism. Hunter concludes that legally and institutionally the Scottish authorities were 'arguably right' in their juridical response to atheism

⁵⁸ Epicurus was known as *patronus voluptas* and along with Mohammed was constantly vilified in personal terms particularly relating to filth, sex, gluttony and murder.. See, C. T. Harrison, 'The Ancient Atomists and the English Literature of the Seventeenth Century' *Harvard Studies in Classical Philology*. 45 (1934), 1 - 79, on the disapproval of the impieties of Epicurus and Lucretius. Roestvig has argued that this situation changed dramatically after the Restoration when poets began to depict the happy Epicurean and his tranquillity of mind as a model for a certain type of Englishman. This would only have made divines all the more concerned over the infiltration of Epicurean materialism and ethics into the works of atheistical 'wits'. See, Maren-Sofie Roestvig,

nexus of discourses which had already defined human nature, its limits, its duties, and the causes of its inherent dysfunction. Thus, within a prosecution, the systematic arrangement of proof and evidence relied on inherited perceptions of what compelled assent - nature and its lawlike behaviour was considered a permissible witness in terms of its power to expose aberrant behaviour. This evidence, inscribed by the finger of God, functioned as proof, not only of the existence and providence of God, but as an indicator of unnatural tendencies.

A rhetorical approach also assists in dealing with the relationship between science and religion on the terms suggested by John Hedley Brooke, who argues for 'complexity' and points to the failure of master narratives to cover such an extraordinarily intricate web. Brooke continues to plead for an investigation based on the 'use to which scientific and religious ideas have been put in different societies', rather than an analysis based on some 'notional relationship' supposed to exist between monolithic categories.⁵⁹ We can change the notion of 'societies' to one of immediate scholarly context and add the further complexity of individuals drawing on communal reservoirs of scholarship and organising their materials to suit contingent demands - that is, 'use' in the strict sense.⁶⁰ Furthermore, treating the sermons as *particular* cases of anti-atheistic literature may go some way towards solving further problems raised by scholars of atheism. I have selected the examples of Berman and Hunter as representative of this literature.⁶¹

The Happy Man. Studies in the Metamorphoses of a Classical Ideal, (vol. i, Oslo/Oxford, 1958).

⁵⁹ Brooke, *op. cit.*, p. 11.

⁶⁰ See C. F. Richardson, *English Preachers and Preaching 1640 - 1670* (London, 1928) on the procedures whereby divines collected materials into commonplace books and learned the tactics of ordered arrangement into the five major rhetorical divisions of *exordium*, *narratio*, *confirmatio*, *confutatio*, and *conclusio*. There is a certain irony in our current notion of the term 'invention' with its highly individualist connotations, whereas the term *inventio* referred to gathering materials, suited to the occasion, from inherited authorities. The importance of *occasion* requires that we do not conflate diverse situations simply on the presence of similar materials. There is little analytical advantage, for example, in striving to define a common historical category for Cudworth's massive systematic treatise, Newton's unsystematic statements on God, Tenison's anti-Hobbes treatise, and the Boyle Sermons.

⁶¹ David Berman's, *A History of Atheism in Britain: From Hobbes to Russell* (London/New York/Sydney, 1988); Michael Hunter, 'Science and Heterodoxy: An Early Modern Problem Reconsidered', in David C Lindberg and Ronald L. Numbers eds., *God and Nature: Historical Essays on the Encounter Between Christianity and Science* (Berkeley, 1986), 437 - 460. For a general survey of histories of atheism, see David Wooton, 'New Histories of Atheism', in Hunter and Wooton, *op. cit.*, pp. 13 - 54. Berman's Freudian analysis is detailed in his, 'The Repressive Denials of Atheism in Britain in the Seventeenth and Eighteenth Centuries', *Proceedings of the Royal Irish Academy*, 82, (1982), 211 - 45.

In his 1988 book on the *History of Atheism in Britain* David Berman sought to understand why, given the ubiquitous denial of the possibility of a rational path to atheism, divines still pursued their opponents philosophically and conceptually. He claims that the orthodox divided atheists as either 'speculative' or 'unthinking' atheists.⁶² Because these writers claimed the impossibility of speculative atheists Berman sees an act of repression in this denial:

I have argued that the crucial clash which is to be found in the statements of the anonymous Essayist, Balguy, Curteis, Wise, More, Cudworth, and Bently, indicates a tendency to repress atheism.⁶³

With the help of Freud's theory of sexual repression Berman suggests that where we see a conjunction of denial and affirmation there we find repression. Confirmation of this, Berman argues, is found in the often abusive and emotive language of the opponents of atheism. Thus Berman maintains that those who deny the existence of atheists, and then continue to berate them and produce philosophical arguments to confute them, are on a par with those who deny childhood sexuality and then admonish any manifestation of it.⁶⁴

By contrast Michael Hunter's paper is concerned with the 'anxiety of those committed to the new science' and their need to 'distance themselves' from, what he calls, 'religious and philosophical heterodoxy', that is, atheism. Hunter examines the diverse interpretations of historians over the causes of this widespread concern among the ranks of the orthodox. Much of this literature is occupied in searching for the initial conditions which were the harbingers of the 'Enlightenment' - in other words, the key event which allowed unbelievers to circulate their views more freely.⁶⁵

⁶² Berman, *op. cit.*, pp. 44 - 7, gives full titles for the works of these authors

⁶³ Berman, *op. cit.* p. 21.

⁶⁴ Berman actually quotes Cudworth's description for his main purpose in writing the *True Intellectual System* - to protect pious Christians from dangerous, but also seductive, materials. Berman ignores this comment from Cudworth, with all its connotations of contagion and contamination of the pure and vulnerable, because the stated intentions of the divine is less interesting, for Berman, than an historiography based on Freud. Berman, furthermore, adds an ironic twist to the relationship between the prosecutors of irreligion and the prosecuted. His Freudian analysis inverts the locus of disease. By treating the prosecuting divine as the subject of a neurosis, and the fear of atheism as the subliminal content of that neurosis, he diverts attention away from an examination of the tactics of the prosecution. This particular form of reductionism obscures the *de facto* situation that the orthodox response was legally justified and divines were duty bound to effect it.

⁶⁵ The *locus classicus* is still J. S. Spink, *French Free-Thought from Gassendi to Voltaire* (London, 1960). For a discussion which focuses purely on the clandestine transmission of irreligion see, M. C. Jacob, *The Radical Enlightenment: Pantheists, Freemasons and Republicans* (London, 1981).

Some interpretations identify a broad challenge to accepted values in religion and morality, further encouraged by views of the natural world. Other historians focus on 'rival theories about the relation between matter and spirit'.⁶⁶ James and Margaret Jacob, for example, simply write-off atheism as nothing more than an 'exaggerated reaction to radical ideas' on the part of orthodox divines. Hunter, therefore, insists that it is necessary, to re-examine the sources, in order to determine

how the contemporary statements about science and its antagonists are to be understood. What can legitimately be ignored as false or exaggerated in such opinions, and how far can we extrapolate from what was actually said to contemporaries' "real" meaning?⁶⁷

Hunter is also aware of the fact that although the 'scientific onslaught' on atheism was significant the anti-atheist literature was a much wider phenomenon. However, much of his analysis applies to the literature as a whole. Recognising the language of denigration as a *de facto* presence in contemporary texts he asks, was this 'clearly a degree of rhetorical exaggeration', or, were those such as Boyle 'trying to express - albeit in heightened form - something of significance about contemporary society'?⁶⁸ Hunter's answer to this question, that the anxiety over atheism was both 'unfounded' and 'meaningful', is a move towards treating the texts in their own terms. He cites the literature on studies of early-modern witchcraft where attention is paid to the 'intellectual and social function' of ideas which seem absurd to us. Hunter is here relying on theories of 'conspiracy' and antagonism towards individuals who demonstrated antisocial characteristics. Thus atheism is represented as an example of 'deviance' from a social norm, while the orthodox are seen as constructing their attacks around genuine anxieties. Yet, as Hunter points out, the real presence of atheists (deviants) remained shadowy and indistinct:

No one at the time admitted to being an atheist. Even if we were to count all of those people against whom accusations of atheism were made - writers like Thomas Hobbes, Charles Blount, John Toland, and the early Deists, or the libertines like the earl of Rochester - we would still be left with a mere handful, a finding quite at odds with the complaints about the ubiquity of atheism.⁶⁹

Given that atheism was a shadowy presence, Hunter allows that there was

⁶⁶ Hunter, *op. cit.*, p. 438.

⁶⁷ *Ibid.*, p. 439.

⁶⁸ *Ibid.*, p. 443.

⁶⁹ *Ibid.*, p. 444.

exaggeration but that it is not the job of the historian to 'convict' agents of misrepresentation - what we, the historians, are witnessing are 'preoccupations of the day, to which real significance can be attached'. He then lists these preoccupations: a general secularisation, fashionable satire and 'scoffing', and the concern about immorality. The new scientists detected this 'oral' tradition of anti-religion and sought to distance themselves from it - hence the support for theology found in the writings of Boyle and Newton.

I find Hunter's analysis a welcome response to those who would dismiss the problem of atheism as orthodoxy's political manufacturing of fictitious radical elements. However, Hunter does not pay adequate attention to the tactics and language of texts dealing with the crime of atheism. He insists that the 'rhetoric' of the prosecution of atheism was symptomatic of a range of psychological and social disturbances rather than the accepted duty of all ordained ministers. However, there was no need for orthodox divines to draw on 'oral' knowledge of contemporary anxieties. The fundamentals of Christian doctrine systematically provided for all the 'preoccupations' which he sees at work in anti-atheist texts. Hunter seeks to locate these anxieties outside the discursive machinery of the Church: yet it was the Church which defined human nature as riddled with anxieties in the form of sin and the need for regeneration. The 'exaggerations' on the part of orthodoxy, which Hunter calls anxieties, were necessary because atheism was defined as an exaggerated condition of normal human weakness. Sermon after sermon proclaimed the sinfulness of the English nation and the need for a general reformation of character. This reaction is unsurprising in a nation which witnessed - in the space of little more than half a century - two civil wars, the beheading of a king and an archbishop, the proscription of its national church and the flight of a divinely-appointed monarch.

The preceding historians of atheism are concerned to go behind the texts to search for underlying reasons for attacks on real or imagined atheists. Yet the texts of the orthodox were clearly drawn from a reservoir of discourses which legally permitted the depiction of atheism as a heinous crime. There was no etiquette which denied the tactics of wit, ridicule, parody and calumny to the defenders of a system which had legal and institutional prerogatives to control the circulation of certain views. Moreover, meeting atheists head-on in a philosophical *disputatio* was widely recognised as dangerous as it depicted the orthodox and the infidel occupying a level

playing field.⁷⁰ The Boyle Lectureship possessed a legal brief to prosecute the unacceptable behaviour of the irreligious, using any means available. Harris was adamant that there could not be a respectable and neutral point of contact. Like Cudworth, and so many others, Harris considered his task to be a prosecution of the atheist, and the denigrating of his principles as inherently flawed due to their origin in corrupt practices. He used an unproblematic blend of Cartesianism, Scepticism, the standard rational *a priori* proofs for the existence of God, proofs from the consideration of the natural world; and proofs drawn from the site of human sinfulness. In terms of its juridical function this programme was highly effective. Thus, by focusing on the rhetorical notion of *victory*, the manner in which the prosecution was constructed is as important as the matter used in formulating arguments. The suasive force of texts such as Harris's did rely on the anxieties alluded to by Hunter. Also there was a concerted effort on the part of divines to suppress atheism. However, I disagree over the use of the term 'anxiety' and the appropriateness of a Freudian analysis as both carry resonances of conspiracy and witch-hunting. These terms, by portraying divines acting under covert impulses, reduce the overt aim of a prosecution - to control and restrain those who infringe a legal boundary.

The eclectic nature and paradoxical presence of Harris's materials, therefore, can be resolved if we take an overview of his programme and his aim.⁷¹ The question of the relationship between the various discourses from which Harris's materials have

⁷⁰ Charles Kors makes this point regarding the public spectacle of French academics - Cartesians and Aristotelians - in philosophical dispute over the relative merits of arguments for the existence of God. Kors argues that it was the public nature of the disputes which lead to the collapse of a viable philosophical support for the existence of God. See, Alan Charles Kors, ' "A First Being of Whom We Have No Proof". The Preamble of Atheism in Early-Modern France', in Alan Kors and Paul J. Korshin, eds., *Anticipations of the Enlightenment in England, France, and Germany* (Philadelphia, 1987), pp. 17 - 68. For a detailed discussion of this topic see, L. W. B Brockliss, 'Aristotle, Descartes, and the New Science: Natural Philosophy at the University of Paris, 1600-1740', *Annals of Science* 38 (1981) 33-77.

⁷¹ There is a need for much more research on the complexity of attitudes exhibited by orthodox divines towards dangerous materials. The interest, for the historian, lies in the paradoxical responses to learning: it was the subject of parody, satire and vilification by divines, while at the same time there was the scholarly need to absorb the new learning within literary performances. For a detailed discussion of the use of parody in ambiguous and complex criticisms of the new philosophy - especially the proprietorial desire to conquer and appropriate novel material, see, Robert Phiddian, *Swift's Parody* (Cambridge, 1995).

been drawn can then be directed to the immediate needs of the performance itself.⁷² In the following sections I will examine Harris's attack on atheism by analysing both the form and the content of the Sermons. First, I will focus on his attack on the 'character' - in rhetoric the *ethos* - of the person. Secondly, I will examine selected themes from the sermons to demonstrate his attack on the 'philosophical principles' of atheism.

5. 3. THE SERMONS

5. 3. 1. The 'Person' of the Atheist

Harris provides a good example of the importance of rhetorical ordering of materials in the case of a prosecution. In conformity with Boyle's brief he delivered the requisite eight sermons throughout 1698.⁷³ The subject of his opening Sermon, was the *person* of the atheist, while the second and subsequent Sermons dealt with the *arguments* brought forward to philosophically support infidelity. Harris drew on a wide range of materials and covered many of the standard attacks on Christianity: Epicurean materialism, determinism and free will, fate versus providence, religion as 'Priestcraft', etc. His overall performance may be divided into two parts - the prefatory attack on the character of the atheist and the substantive attack on his doctrines. It is crucially important that we understand this distinction which defined the form and content of Harris's performance. When discussing the character of the atheist Harris drew on a variety of contemporary materials: theological doctrine, conceptions of the human mind, and contemporary theories of human understanding, but he particularly portrayed the atheist as beyond rational appeal.⁷⁴ Although this was a commonplace, as we saw when dealing with Boyle's list of enemies, Harris, unlike Bentley, utilised it as a means of side-stepping a direct philosophical challenge from speculative atheism. His self-proclaimed task was

⁷² Champion, in *Pillars of Priestcraft* (Cambridge, 1992), pp. 224 ff., has an interesting discussion on the link between Burnet's construction of the 'matters of fact' of history and Boyle's notion of an experimental matter of fact. Champion is concerned to point out how disciplines such as history were resources which 'intellectuals could employ to enshrine their particular ideals', p. 226.

⁷³ Harris's sermons were published almost immediately and therefore they exist in separate form. These do not vary substantially from the collection contained in Letsome and Nicholl - all quotations from the Sermons are from this edition.

⁷⁴ See above, Chapter Two, for a series of contemporary dictionary definitions of atheism which invariably represented the atheist in this manner. The lexicons were merely repeating materials which their authors found in the texts of representative theologians.

*to shew the Groundlessness and Inconclusiveness of those Objections, which atheistical Men usually bring against the great and important Truths of Religion.*⁷⁵

However, the ‘Groundlessness and Inconclusiveness’ of the atheist’s objections were not to be simply undermined through rational argument but were to be exposed by treating them as philosophical ‘garb’, which Harris argued was a mere disguise - rags covering the naked body of infidelity. As all defenders of Christianity maintained, atheism could not by its very nature be philosophical and any attempt to clothe infidelity by means of philosophical coverings was a mere exercise in the art of concealment. It was Harris’s first task to expose, to *discover*, the body underneath.

The first sermon carried the title ‘Immorality and Pride the great Causes of Atheism’.⁷⁶ This opening sermon was principally concerned with the method by which an individual declines into atheism.

And first, I think it very necessary to say something of *the Causes* of Infidelity and Atheism, and to shew how it comes to pass that Men can possibly arrive to so great a Height of Impiety. This my Text naturally leads me to, before I can come to the great Subject I design to discourse upon; and I hope it may be of very good Use to discover *the Grounds* of this heinous Sin, and the *Methods* and *Steps* by which Men advance to it; that so, those who are not yet hardened in it, nor quite given up to a reprobate Mind, may, by the Blessing of God, take heed, and avoid being engaged in such Courses as do naturally lead into it.⁷⁷

His first task, Harris explained, was to deliver ‘the general Character or Qualifications of the Person the Psalmist speaks of’. He identified the ‘wicked man’ of the tenth Psalm with the contemporary atheist. The atheist boasted of his wickedness, defied God, denied providence and despised the prospect of God’s vengeance. This posturing led to pride and in the speculative atheist was further enhanced by the deceit of ‘vain philosophy’.⁷⁸ Harris constructed a history, a method

⁷⁵ Letsome and Nicholl, *op. cit.*, i, the ‘dedication’ to Harris’s sermons. In the dedication to the published version of the first sermon, Harris thanked the Trustees, for their ‘candid Patronage and Acceptance’, assuring them that he ‘studied to be as plain and intelligible’ as he possibly could. He also remarked on how this ‘Method’ of treating the subject would have satisfied Boyle

⁷⁶ His chosen text was Psalm 10: 4: “The Wicked, through the Pride of his Countenance, will not seek after God; Neither is God in all his Thoughts”.

⁷⁷ Letsome and Nicholl, *op. cit.*, i, p. 356.

⁷⁸ The motif of attacking ‘vain philosophy’, which echoed Paul’s words to the Athenians, by those who had significant interests in natural philosophy requires further examination. For example, Roger L’Estrange complained, how ‘[w]e are fallen into an age of vain Philosophy; (as the Holy Apostle calls it) and so desperately over-run with Drolls and Sceptics, that there is hardly anything so Certain, or so Sacred: that it is not exposed to Question’.

or development, by which the atheist moves from an initial state of wilful wickedness, through pride, to the search for philosophical crutches. The causes of atheism are immorality and pride and therefore the original motivation for atheism is located in the will and not the faculty of reason. The subsequent construction of systematic argumentation was a mere *post facto* attempt to bolster atheism with philosophy. Harris is quite clear on this distinction. A philosophical attack on atheism was necessary not because it defeated atheism *per se* but because it allowed orthodoxy to appropriate or denigrate the conceptual weapons used in the public defence of anti-Christian opinions. Harris's major strategy was to undermine the use of philosophical evidence by the atheist by attacking the character and therefore the ability of the witness to judge rationally. Philosophical credibility therefore was a prerogative of the orthodox. This is further evinced by the ubiquitous claim on behalf of the orthodox that it was only the true Christian who could effect a restoration of true philosophy.

It would be useless for the historian to present Harris's bare philosophical arguments, without emphasising his strategy. The 'history' of infidelity discloses the atheist as *first* corrupt, then made foolish and stupefied by vice, then made a philosopher out of desperation and the desire to persuade others. This notion of 'contagion' is of further interest since the atheist was presented as spreading his doctrine in the manner of a disease. If containment of the person by incarceration was not possible, then the principles could be made safe by removing the appealing garments of rhetoric.⁷⁹ Undressing served to expose the decaying body on which atheistical systems were constructed: Harris called this the 'grand design', of the Sermons. His representation of the steps toward atheism, *via*, vice, corruption and eventual foolishness, inverted the claim that rational investigation was the foundation of a critique of religion.

⁷⁹ Those who have examined the seventeenth century's critique of rhetorical language have also recognised that it did not prevent the critics from availing of the power of persuasion by means of rhetorical practice. For example, Sprat's *History of the Royal Society* (1667) and Locke's *Essay on Human Understanding* (1690), were typical in their use of metaphor to attack metaphor. See Anthony Grafton *Defenders of the Text* (1991), p. 2; Brian Vickers' *Rhetoric and the Pursuit of Truth* contains a detailed discussion of this point; *idem.*, *In Defence of Rhetoric* (Oxford, 1988), pp. 198 ff. For an analysis of Locke's metaphorical attack on metaphor, see Geoffrey Bennington, 'The Perfect Cheat: Locke and Empiricism's Rhetoric', in, Andrew E. Benjamin Geoffrey N. Cantor and John R. R. Christie, eds., *The Figural and the Literal: Problems of Language in the History of Science and Philosophy 1630 - 1800* (Manchester, 1987), pp. 147 - 75.

Harris's attack was not simply *ad hominem* but drew on sound scholarly resources. For instance, the concept 'fool' (not even Bentley took time to explain the consequences of the Psalmist's assertion that it is *only* the fool who can say in his heart that there is no God) finds its place within the theological doctrine of the Fall. Harris demonstrated a strict philological connection between the concepts of 'fool' and 'wickedness': his exegesis showed how the Hebrew word *Nabal* often signified both. The 'fool' in Scripture is literally the 'wicked' man. It further signifies one that has deliberately (by an act of will) chosen foolishness.⁸⁰ Harris cited Paul, who described the character of such a fool as one possessed of an 'evil heart of unbelief', the wicked being debauched in their practices they become so in their principles. It is human nature, made corrupt through sin and the Fall, which is responsible for the decline into total depravity (foolishness) of the atheist. Harris in his peroration to the first Sermon drew heavily on the doctrine of original sin, the inherent inclination towards depravity which all human beings possess as the result of an original wilful rejection of our pure nature. For this reason all infidelity is the product of a natural inertia motivating the individual to act out of self-interest. By utilising the doctrine of Original Sin, Harris castigated the principles of atheism as the result of this natural inertia of the will.

Let them consider impartially the Arguments for Infidelity, and they will find *them all forced and strained Paradoxes, invented by sceptical and canting Philosophers. a crafty and designing Sort of Men, who set up Atheism because they get by it, and whose Interest it is that there should be no God and Religion.*⁸¹

The melancholy brought on by this attendant self interest drives the atheist 'to catch at' crutches. Some simply drown themselves in an excess of debauchery. Others, Harris claimed, having acquired some 'smattering in the superficial Parts of Learning', will defend their behaviour by a pretence to 'Reason and Argument.' This deployment of philosophy leads the already corrupt individual further into the sin of

⁸⁰ Letsome and Nicholl, *op. cit.*, i, p. 357.

⁸¹ *Ibid.*, p. 364. Harris's reliance on the doctrinal formulation relating to an inherent depravity was strictly in line with the 39 Articles, particularly the unambiguous language of Article xvii 'Of Predestination and Election'. Thus although Anglican theology rejected the Calvinist notion of predestination to damnation, it retained, as a fundamental necessity, the awareness of the tendency to sin in every act of the will, unless assisted by grace and a regenerative process within the soul. This is true even for those divines customarily labelled moderates or rationalisers. See, W. M. Spellman, *John Locke and the Problem of Depravity* (Oxford, 1988).

'Pride'.

Harris describes this fault as the fundamental ground of '*Speculative Atheism*' citing Vanini as his exemplar. Vanini's hubris was the result of his pretending to be,

[an] Adept in a Philosophy that is as much above the rest of Mankind's Notions, as it is contradictory to it; to assume to himself a Power of seeing much farther into things than other folk, and to penetrate into the deepest Recesses of Nature. He would pass for one of Nature's Cabinet counsellors, a Bosom Favourite, that knows all the secret Springs of Action, and the first remote Causes of all Things.⁸²

This pretence of Vanini, Harris explains to his audience, was the cause of his being

burnt for Atheism at Tholouse, A. D. 1619. Whose Mind, he [Vanini] says, grew more and more strong, healthful and robust, as he exercised it in searching out the Secrets of that supreme Philosophy, which is wholly unknown to the common and ordinary Rank of Philosophers: And this, he saith, will soon be discovered by the Perusal of his Physico-Magicum, which was now to see the Light.⁸³

Harris portrayed Vanini as the archetypal fool who through his apparent wisdom was so foolish that he suffered death rather than relinquish his pride.⁸⁴ Thus Vanini's recourse to 'philosophy' was, in itself, not sinful. Philosophy only became 'vain' through the complete reliance on reason, and the pride which resulted from self-sufficiency. Reason denied providence and enhanced the self-sufficiency of human nature in its capacity to understand and to enjoy the world. This was contrary to almost the whole of Christian teaching with its emphasis on the Fall and on Redemption. For this reason a denial of providence - and the support of natural religion - was tantamount to atheism.⁸⁵ However, in presenting a complete

⁸² *Ibid.*, p. 361.

⁸³ *Ibid.*, p. 362-3. Harris was referring to Vanini's, *Amphiteatrum aeternae providentiae divino-magicum, Christiano-physicum, nec non astrologo-catholicum. Adversus veteres philosophos, atheos, epicureos, peripateticos, et stoicos* (1615). We can see from the title that Vanini claimed to refute a list of philosophical 'enemies' of religion similar to those pursued by Harris and the rest of the Boyle Lecturers.

⁸⁴ Harris - in a phrase from Plato but also found in Lactantius's *De ira Dei*, - described the behaviour of the atheist as 'mischievous ignorance'. It was important for Harris's argument that the conflict between the atheist and the theist was an ancient one. Throughout the Sermons he drew heavily on Sextus Empiricus as the originator for many of the tactics of contemporary atheism. He points out how '[w]ith the like Assurance so the modern Writers of this Kind express themselves - only from the arguments of the ancients, a little varied and embellished. Thus, 'Machiavel [sic] Spinosa, Hobbes, Blount, and all the late atheistic writers' had, according to Harris, nothing new to say.

⁸⁵ There is no theological evidence for classifying the Sermons as 'natural religion'. The case of Harris - who was not averse to rational discourse within theological polemics - illustrates the limitations imposed on reason, since he acknowledged the necessity for things *above* our rational comprehension.

prosecution, Harris in subsequent sermons also analysed the 'weakness' of the arguments against the existence of God.

The search, by the atheist, for supporting philosophical principles was undertaken from, what Harris termed, 'interest'.⁸⁶ He turned an ancient Epicurean accusation - that religion was the result of priestly duplicity, or party interest - against the atheist. The atheist, Harris said, claimed that *apatheia*, the tranquil freedom which followed the abandonment of priestcraft, was the result of this freedom of mind. Harris argued that empirically it was well known that atheists engaged in 'self-murder', which indicated that there was no respite from the unnatural acceptance of principles so contrary to human nature.⁸⁷ The purported use of reason by the atheist was, Harris claimed, nothing more than a mere device, or subterfuge, by which he gained this interest - the very position which the Epicurean charged divines as holding. It was a cultural motif that the proper exercise of reason required impartiality. Thus any suggestion of interest immediately ruled out objectivity. The atheist had abandoned the possession of the faculties required for impartial judgement through the practice of a corrupt life. This confined the atheist in the same category as the madman or the fool whose displays of rational behaviour were only to some selfish end.⁸⁸ This inversion of the charge of interest allowed Harris to argue that, except in the hands of the orthodox, reason was a cunning ruse, a device for duplicity. Therefore the faculty of reason belonged by a natural right only to the orthodox. Caught in this battle for the appropriation of a supreme faculty of the human understanding was philosophy - including natural philosophy. In the hands of the atheist it was a weapon of unreason, duplicity, and party-interest, a last-ditch

⁸⁶ The *OED* provides contemporary examples, from the works of Norris, Pope and Swift, of the negative connotations associated with contemporary party or temporal interest.

⁸⁷ Many of the lecturers referred to the habit of suicide among atheists - no doubt the suicides of Blount and Thomas Creech were fresh in the memories of contemporaries. Turner, for example, accused the atheist of supporting '*Incestuous Marriages, and Self-Murther* [sic]', see Letsome and Nicholl, *op. cit.*, ii, p. 354. See Michael Macdonald, *Sleepless Souls: Suicide in Early Modern England* (Oxford, 1990).

⁸⁸ Hillel Schwartz, *Knives, Fools, Madmen, and that Subtle Effluvia: a Study of the Opposition to the French prophets in England 1706 - 1710* (Gainesville, 1978). Offspring Blackall, who was Boyle Lecturer for the year 1700, argued that both the French Prophets and the atheists were subject to the same 'Satanic agency'. See, Michael Heyd, 'Medical Discourse in religious Controversy: The Case of the Critique of "Enthusiasm" on the Eve of the Enlightenment', *Science in Context*, 8 (1995), 133 - 57. Although Heyd is particularly concerned with Enthusiasm he does comment on the possibility of extending his analysis to other 'outside' groups such as 'atheists' and 'Catholics'.

resort to undermine faith. In the hands of the righteous, as Samuel Clarke explicitly stated in his own sermons, it demonstrated the concordance of *true* philosophy and divinity.⁸⁹ Furthermore, the notion of a restoration of true philosophy goes some way towards explaining why certain Anglican divines, who were not practising natural philosophers, supported atomism, formerly symptomatic of chaos and disorder, but now presented as the paradigm Christian philosophy.⁹⁰ The corpuscular (or mechanical) philosophy was referred to as the 'true' philosophy restored to orthodoxy by providential design.⁹¹

It is perhaps difficult for the historian to recapture the diametrical opposition between the ontology of atomism and the Christian conception of a Creator who was also providentially involved in the maintenance of his creation. Even the motive energies or powers necessary to explain the motion of the atom were treated with some trepidation by the orthodox: witness the case of Newton's anxiety over the question of an innate power in matter. The polarisation of order, a first and final cause, against chaos - the mere fortuitous and senseless clashing of atoms - was continued by imposing a necessarily divine ordering on chaotic particles. There is a noticeable similarity between the terms in which Bentley caricatured the atom and the language which Harris applied to the person of the atheist: both the atom and the atheist were stupid, brutish, inactive, dull and senseless. However, Harris claimed that atomism and the mechanical philosophy had, as their '*Concomitant*' and '*necessary Result*', the 'Doctrine of immaterial Substances'. The ancient supporters - those before Leucippus and Democritus - had, understood

⁸⁹ See below, Chapter Six, for his extended use of this traditional trope. Allied to the trope was a sister trope of 'clarification' and 'accessibility' - the dark and obscure doctrines of the irreligious made clear and intelligible to the imagination.

⁹⁰ It is this kind of language which permits oppositional tropes of order/disorder to take on a sociological tenor and has led commentators to draw political analogies between certain natural philosophies and their implications for social order. I am suggesting that the language may be taken at face value as it signifies the detection and prosecution of a literal disorder, especially since it was treated as such by the agents themselves.

⁹¹ The fact that Newton rejected 'orthodox' mechanical conceptions - that interactions between bodies and the transference of force must be by mutual contact - matters little for the *general* perception that the mechanical philosophy was an ancient truth restored and made the ally of true divinity. On Newton's adherence to this common late seventeenth-century trope see, B. J. T. Dobbs, 'Newton's Alchemy and his "Active Principle"', in P. B. Scheurer and G. Debrock (eds.) *Newton's Scientific and Philosophical Legacy* (Dordrecht/Boston/London, 1987), 55 - 80; Richard S. Westfall, 'Isaac Newton's *Theologiae Gentilis Origines Philosophiae*', in W. Warren Wager, ed., *The Secular Mind: Transformations of Faith in Modern Europe* (New York/London, 1982).

that they had a clear and distinct Idea of two Things, *viz. passive Matter*, and *active Power*; and these they found were perfectly distinct from each other, and no way dependent at all on each other. To the *former* of these, they only attributed Extension and Impenetrability, and a Power of being variously figured, modified, disposed and moved. To the *latter*, they ascribed Cogitation, Life, Sensation, and the Power of Motion, which they plainly saw did belong to *this*, and could not do so to the *other*. And these two, they made the two great Principles or general Heads of Being in the Universe, and called them by two vastly different Names . . . one *passive Matter* or *Bulk*, and the other *Self-activity* or *Life*.⁹²

Epicureanism attributed to the atom all the characteristics normally reserved for God. Thus the case of the appropriation of Epicurean physics demonstrates that not only was it necessary to denigrate the atom - the Epicurean primary cause - it also required the denigration of the Epicurean.⁹³

5. 3. 2. The 'Principles' of the Atheist.

The second Sermon carried the title 'The Atheists Objection, &c. Refuted'.

Harris explained how

under this Head, I shall make it my business to enumerate all the pretended Arguments and Objections which I have met with, and are of any Weight, against the Being of a God in general; and then endeavour to shew how weak and inconclusive they are, and how miserable a Support they will prove for Atheism and Infidelity.⁹⁴

However, the attractions of a philosophical or naturalistic explanation were not to be met head on. In strictly rhetorical fashion Harris constructed, or at least gave literary substance, to the atheist: a 'fool' through vice and corruption, whose defunct faculties clutch at the philosophical straws of the ancient atheists. He accused Hobbes, Spinoza and Blount of gleaning all their materials from the writings of Sextus Empiricus. Within the context of the ancients-moderns debate not only were atheists fools, they were doubly so for not realising the progress made by the moderns. However, as so many Christians were at risk from the apparent rationality of systematic atheism, all arguments which denied providence, supported a necessary

⁹² Letsome and Nicholl, *op. cit.*, i, p. 394. Cudworth, in his *True Intellectual System*, argued that the atomic philosophy predated Leucippus and was not always materialistically inclined. Harris continued this argument, attributing the primary-secondary qualities distinction to the ancients, which he claimed constituted the foundation of the principle *ex nihilo nihil fit!*

⁹³ However, Gassendi defended Epicurus's reputation in the service of a humanist anti-Aristotelianism. Evelyn and Charlton also attempted to restore the image of Epicurus. See Lynn Sumida Joy, *Gassendi the Atomist; Advocate of History in an Age of Science* (Cambridge, 1987).

⁹⁴ Letsome and Nicholl, *op. cit.*, i, p. 356.

fate, nature, or soul of the world, etc., had to be stripped of their credibility. Thus the second Sermon set out, - 'in their natural Order' - the chief heads under which the atheist constructed his '*Objections*' to the existence of a Deity.

Harris divided his attack into three distinct topics. First, the objections against the existence of God 'in general', which was subdivided into two further objections - that we can not have an idea of God and that the notion of God has its origin in fear and ignorance played upon by crafty and cunning priests. Under the second head he refuted objections against God's attributes and perfections. Thirdly, he countered objections against the 'Truth and Authority of Revealed Religion'. The second Sermon covered the first part of the first set of objections and the third Sermon dealt with the second part. Sermons four and five covered the demonstration that God could not be material and must therefore be immaterial: Harris's chosen text was the words of John 4: 24, 'God is Spirit'. The three final sermons covered God's attributes. In particular, Harris was concerned to refute the doctrines that all things operate according to an absolute determination and that God was likewise a necessary agent. These last two opinions are described by Harris as, 'two of the strongest Holds of Atheism and Infidelity, which it is therefore absolutely necessary to batter down and demolish'.⁹⁵

It is not essential to discuss in detail Harris's philosophical treatment of these arguments. He repeatedly accused the modern atheists of having stolen all their arguments from the works of the ancients. For example the view that the world runs according to its own inherent power, 'a Kind of necessary and blind Cause of Things, Nature, the Soul of the World, or some such Word' was only a view which they 'happened to meet with in the ancient Heathen Writers'.⁹⁶ In contrast to the atheists' (purported) reliance on the ancients he deployed the philosophies of the moderns - Locke and Descartes. He used the language of Lockean ideas to counteract the

⁹⁵ *Ibid.*, p. 414. Other Boyle Lecturers also focused on the problems of fate and necessity, since these notions undermined the possibility of absolute good and evil without which it was difficult to defend the ideas of justice, rewards and punishments. John Clarke, for example, published his Boyle Sermons (1719) under the title, *An Enquiry into the Cause and Origin of EVIL*, and his 1720 Sermons were published as, *An ENQUIRY into the Cause and Origin of MORAL EVIL*. These followed the pattern of his brother's Sermons, where their first series relied on the 'principles of philosophy', and their second series relied on moral philosophy. John Clarke specifically answered the Manichaean doctrine of Pierre Bayle, which argued for two distinct and supreme origins for good and evil.

⁹⁶ *Ibid.*, pp. 357 - 8.

Hobbesian notion of the impossibility of having any idea of God. Hobbes maintained that an incapacity to form an adequate idea in the imagination was an indicator that such an idea had no signification, it was a mere empty sound. Harris responded to this charge by distinguishing between *inconceivable* ideas and *incomprehensible* ideas.⁹⁷ Thus, he argued, there was a vast difference between having no idea at all and having an imperfect one.⁹⁸ Harris argued that even though '[the] immense Nature of God is incomprehensible to our finite Understandings' at the same time 'we do not say it is absolutely inconceivable, and that we can know nothing at all about it'.⁹⁹

Harris continued his application of modern philosophical principles by utilising a further variant on Lockean scepticism. Locke set out in his *Essay* to define the limits of our understanding. Harris appropriated this discovery of the moderns as a defensive tactic against what he characterised as the *dogmatic* demands of Hobbes and Spinoza.¹⁰⁰ These authors had failed to take account of the limits imposed on human nature and either were unable to recognise or deliberately ignored that there was 'something incomprehensible in the Nature of all Things'. Are there not, Harris asked,

a thousand Beings, which we are sure are truly and actually existent in Nature, the Manner of whose Operation and Action we cannot comprehend, and whose *Phaenomena* we cannot philosophically explain? Let any of these penetrating Gentlemen try their Skill at *Gravity, Light, Sound, Magnetism* and *Electricity*, and oblige the World with such an adequate Account of *any one* of them, as shall make all impartial and curious Men acquiesce in it as satisfactory. Let him clearly shew us how his own *Sensations* are made; how the *Circulation of the Blood first begins, and continues its vital Tour* round his Body: how *pestilential and contagious Diseases first invade* and are *propagated*; how several Medicines, that may be properly enough called *Specifics*, operate: and particularly, how the *Cortex Peruvianus* cures an

⁹⁷ This argument depended on two separate strands. First, the common theological distinction between things accessible to reason and things above reason, and secondly, an appropriation of the modern understanding of an 'idea in the mind' found in Descartes' and Locke's theories of human perception..

⁹⁸ Thus our ideas were forever, due to our fallen condition, 'indistinct' or 'shadowy'. This had Scriptural sanction (1 Cor. 13: 12) in the Pauline notion of seeing 'through a glass darkly'.

⁹⁹ Letsome and Nicholl, *op. cit.*, i, p. 371.

¹⁰⁰ Letsome and Nicholl, *op. cit.*, i, p. 368. See the preface to Locke's *Essay on Human Understanding* (1689). The epigraphs to Locke's *Essay* are highly revealing of his general scepticism regarding the incapacity of reason to search into the nature of things. There are still many useful insights, relating to the connection between scepticism, fideism and natural philosophy, to be had from Louis I. Bredvold's *The Intellectual Milieu of John Dryden* (Ann Arbor, 1934). For a more recent discussion of the issues see, Kroll, *The Material World (passim)*.

intermitting Fever: In a Word, let him tell us how his *own Body* (setting aside Accidents) *decays, grows old, and dies*, when the same *Digestions* and *Assimilations* are made to Day, as were Yesterday, and there is no apparent Defect in the Nutriment of any one Part of it.¹⁰¹

We apprehend these things even if we do not comprehend them fully:

We cannot indeed perfectly comprehend the Nature of God, because we have shallow, limited, finite and imperfect Capacities and Faculties, and the Deity contains in himself all possible Perfection.¹⁰²

Harris attacked the 'empiricism' of the atheist by ridiculing total reliance on the senses for knowledge. Belief in invisible things was a component of all philosophical and religious systems throughout all recorded time. He cited the ancient Protagoras, who criticised those who were 'uninitiated' into the mysteries of knowledge concerning invisible things. Harris also cited, ironically, Democritus who argued for two kinds of knowledge, that derived from the senses and another knowledge 'genuine and proper' which comes *via* the mind. This belief in invisible things is not peculiar to the religious, otherwise

[t]he *Epicurean* Atheist must needs grant the Existence of his *Atoms*, and his empty *Space*; when yet they must be both acknowledged to be no way sensible Those that hold a Soul or Life of Matter, plastically diffused through all Parts of the Universe, by which all Things are actuated and regulated, cannot deny but this Power is invisible, and no way the Object of bodily Sense.¹⁰³

He continued to attack the denial that anything can exist which is not the object of sense by utilising a variant on the Cartesian *cogito* argument. We clearly and distinctly conceive the existence of a 'self' yet we cannot comprehend its nature just as with many things outside the self.

Now let him call this Mind or Soul of his what he pleases, I do not here consider its Nature; let it be a Substance distinct from Matter; be it a happy Combination of animal Spirits, or the brisk Agitation of any fine and subtile parts of Matter, it is all one to our present Purpose, it certainly *exists, or is*; and yet is it by no Means an Object of Sense.¹⁰⁴

Thus under the second head - *incomprehensibility*, Harris deployed scepticism to define the narrow limits of the understanding. At the same time he attacked the standard tropes of philosophical Scepticism, found in the writings of Sextus

101 Letsome and Nicholl. *op. cit.*, i, p. 371.

102 *Ibid.*, p. 374.

103 *Ibid.*, pp. 369 - 70.

104 *Ibid.*, p. 370.

Empiricus and re-deployed by Hobbes, which denied the possibility of beliefs regarding materials beyond the range of our comprehension. This subtle use of a general scepticism, indicative of a culturally widespread reaction to dogmatic systematising, allowed Harris to argue for the ‘conceivability’ of certain ideas beyond the limits set by modern theories of the understanding.¹⁰⁵

From Descartes, Harris borrowed the proof for the veracity of sensory information. Descartes’ refutation of the sceptical argument that our senses are unreliable because they are often deceived, was dependent on a prior proof of God’s existence. Harris repeated Descartes’ tactic, that we trust our senses on the grounds that God does not deceive us. Thus it was essential to establish the existence and attributes of God in order to be assured that He had appointed our senses to be adequate for the things they perceive. Like Descartes, he also utilised a combination of the traditional argument from a first cause and the argument that from the awareness of our own imperfections we understand, or intuit, a source of perfection. Since we are led to assert the existence of something on which everything depends, there must be something from all eternity, therefore there must be a first cause. The first cause must be an ‘active, intelligent, wise, and powerful Being’ and all the perfections which are in creatures are derived from the ‘Perfect which holds all perfections in the highest degree’. Harris pointed to our common perception of imperfection. Therefore we must have some idea of perfection. A conception of our own limitations demands the existence of an ontologically prior existent, possessed of the qualities of the unlimited, against which we measure our own epistemic constraints.

And as the Beings themselves are derived from, and produced by this eternal and self-existent Being, so must all their Perfections and Qualifications too: For they are indeed the most noble Things in their Natures. Knowledge, therefore, and Wisdom, Thought and Reasoning, and all the excellent Powers and Faculties that are found in any Creatures, must come from the same Power, that produced those Beings and Natures in which they are inherent.¹⁰⁶

However, Harris’s main proof for God’s existence was simply a repetition of Descartes’ view that there was an innate idea of God assuring us of his existence. In fact the force of Harris’s other arguments (and Descartes’) depended on the presence

¹⁰⁵ See. Bredvold, *op. cit.*, csp. Chapter Three.

¹⁰⁶ Letsome & Nicholl, *op. cit.*, i, p. 373..

of an innate idea of the existence of God, an idea which Bentley, in his own Sermons, completely rejected as a proof of God's being.¹⁰⁷ Moreover, Harris, while accepting Locke's language of ideas, also placed himself in opposition to Locke by using Descartes' innate notion of God as a proof of its universal presence in the minds of all human beings.

The common Notion which all Mankind have of a God, is a sufficient Refutation of this Part of the Objection, as it is also a very good Proof of the real Existence of a Deity; for if there were no such Being, it is impossible to conceive how any Idea of him could ever have come into any one's Mind; as I shall hereafter more largely prove.¹⁰⁸

Harris was clearly familiar with the content of Bentley's Sermons since in his first Sermon he repeated Bentley's arguments for the advantages of religion and for its conformity to the rules of morality, reason and truth. The section on the 'offer of rewards' is almost identical to Bentley's own views. Yet his view on the question of innate ideas is diametrically opposed to Bentley's.¹⁰⁹ Harris's defence of the doctrine of innate ideas illustrates the freedom which divines had to pick and choose materials from their personal stock. There were no doctrinal reasons for arguing either in favour of or in opposition to the presence of innate ideas. However, it is noteworthy that in the space of less than a decade two Boyle Lecturers held such contradictory views on a significant topic. The apparent contradictory use of materials is resolved when we view the Sermons not as a concerted philosophical dispute over the being and attributes of God, but as occasions on which the appropriation of arguments, which might serve atheistical ends, was a matter for the strategic decision of the Lecturer.

One further illustration of Harris's tactics, which helps to unify those so far examined, is his conception of God. This may be usefully described as 'voluntarist' but only when considered in the light of the deistic view that nature must be ultimately knowable by human reason. This brings together a range of issues bearing on the theological use of contemporary philosophy and science, as it related directly

¹⁰⁷ As we saw in Chapter Four, above. Bentley maintained Locke's argument against innate ideas as he considered it to be a prop for the irreligious.

¹⁰⁸ Letsome & Nicholl, *op. cit.*, i, p. 368.

¹⁰⁹ This contrast in the application of such a well known topic illustrates the independence which Lecturers had in choosing their materials. Moreover, it also shows the limited policing of the performances by the Trustees.

to what could possibly be known of nature's processes. In Harris's discussion of the extent to which the human mind could penetrate God's reason and power, he relied, once again, on a form of Lockean scepticism. Harris portrayed the deistic clarion call for unfettered reason as a species of epistemological arrogance, accusing the deists of attempting to pry into areas where the human mind lacked natural capacity. His attack depended on a prevailing trope - 'impenetrability'. Nature was covered from our direct gaze by the disadvantage inherent in human perception and understanding. The deist denied this by enhancing the powers of reason to discover the mysteries of nature - ultimately to demonstrate that there could be no such thing as a mystery. The penetration of the gaze of the deist placed a concomitant restraint on the powers of the Deity. Harris directed this charge at Blount's *Anima Mundi* where it is said that an atheist is not only one who denies God's existence but denies 'God's Providence, or . . . restrain[s] it in some Particulars, and exclude[s] it in Reference to others'. The notion of restraint on God's absolute power seems to have accompanied the increase in the claim for an expansion of the power of human reason. Vanini classed Cicero as an atheist on these grounds and remarked that to deny providence was the 'same Thing as to deny a God'. Voluntarism and the setting of limits to human reason, therefore, may have acted as an attack on the pretensions of the deists to open nature and dispel all mystery. Many historians have drawn connections between voluntarist conceptions of the deity and support for an anti-dogmatic and empirical natural philosophy. I suggest that it also acted as an anti-deistic device and furthermore that both voluntarism and a limited reason found justification in the doctrinal concepts of sin and the Fall.¹¹⁰ Thus unless his arguments against the being of God were 'direct Demonstrations' the atheist, Harris charged, is the most stupid of men when he ought to be as certain of this matter as with any 'Theorem of Euclid'. However as pure demonstration and absolute proof are only possible in geometry and mathematics then the absolute demonstration of the non-existence of any thing is impossible. If there remained the possibility of the truth of religious doctrines and we exhibit, as human beings, an incapacity to penetrate into

¹¹⁰ In his *The Material World*, Kroll argues for the importance of a non-dogmatic epistemology driven by a probabilistic physics of the material world. See Raymond D. Tumbleson, 'The Science of Anglicanism', *J. Hist. Ideas*, 57 (1996), 131 - 56. Tumbleson argues that the probabilistic method of 'Anglican Science' was deployed in the polemical antagonism to Catholic dogmatic methods in the period immediately prior to the Glorious Revolution.

the essential nature of all things, then, Harris concluded, no one should abandon religion.

I have presented only a small selection of material from Harris's attacks on the philosophical principles of atheism and in a much less formal manner than that contained in Harris's well structured sermons. The main drive behind his overall programme was to locate both the sin and the crime of atheism in a corrupt and diseased human nature and then to define the limits of human understanding, while at the same time asserting the absolute power and sovereignty of God over his creation and his subjects. Thus the appropriation of the atheist's philosophical arguments was made possible by the tactics of scepticism which subverted their claim on the supremacy of human reason. The depiction of the atheist as occupying the same cognitive space as the fool or the madman (and very often the enthusiast) conformed to a traditional trope whose force was located in the desire for order and the repulsion from disorder, sin, chaos and disease. Without the communal acceptance of this trope much of the power of Harris's narrative would have been defused. The ironic and oxymoronic use of the atheist as 'wise-fool' and the parodic caricature of the puffed-up pride of vain learning would be lost. I have also shown how prosecution of the atheist required the complex and paradoxical appropriation of dangerous materials: this alone makes the search for a definition of the Sermons pointless. The final section examines the Newtonianism of Harris.

5. 4. Harris no Newtonian?

John Harris's name appears in almost every historian's list of those who used Newton's natural philosophy in the defence of Anglicanism and has often been cited as a representative Newtonian apologist. This characterisation of Harris persists in the literature in spite of the surprising fact that his Boyle Sermons made no appeal to Newtonian principles. There is neither a single mention of Newton nor the *Principia* in the published versions. The substance of Harris's Sermons has been ignored in favour of an unjustifiable label derived from readings of his *Lexicon Technicum*. Defining Harris's career by the Newtonian materials in *Lexicon Technicum* may be the result of comparing heterogeneous and incommensurable materials in order to impose consistency on Harris's thought. This approach is taken by Geoffrey Bowles

in the only substantial article, devoted to an examination of the thought of John Harris, by a recent historian of science.¹¹¹ He is concerned specifically with concepts of matter and the problems faced by contemporary natural philosophers in defining its properties. Bowles argues that historians should resist grouping discussions on the nature of matter into 'Platonist, Scholastic, Cartesian and Newtonian Categories'. He claims there were, however, two explanatory models: one based on the 'shape and motion' of constituent particles and the other on 'powers or efficacious laws'. This is clearly the consequence of a separation between Gassendi, Descartes, and Boyle on the one hand and Newton on the other. Bowles argues that contemporary natural philosophical speculation on the nature of power and figure was in danger of becoming lost through indistinctness. He cites Cheyne's usage of the terms as typical of the lack of consistency over the application of either model.¹¹² He considers that Cheyne's support for the standard definition of matter ('lifeless', 'inert' etc.) held in conjunction with the view that a power of gravitation was also necessary, but non-material and non-mechanical, was symptomatic of the general confusion. Since Harris managed to negotiate the confusion successfully, Bowles therefore uses Harris's *Lexicon Technicum* as a 'case study' which 'manifests a clear conception of the two models'.¹¹³ The importance of Bowles's paper for our examination of the sermons and the question of Harris's Newtonianism lies in his attempt to determine an evolutionary thread, in Harris's thinking, running between 1698 and 1710.

There is an important difference, Bowles explains, between the accounts of matter published in 1704 and in 1710: the former has shape of constituent particles the latter short range forces.

The sources of Harris's models are easy to document, as he makes no pretence to originality in this respect and freely acknowledges his debts. For the theory of matter in volume I he leans heavily on the works of Boyle, supported by Hooke and Halley; in volume II his source in the great majority of instances is Newton's *Opticks*.¹¹⁴

¹¹¹ Geoffrey Bowles. 'John Harris and the Powers of Matter', *Ambix*, 22 (1975), 21 - 38. Bowles describes Harris as a 'Whig, a minor mathematician, and a hack writer, whose abiding interest was to instruct the upper classes in the new philosophy'.

¹¹² George Cheyne, *Philosophical Principles of Religion Natural and Revealed &c.*, (London, 1715), p. 182.

¹¹³ *Op. cit.*, p. 21 (mispaginated as p. '12').

¹¹⁴ *Ibid.*, p. 23. Harris used the Latin *Optice* of 1706, for his materials in volume two of *Lexicon Technicum* (1710). In the first volume Harris had apologised in the Preface for not having

The *Opticks* therefore operates, in Bowles analysis, as the crucial factor in determining the changes. Harris does refer his reader, in the Introduction to the 1710 volume, that there is a 'further account of that most amazing Property the Attraction of the Particles of Matter one towards another, first discover'd by that Incomparable Mathematician and Philosopher Sir Isaac Newton'. The new 'Queries', which were added to the Latin *Optice* (1706) are also mentioned by Harris, and it is these, Bowles argues, which 'provided Harris with much of the new material he introduced in 1710'. Harris was also, according to Bowles, at

[s]ome pains . . . to show that Newton had subscribed to the doctrine of forces in 1687 and had been restrained only by his natural caution and modesty.¹¹⁵

However, the apparent adulation of Newton notwithstanding, Bowles' main claim is that Harris's enthusiasm was more for the doctrine of forces itself than for Newton's system *per se*. To illustrate this he tracks references to the term 'power' and the way it was used by Harris in his writings between the Boyle Sermons and volume II of the *Lexicon*. An examination of the strategies used by Bowles is helpful in determining whether the label 'Newtonian' is justified when applied to Harris. Bowles maintains that Harris was at pains even in his Boyle Sermons to highlight the concept of power as the essential property separating matter and spirit. Accordingly, Harris

followed the broad lines laid down by Richard Bentley, who had delivered the first Boyle Lectures in 1692, and attempted to answer the atheist's objections to the existence and the spiritual nature of God.¹¹⁶

In the sermons, Bowles continues, Harris demonstrated the existence of spirit from the phenomenon of motion, a '*Divine activity or God-like Energy*'. However, Bowles claims that by 1706 - 10 Harris's Boyle Lectures had receded into the background, and the *raison d'être* of such refutations of atheism was waning:

The atheists, to whom Harris had referred, in 1697, as "those *Invisible Gentlemen*", had disappeared completely under a ponderous mass of

Newton's *Opticks*, that is the English work of 1704, sooner. Thus Harris draws heavily on the extended Queries, 17 - 23 (25 - 31 in the English edition of 1717), to the Latin edition. Some entries in volume I do cite the *Opticks*, but the *Principia* and Newton's papers in *Philosophical Transactions* are used much more. For these reasons it would be difficult to determine quantitatively Harris's use of Newton in the two volumes. Bowles's comment, that Newton is much more prevalent in the 1710 volume, is misleading. His portrayal of the later volume as a progression from Harris's thinking in the first volume is also misleading, since Bowles acknowledges that the later volume was a 'supplement' to the first.. Harris is quite clear that the 1710 volume is the second volume of a two volume work.

¹¹⁵ *Ibid.*, p. 23.

¹¹⁶ *Ibid.*, pp. 31 - 2.

reasoning, science and morality; the orthodoxy, which by 1706 clearly included the Newtonian cosmology, had triumphed. The few writings of the Deists, confined to hit-and-run attacks on religious ceremony, or, at worst, on the Divine Providence, gave little enough cause for alarm.¹¹⁷

What remained for Harris was his independent thinking on the concept of power and its relationship to the tenuity of matter which forced Harris to seek for alternative accounts of how matter interacts. Although Harris once thought of matter as passive, he overcame that view and attributed powers to matter based on the acceptance of Newton's short-range forces. Bowles's reasoning is grounded on the incidence of the term in the Sermons and in the *Lexicon*. Unfortunately for Bowles there is no entry under the heading 'power' in either volume of the *Lexicon* which directly treats the concept of a power of matter. Furthermore the connotations of the term in the Sermons was also prevalent in the Cambridge Platonists' use of active energies and in the Scholastic notion of *natura naturata*. Bowles himself claims that Harris was simply using the polysemous nature of the term which had, as cognates, the terms 'virtue', 'quality', and 'attraction'. For some reason he mentions this in passing but seems not to act on it. The ubiquity and polysemous nature of the terms may be illustrated by John Keill's act of appropriating the Peripatetics' range of similar terminology. Keill was happy to draw from all the various schools anything 'what may be thought useful', and took from the Aristotelians

the Terms Quality, Faculty, Attraction, and the like; not that by these words we pretend to define the true and physical Cause and Modes of Action, but as those Actions may be augmented and diminished, and therefore since they have Properties of Qualities, the same Name may not unfitly be applied to them, so that we thereby only mean to express the Ratios of the Forces or their Augmentation and Diminution.¹¹⁸

Since Harris used these terms interchangeably throughout his writings, it is surprising that Bowles describes his blending of the terms as the result of 'an ill-defined . . . enthusiasm born of ignorance of the conceptual difficulties involved in Newton's accounts of forces'. It is not true that Harris was so ill informed since in volume I, when he required precision over the different powers associated with matter he used the term '*vis*', and distinguished, according to Newton's classification in the

¹¹⁷ *Ibid.*, p. 33.

¹¹⁸ John Keill, *An Introduction to Natural Philosophy: or, Philosophical Lectures Read in the University of Oxford, A. D. 1700. To which are added the DEMONSTRATIONS of Monsieur Huygens' Theorems concerning the Centrifugal Force and Circular Motion* (London, 1720), p. 3

Principia, between *vis centripeta*, *vis centrifuga* and *vis impressa*.¹¹⁹ In volume II he drew on the Latin *Optice* and concentrated on the *vis inertiae materiae*, and provided experimental and philosophical discussions of the resistance of fluid media to bodies moving in them as the result of *vis inertiae*. Harris's purpose in the latter case was to instance one of the standard refutations of the Cartesian 'subtle matter' as an account of motion and gravitational attraction. Interestingly, in the light of Harris's use of Descartes in the Sermons, by the time he published volume II of the *Lexicon* he had become viciously anti-Cartesian, ridiculing the vortex theory and the arguments for a plenum. Also his use of Locke had increased to the point of full-scale support for the *Essay* and a complete abandonment of the doctrine of innate ideas, in spite of the usefulness of this doctrine in the Sermons. Harris's account of the powers of matter differs little from that of Keill. Once again Bowles actually cites Harris's indebtedness to the Keills, particularly regarding the concept of 'attraction'.¹²⁰ In the light of such turns and twists on the part of Harris there may be other ways of understanding the incidence of particular terms in Harris's writings throughout the period 1698 - 1710.

I have suggested that simply tracking terms in the hope of determining cognitive change and independent thinking may not be analytically useful in the case of Harris. Part of Bowles's concern over the *prima facie* inconsistency found in the use of terminology by natural philosophers stems from his own failure to detect the *use* to which the terms were put. This is particularly true in a dictionary where the author is almost completely relying on the work of others.¹²¹ Harris made his indebtedness quite clear, as Bowles points out, in the 'Preface' to volume I of the

¹¹⁹ He further divided *vis centripeta* into three kinds, '*Absoluta*', '*Acceleratrix*', and '*Motrix*': the first was mass, the second velocity downwards and the third 'Gravity', or the tendency to a centre, that is, 'weight'. See *Lexicon*, i, '*Vis*'.

¹²⁰ Bowles refers specifically to John Keill's paper read before the Royal Society and published in *Philosophical Transactions*, 26 (1708). Harris also used James Keill, *An Account of Animal Secretion, the Quantity of Blood in the Humane Body, and muscular Motion &c.* (London, 1708). Bowles comments that John Keill's paper was 'prevented from becoming anything more than an exploratory speculation' by the 'lack of quantifiable experimental evidence'.

¹²¹ For a recent discussion on the contemporary practice of writing encyclopaedias and dictionaries see Richard Yeo, 'Ephraim Chambers' *Cyclopaedia* (1728) and the Tradition of Commonplaces', *J. Hist. Ideas*, 57 (1995), 157 - 75. Compare, Ann Blair, 'Humanist Methods of Natural Philosophy: The Commonplace Book', *J. Hist. Ideas*, 53 (1992), 541 - 51.

Lexicon, where he specifically states his sources for the various ‘sciences’.¹²² Furthermore, Bowles assumes that Harris’s discussions of the notion of power can be tracked simply by noting substantive changes in the definitions of the term. However, the term has a very different function in Harris’s other works.¹²³ The oratorical situation of the Sermons which demanded victory in the pulpit ought not to be conflated with the production of a lexicon, the two projects were subject to very different constraints and objectives. The Trustees of the Lectureship provided Harris with a highly specific brief, whereas the London booksellers, who considered natural philosophy to be a lucrative literary project, commissioned the *Lexicon Technicum*. What is common to both the Sermons and the *Lexicon* is Harris’s dependence on a vast range of contemporary sources from which he borrowed useful material, almost always acknowledged. On occasions whole passages were taken from another writer to serve the purpose at hand.¹²⁴ Bowles’s attempts to provide Harris with definite views fails, because the scholarly sites from which Harris was operating changed throughout this period.

In 1698 Harris was involved in disputes over natural history, the Creation and the Deluge. His scholarly circle was vastly different than the one he sought access to in the next decade. Harris considered himself to be a ‘mathematician’ and the first volume of the *Lexicon* makes clear that the main purpose of the dictionary was to

¹²² For example, the ‘Phaenomena and Properties of the Air and Atmosphere, as its Gravity, Spring or Elasticity etc., . . . chiefly from the Honourable Mr. Boyle and the Philosophical transactions; ‘Springs and Fountains . . . from Capt. Halley and Dr. Woodward’; the ‘Ingenious’ Halley also provides the theory of the tides ‘built on Mr. Newton’s Principles’; ‘Botany’ from ‘Ray, Morison, and Monsieur Tournefort; fossils from Woodward; the laws of motion from ‘Wallis, Newton and Varignon’; metals and stones from ‘Wilkins’ Real Character; and ‘Heat’ from Newton and Halley’. Interestingly, Harris refers to Flamsteed’s refusal to supply ‘any Communication’ regarding his star catalogue. See, the ‘Preface’ to volume one (unpaginated).

¹²³ In the sermons it refers to the ‘self-moving Power’ of spiritual substances, either the soul of man or God, which is the distinguishing characteristic of spirit. In his argument against Hobbes’s idea that incorporeal substance is a contradiction in terms, Harris argued that the property of life, cogitation and self motion must inhere in some substance. See, Letsome and Nicholl, *op. cit.* i, pp. 390 ff. Most of the content of the fourth sermon is concerned with this topic. In *Lexicon Technicum* (1704) the term ‘power’ was only used in reference to the traditional six ‘mechanical faculties’ of the ‘balance’, ‘lever’, ‘wheel’, ‘pulley’, ‘wedge’, and ‘screw’. The only change in 1710 is the reduction of these to five - the wheel is dropped from the list.

¹²⁴ Whole passages from the *Philosophical Transactions* are often transcribed verbatim. His entry on ‘Fluxions’ is composed of several pages from Charles Hayes’ book on the same topic. The *DNB* entry on Hayes claims that this work, *A Treatise of Fluxions; or, an Introduction to Mathematical Philosophy etc.* (London, 1704), was the first English work to have explained Newton’s method of infinitesimals. Hayes was Deputy-Governor of the Royal African Company and an excellent Hebraist and scholar of antiquities.

present the 'Modern Improvements of Mathematical and Physical Learning'. This would counter the 'cant' of the schools which only provided 'words' and not 'things' and for this reason he had been

very full and particular in the Mathematicks, because 'tis the only Solid Foundation on which a Useful Enquiry into Nature and all Physical Learning, can possibly be built; and because 'tis also of the greatest Use and Advantage to Mankind in all respects.¹²⁵

By the time he came to write volume I of the *Lexicon* he had already published several works on mathematics and related subjects, such as, *The elements of Plain Trigonometry demonstrated, and its practice and use explained* (1703) and *The description and uses of the Celestial and Terrestrial Globes and of Collins' Pocket Quadrant* (1703). Also, in 1701, he had translated Pardies' *Elements of Geometry* into English; in 1702 he published, *A new short Treatise of Algebra; with the geometrical construction of equations . . . Together with a specimen of the nature of . . . fluxions*, and in 1705 a table of 'bills of exchange' for tradesmen.¹²⁶ Thus Harris had moved out of the natural history circle and was now making his way in the scholarly network of mathematical and astronomical practitioners. By 1710 he was acting as Secretary to the Royal Society during Newton's presidency.¹²⁷ Thus Harris's changing attitude towards useful materials can be interpreted as the result of his desire to obtain patronage and a career as a mathematical writer. Moreover, the second volume of *Lexicon Technicum* contained an increased number of articles on mathematics, to supplement more discursive accounts of natural philosophy given in the earlier volume. That this occurred at a time when he was about to work under 'the incomparable Sir Isaac' should come as no surprise, given Harris's lifelong pursuit of suitable patrons.

The characterisation of Harris as 'Newtonian disciple' would be acceptable if we account for discipleship in terms of the hopes and needs of Harris in order to satisfy his career prospects. However, the term - in any sense - was not applicable to Harris during his election to the Boyle Sermons, and neither can any of the material in the sermons be labelled Newtonian. Furthermore the success of Newton's 'mathematical philosophy' would enhance the sale of Harris's own mathematical

¹²⁵ *Lexicon Technicum*, (1704), 'Preface' (unpaginated).

¹²⁶ A full list of Harris's publications can be found in both the *DNB* and the *DSB* articles.

¹²⁷ Harris served one year (1709 - 10) as Secretary.

productions. However, Harris's open support for Newton was not guaranteed to provide security within the Royal Society. Harris had made many enemies in the Society, including Hans Sloane who had little affection for Newton. If Harris sought the patronage of Newton against the ill wishes of Sloane he was unsuccessful. Bowles makes this point but rejects it as a causal factor in explaining Harris's behaviour, on the grounds that an 'institutional' approach fails to take seriously Harris's independence of thought.¹²⁸ Bowles, however, fails to take account of Harris's constant search for institutional security and for the fact that both the Boyle Sermons and the *Lexicon* were constructed by borrowing materials wholesale from a wide range of sources depending on Harris's contingent requirements. Harris was hardly the independent thinker that Bowles portrays.

Yeo has drawn attention to the similarity between the constructions of encyclopaedias and commonplace books and this fits well with the practice of gathering materials for sermons. He quotes Chambers' definition of

Common-Places, *Adversaria*, among the Learned, are a Register, or orderly Collection of what things occur worthy to be noted, and retain'd in the Course of a Man's reading, or Study; so despos'd, as that among a Multiplicity of Heads, and things of all Kinds, any one may be found, and turn'd at pleasur.¹²⁹

This would also go some way towards explaining the alacrity with which certain terms and systems are appropriated by divines when constructing particularly agonistic treatments of undesirable targets. For example, the widespread support for the mechanical philosophy's definition of 'body' or 'matter' as a useful contrast with the terms 'God' and 'Spirit'. Regardless of how many powers were postulated as the hidden causes necessary to produce the phenomena, or visible effects, matter remained a

sluggish, insensible, passive, and unintelligent Thing, not possibly able to move of itself, or to act or perform any Thing by its own Power; but all the Motion and Activity that it hath, comes to it by Communication from something that is without it, or distinct from it.¹³⁰

Rhetorically, the emphasis on matter and motion, was the most advantageous (for

¹²⁸ Bowles' is attempting to undermine the historiographical model which traces ideas in a downward flux from the greater to the lesser mind - thereby subsuming the thought of lesser minds. Harris, I suggest, is not a good model for Bowles' purposes as his projects were invariably developed from his position within a particular scholarly community.

¹²⁹ Ephraim Chambers, *Cyclopaedia* (London, 1728), quoted in Yeo, *op cit.*, p. 165.

¹³⁰ Letsome and Nicholl, *op. cit.*, i, p. 387.

English divines) mistake made by Descartes. Descartes, it was claimed, provided atheists with a vocabulary of 'motion and matter' as the universal causes which could then be used to explain all known effects. Likewise, the apparent 'scepticism' adopted by the 'mathematical philosophers' was located in their insistence that they only dealt with effects which were quantifiable - the essence of bodies was not their concern. Even Newton in his 'de natura acidorum', speaks of the 'forces' and 'powers' of bodies in terms of the 'shaking', 'vibrating' and 'shoving' of constituent particles, and not of the power *per se*. Bowles is quite wrong to insist that Harris attempted to offer an account of power in itself.

By the time he wrote the first volume of *Lexicon Technicum* Harris was operating with an inherited mix of diverse materials which demanded, as its primary criteria, a mathematically grounded 'Physics', a Lockean scepticism with regard to penetrating to the heart of matter, and an anti-Cartesianism as a shibboleth with which to denounce atheism. The growing authoritative status of these criteria can be seen by their presence in a wide range of contemporary texts: while the specific context can be determined by examining their precise usage and application. Given that the use of a particular strategy is dependent upon its precise situation, it is clear why in the Sermons he had to denigrate matter and elevate spirit or divine power, especially when dealing with the claim that spirit was only matter differently configured. In texts which supported mathematical philosophy, force, power, and attraction were prioritised, not as to their essential nature, but simply because they could now be quantified. The atheist 'imagined' that his materialism could, as Harris said, claim that 'Philosophy is called in to his Assistance'. However, the only semi-respectable philosophy available to the atheist was Cartesianism and this contradicted the 'Nature of Things', as Harris demonstrated over and over in his articles in the *Lexicon Technicum*. Cartesianism was also criticised as being insufficiently mathematical. Furthermore, in the Sermons, his discussion of matter does not approach Bentley's sophistication in the use of contemporary natural philosophy. There is not a single reference to the work of Newton on gravitation, even when he discusses the mystery of gravity and the supreme power of God as a necessary agent in activating it. On the other hand in the *Lexicon* there are very few theological references to the power of the deity - power is always given a mechanico-mathematical explanation.

Commentaries continue to portray Harris's Sermons as conforming to a Newtonian defence of Anglicanism. Larry Stewart, for example, insists, how '[p]roperly understood Newton's principles were formidable weapons', and legions of defenders such as 'John Ray, Nehemiah Grew, John Woodward, John Harris, John Keill, and William Whiston, among others were tripping over each other in their rush to prove Scripture reinforced by natural philosophy'.¹³¹ Stewart's list of Newtonian commentators is perhaps too rashly constructed and is symptomatic of the literature in general. Much of the mischaracterisation of the Sermons has resulted from similar acts of conflation where the need to detect 'popularisations' of Newton's views is the governing hermeneutic principle.

It is, therefore, necessary to emphasise that there is no connection between the style and content of the Boyle Sermons and those works deliberately designed as 'introductions' to a natural philosophy based on geometry or mathematics. The works of John Keill, Desaguliers, William Whiston, Henry Pemberton, 'sGravesande, Maclaurin, and many others had the specific intention of refuting, in whatever way possible, the Cartesian system and promoting Newton's application of mathematics and geometry to 'Physicks'. This was not the intention of Boyle's brief. Even in Clarke's highly metaphysical demonstration of the existence of God, which was self-proclaimedly mathematical, the term 'mathematical' bore little relationship to the programme of those who deliberately engaged in mathematising natural philosophy.

The example of 'sGravesande, as he echoes the view of Harris and the others, demonstrates the vastly different nature of the project of a mathematical 'Physicks', and the Boyle Sermons.

Natural Philosophy is placed among those parts of mathematics, whose Object is Quantity in general. Mathematics are divided into pure and mixed. Pure Mathematics enquire into the general properties of Figures and abstracted Ideas. Mixed Mathematics examine Things themselves, and will have our Notions and Deductions to agree both with Reason and Experience.¹³²

¹³¹ Stewart, *op. cit.*, *passim*, but esp. pp. 72 ff. The presence of John Keill in a list with Ray and Woodward is odd. Keill in fact belongs in the list of those, such as 'sGravesande, Desaguliers, and Harris himself, who insisted on grounding all natural philosophy in mathematics.

¹³² W. J. s'Gravesande, *Mathematical Elements of Natural Philosophy, Confirm'd by Experiments: Or, an Introduction to Sir Isaac Newton's Philosophy*. Translated, from Latin, by J. T. Desaguliers (2 vols., 6th. ed., London, 1747). Preface to the First Edition, p. ii. By attending to 'Nature herself', s'Gravesande says, we will avoid 'Fictions of whimsical Men' (Cartesians) and 'even be able to determine the Limits of the Understanding'. Physics 'belongs to' mathematics, and deals with, as

Furthermore 'Physics' (s'Gravesande uses the plural) ought not to meddle with the first 'Foundation of Things':

That the World was created by GOD, is a Position wherein Reason so perfectly agrees with Scripture, that the least Examination of Nature will shew plain Footsteps of supreme Wisdom. It is confounding and oversetting all our clearest Notions, to assert that the World may have taken its Rise from some general Laws of Motion, and that *it imports not* what is imagined concerning the first Division of Matter. *And that there can hardly be any thing supposed, from which the same Effect may not be deduced by the same Laws of Nature.*¹³³

He repeats the standard sceptical tropes: terms such as 'substance' signify 'one of the things hidden from us', also God's power might have placed in body properties which are hidden from us. We must not be ashamed to admit our ignorance, he continues, neither should we imagine that body can be known *a priori*. The effects of matter may depend on external causes which our ideas cannot comprehend. The sphere of human understanding is bounded 'within a narrow compass', but the little that 'Physics' asserts is 'certain':

From a few general Principles numberless particular Phaenomena or Effects are explain'd and deduced by mathematical Demonstrations. For the comparing of Motion. or, in other Words, Quantities, is the continual Theme; and whoever will go about that Work any other way, than by mathematical Demonstrations, will be sure to fall into Uncertainties at least, if not into Errors.¹³⁴

The appeal to certainty based on matters of fact and authority does play a role in the argumentative strategies of the Boyle Lecturers. However, the Lectures did not attempt to persuade by means of experiments, nor did they use mathematically grounded principles. Yet lack of attention to the precise location of language has allowed some historians to conflate all performative philosophy of this period into a common Newtonian programme.

The Sermons cannot be forced into this category. They were not spectacles of Newtonian experimentation applied to doctrinal concerns. If Harris is to be labelled 'Newtonian' it is in the sense in which 'sGravesande or Desaguliers comply -

its foundations, the 'Properties of Bodies' and the 'Laws of Nature'. Since philosophers do not agree on what these properties are, sGravesande explains how he 'thought fit to make good the *Newtonian method*'.

¹³³ *Ibid.*, p. ii. Even Desaguliers' *Preface* to his *A Course of Experimental Philosophy*, a work specifically arguing for the need to perform experiments, requires careful reading as it supports the case that mathematics was being propagated as the foundation for 'true' philosophy even though the work is ostensibly devoted to experiments.

¹³⁴ *Ibid.*, p. v.

the desire to make 'Physicks' the property of those with an interest in promoting mathematically grounded natural philosophy. I have shown that Harris's various undertakings need to be separated and that his 'Newtonianism' is not applicable to his Sermons. By the time he came to produce *Lexicon Technicum* he was seeking access to a very different scholarly network: whether those involved in the production of texts demanding that Physics be mathematically and geometrically grounded ought to be labelled 'Newtonian disciples' is a question outside the scope of this thesis. It is in this sense that Harris can legitimately be described as a Newtonian and *not* because of his Boyle Sermons.

Chapter Six

Samuel Clarke: Certainty and Method in the Interests of True Religion and Virtue.

6. 1. Introduction.

Since Jacob and others characterise Clarke as a Newtonian, it is important to state at the outset that this chapter is concerned only with his Boyle Sermons and not with his other writings. Clarke's overall relationship with Newton is, of course, a crucial topic. However, as the central issue of this study is to analyse critically the claim that the Boyle Lectureship was a Newtonian venture, we will determine whether Clarke's Sermons support this interpretation. It will be argued that a close reading of Clarke's published Boyle Sermons does not support this claim by Jacob and others.¹ Instead, in this chapter I will argue that Clarke's main strategy lay in the application of a particular 'method' - which was not Newtonian, but was derived far more from Clarke's interaction with Descartes, and from Clarke's opponents, principally Hobbes and Spinoza. Thus Clarke's Boyle Lectures cannot be simply described as 'Newtonian'. In this section I will locate Clarke's Sermons within a context which highlights his own philosophical programme.² I argue that it is

¹ The central core of this claim is contained in Jacob's assertion, that 'churchmen turned to the Newtonian system as the model inherent in nature and applied its principles to the society in which they lived'. See, *NER*, p. 191. John Gascoigne sanctions this view of the social and institutional motivations of the theology of the Boyle Lectures, see *Cambridge in the Age of Enlightenment* (Cambridge, 1989), pp. 81 - 2. According to Steven Shapin, Clarke's 'Boyle lectures followed Richard Bentley's in erecting Newtonianism into one of the moral bulwarks of Christianity . . .', see 'Of Gods and Kings: Natural Philosophy and Politics in the Leibniz-Clarke Disputes', *Isis*, 72 (1981), 187 - 213, p. 190. Supporters of the argument for a Newtonian social order are many and varied. Two notable examples are, N. C Gillespie, 'Natural History, Natural Theology, and Social Order: John Ray and the 'Newtonian Ideology'', *Journal of the History of Biology*, 20 (1987), 1 - 50, and Richard Olson, 'On the Nature of God's Existence, Wisdom and Power: The Interplay Between Organic and Mechanistic Imagery in Anglican Natural Theology 1640 - 1740', in, Frederick Burwick ed., *Approaches to Organic Form* (Dordrecht, 1987), pp. 1 - 48.

² Even when the content of Clarke's metaphysics is treated in its own terms the urge to associate his Sermons with Newtonianism overrides all considerations. Thus, in one of the best general treatments of Clarke's philosophy, the author - whilst arguing that the metaphysics and theology of the General Scholium owed much to Clarke - still describes him as Newton's 'disciple'. See, James P. Ferguson, *The Philosophy of Dr. Samuel Clarke and its Critics* (New

essential to explore both the content and the method employed in his Sermons in order to determine their precise use. Section two offers suggestions for the choice of Clarke as Boyle Lecturer. Section three is a close analysis of Clarke's method, and selected themes from the content of the Sermons. The final section analyses the precise use Clarke made of Newton's writings in supporting his attacks on materialism.

Samuel Clarke was born in Norwich on 11 October 1675. He attended the Free Grammar School until 1690 when he went up to Cambridge where he was admitted pensioner at Gonville and Caius College. According to Ferguson, this was an obvious choice for East Anglians since its founders had come from Norwich, and the majority of its scholarships were allocated to students from that area.³ Furthermore, many of the Fellowships were awarded to students from East Anglia.

As Ferguson comments

such a student, if he had academic ambitions, would find himself in a privileged position when it came to the question of obtaining a fellowship. Hence it is probable that Clarke was sent to Gonville and Caius without any other College having been considered.⁴

Clarke's tutor was John Ellis.⁵ Because university professors were few and rarely lectured, the influence of the tutor upon the student was of paramount importance.⁶ It was through Ellis that Clarke was introduced to the Cartesian philosophy. Roger North in his *Autobiography* commented how in the 1660s there was in the 'brisk part of the university' a 'general inclination' to support the philosophy of Descartes.⁷ By the end of the century very little had changed - the publication of Newton's *Principia*

York/Washington/Hollywood, 1974), p. 252.

³ J. P. Ferguson, *An Eighteenth Century Heretic: Dr. Samuel Clarke* (Warwick, 1976), p. 3.

⁴ *Ibid.*, p. 3.

⁵ Both Newton and Ellis were knighted in 1705 when Anne visited Cambridge. Interestingly, Westfall cites a recollection of Humphrey Newton who claimed that Newton had 'few Visitors, excepting 2 or 3 persons, Mr Ellis of Keys [sic]', *Keynes MS 135*, quoted in *Never at Rest*, p. 191. Obviously Ellis's Cartesianism was not a barrier between him and Newton.

⁶ See, Mordechai Feingold, ed., *Before Newton: The Life and Times of Isaac Barrow* (Cambridge, 1990), pp. 9 - 15, for a detailed account of the relationship between the Trinity College tutor James Duport and his student Isaac Barrow.

⁷ North *Autobiography*, University Library Cambridge, MS. Baker 37, fol. 163 - 163v, cited in M. A. Hoskin, "'Mining all Within": Clarke's Notes to Rohault's *Traité de Physique*', *The Thomist*, 24 (1961), 353 - 63, p. 353. Newton provides, in his 'Trinity Notebook', one of the best and most detailed instances of a student's involvement with the Cartesian philosophy. See, J. E. McGuire and Martin Tamney, *Certain Philosophical Questions: Newton's Trinity Notebook* (Cambridge, 1983), esp., Chapter Two, 'The Cartesian Influence', pp. 127 - 94.

notwithstanding. John Ellis, according to Benjamin Hoadley, was a ‘zealot’ for Cartesianism, and it was Ellis who urged Clarke to translate, into better Latin, one of the best of the Cartesian textbooks - Rohault’s *Traité de Physique*.⁸ Whiston recalls how in 1697 - the year in which the translation appeared - Clarke approached him to ask his advice on the ‘fitness’ of such a venture. This was due to Clarke’s perception that the *Principia* offered alternative explanations for the phenomena in Rohault’s text. Whiston’s reply was as follows:

Since the Youth of the University must have, at present, some System of Natural Philosophy for their Studies and Exercises; and since the true system of Sir Isaac Newton was not yet made easy enough for the purpose, it is not improper, for their Sakes, yet to translate and use the system of Rohault [who was esteemed the best Expositor of Des Cartes] but that as soon as Sir Isaac Newton’s Philosophy came to be better known, that only ought to be taught, and the other dropp’d.⁹

It is this enterprise, to translate Rohault’s text into better Latin, which is marked by historians as the beginning of Clarke’s discipleship under Newton. However, the translation proved a much more complex affair. M. A. Hoskin has provided a detailed study of the various editions of Clarke’s Rohault and of the accompanying notes in which Clarke argued against some of the claims of Rohault’s physics by means of the ‘best writers’ of ancient and contemporary natural philosophy. Clarke, as Hoskin says,

refers to a bewildering variety of earlier authors: to classical writers like Aristotle, Pliny, Seneca, Livy, Plutarch and Macrobius, to Cartesians such as Régis, Malebranche, Perrault and le Clerc, and to accounts of experiments

⁸ See Hoadley’s ‘Life’ prefaced to, Samuel Clarke, *The Works of Samuel Clarke, D. D. Late Rector of St. James’s Westminster* (4 vols., London, 1738) i. p. i. The use of the term ‘zealot’ is significant and is Hoadley’s not Clarke’s term. Hoadley, in his ‘Life of Clarke’ constantly referred to Descartes’ philosophy as ‘Romantic fiction’, ‘fantasy’ and ‘fable’. Ironically, Whiston referred to Hoadley’s and Sykes’ biographies of Clarke as too ornate and panegyric to be of use, see, William Whiston, *Historical Memoirs of the Life and Writings of Dr. Samuel Clarke, Including certain Memoirs of several of his Friends* (3rd. ed., London, 1748). p. 2. Rohault’s text was used as a foundational work on natural philosophy in the university: according to Whiston it was still in use in the late 1720s. In 1696 - the year preceding Clarke’s translation - there was a reissue of the Latin edition of Rohault’s *Physique Jacobi Rohaulti tractatus Physicus, gallice emmissus et recens Latinitate donatus, per Th. Bonetum* [Théophile Bonet] *D. M. Cum animadversionibus Antonii Le Grand Cui accessit ejusdem Rohaulti: De arte Mechanica, tractatus mathematicus e gallico sermones Latine factus* (London, 1696). The *De arte Mechanica* was a translation of Rohault’s *Les mechaniques*, published in his *Oeuvres posthumes* (1682). This may have increased the urgency for a better translation.

⁹ Whiston, *op. cit.*, p. 3. See, Hoskin, *op. cit.*, p. 355. Among the Cartesian treatises available in England were, Antoine Le Grand, *An Entire Body of Philosophy*, trans., Richard Blome (London, 1694), and Robert Midgley, *A New Treatise of Natural Philosophy* (London, 1687).

by the *Accademia del Cimento*, Hooke and Boyle, as well as to the writings of Newton himself.¹⁰

In the first edition, Clarke's use of Newton was confined to his prismatic experiments and the theory of colours. Hoskin comments on how little the reader would find on Newton's 'great cosmological synthesis'. He also draws attention to the fact that Newtonian attraction 'is not even mentioned': Rohault's Cartesian views are not systematically refuted in favour of Newtonian philosophy. However, historians who have concentrated on later editions have wrongly assumed that Clarke was a fully-fledged Newtonian in 1697.¹¹ It is not until the edition of 1702 that we see a change in Clarke's attitudes. In that edition the notes were increased to one fifth the size of the original text and there was a direct assault on foundational Cartesian doctrines, especially the identification of space with matter, and the denial of a vacuum. Gravity was also discussed as 'an original connate and immutable affection of all matter' independent of the air or aether.¹² However, large and important sections of Rohault's text remained uncriticised, and it was not until the edition of 1710, four years after the publication of Clarke's translation of Newton's *Optice*, that Clarke made his assault on the remaining Cartesian arguments. The timing, therefore, of Clarke's various literary ventures is crucial. It will be argued in subsequent sections of this chapter that although Clarke abandoned (piecemeal) Cartesian doctrines he did so slowly and for a variety of reasons. Furthermore, he did not abandon the merits of the Cartesian method, which he utilised in his Boyle Sermons. In attempting to force the *method* of Clarke's Boyle Sermons into a Newtonian mould certain commentators have generated rather odd links between Newtonian mechanics and Clarke's metaphysics.¹³

To illustrate the strained interpretations put upon Clarke's Sermons I will

¹⁰ Hoskin, *op. cit.*, p. 356.

¹¹ *Ibid.*, p. 358. In the first edition the notes are tucked away at the back of the book, and are referred to on the title page and in the Preface by the diminutive *annotatiunculae*. See, Clarke, *Jacobi Rohaulti Physica; latine vertit, recensuit et eberioribus iam Annotationibus, ex illustrissimi Isaaci Newtoni Philosophia maximam partem haustis, amplificavit et ornavit S. Clarke, S. T. P.* (London, 1697).

¹² Hoskins, *op. cit.*, p. 359.

¹³ Clarke's use of the term 'mathematical' to refer to his method in the Sermons has permitted the easy association between this term and Newton's mathematisation of natural philosophy, as if the two enterprises were part of an overall programme.

compare the work of two commentators, differing widely in their respective interpretative positions but at pains to identify the foundation of Clarke's enterprise as Newtonian. Margaret Jacob describes Clarke as the only Boyle Lecturer who possessed the skill necessary to comprehend the *Principia*:

Clarke's lectures rest on many of the same philosophical principles found in Newton's twenty-third query to the *Optice* (1706). Even so they only treat in a more sophisticated and subtle manner the assumptions and arguments made by Bentley in 1692 . . .¹⁴

The 'philosophical principles' to which Jacob refers are those relating to Newton's concept of motion and force which subsequently formed part of the thirty-first Query to the *Opticks* (1718). However, the view of matter and motion which Jacob claims derives from Newton was a commonplace even in 1692, the year of the first Boyle Sermons. The notion that matter was 'lifeless' was an anti-Epicurean tactic and not peculiar to Newton.¹⁵ Jacob also claims that Clarke's use of the concept of universal gravitation was the primary motivation driving the 'Newtonian definition of the relationship between man and matter'. God controls and orders matter by means of the law of attraction which is His will operating on brute matter: man in his material pursuits imposes an analogous order 'similar to that imposed on nature by God'.¹⁶ Jacob concludes

[t]he Physical principles explained mathematically by Newton in the *Principia* offered to churchmen what appeared to them as undeniable proof of God's providence . . . Their system only began with the physical principles explained in the *Principia*. They knew that ultimately events in the natural realm hinged directly upon events in the "world politick." Their aim was to construct both a physical and moral model, a social ideology grounded upon Newton's science, that would bring about the [R]eformation.¹⁷

Apart from the fact that it is - and has been - the perennial aim of 'churchmen' to maintain physical and social order, this assessment of Clarke's programme says nothing of his choice of method nor of the precise use made of Newton's natural philosophy. Jacob's overall exegesis of the Boyle Sermons relies on the assimilation

¹⁴ *NER*, p. 178.

¹⁵ The view that matter is inactive and that all its activities are nothing but God's ordinary operations, can be found in Augustine. See Ezio Vailati, 'Leibniz and Clarke on Miracles', *J. Hist Ideas*, 33 (Oct., 1995), 363 - 91, fn. 8.

¹⁶ Jacob, *op. cit.*, pp. 188 - 89; pp. 191 - 92.

¹⁷ *Ibid.*, p. 192.

of the polysemous terms 'material/matter', 'order' and 'law' under an ambiguously labelled 'Newtonian social ideology'. The resulting unified system is no more than the historian's creation as the analytical terms could be applied almost without restriction to any discourse of the period. The need to form analogous connections between the terms of the *Principia* and Clarke's method is evident in another discussion which clearly demonstrates how the reliance on ambiguity and polysemy is exploited simply to retain Newton's role as Clarke's philosophical source.

Michael Buckley offers a penetrating analysis of the method and content of Clarke's Boyle Sermons, arguing how the metaphysicians and natural theologians appropriated - without complaint from the theologians - the defensive duties of divinity.¹⁸ Clarke, in Buckley's analysis, acts as the archetypal natural-theologian utilising the findings of a 'Universal Mechanics' in the service of rational proofs for the existence and attributes of God. This is unquestionable and it is only when Buckley details the relationship between Clarke's method and the method of Newton's mechanics that the meanings of terms and the analogies become strained. For example, according to Buckley when Clarke described his categories of atheists he was drawing on Newton's distinction between the real and apparent. Clarke stated that he was only concerned with real atheists - speculative atheists - and Buckley concludes that

Atheism, then is to be defined [by Clarke] in a manner very similar to real motion, and it allows for a treatment or method kindred to that which Newton used so successfully in the *Principia*.¹⁹

The analogous use of the term 'real' in this case is somewhat strained, and nowhere does Clarke compare a real atheist with a real motion. Furthermore, the application of Clarke's mathematical method is contrasted by Buckley with the method of Descartes, for whom, 'all scientific method is finally mathematics'. Whereas for Newton, Buckley argues, 'mathematics is a part of mechanics and used to measure and demonstrate'.

Any Cartesian could recognise that another methodology is involved, one that had arisen long since to challenge the master. It is the voice and influence of Newton in the theology of Clarke.²⁰

¹⁸ Michael J. Buckley, S. J. *At the Origins of Modern Atheism* (New Haven/London, 1987), esp. pp. 166 - 93. For a more detailed discussion of the philosophical issues involved, see *idem.*, *Motion and Motion's God: Thematic Variations in Aristotle, Cicero, Newton and Hegel* (Princeton, 1971).

¹⁹ *Ibid.*, p. 172.

Thus Clarke's application of the mathematical method in metaphysics - although a typical Cartesian move - is converted into the application to theology of a 'Universal Mechanics', thereby allowing the term 'mechanics' to substitute in place of the term 'mathematical'. Buckley refers to Newton's method as a 'twofold *derivatio*' - the method of analysis and synthesis - which first determines the underlying causes, or forces, of nature, and from these principles demonstrates the phenomena. Roger Cotes is then quoted (preface to the second edition of the *Principia*) to show how Newton's work was perceived as the best protection against atheists and from which 'missiles' were to be drawn 'against the band of godless men'. Buckley identifies the 'missiles' as the twelve propositions of Clarke's Sermons which analytically established the being of God (analogous to the 'forces' of Newtonian mechanics) and then deduced (synthetically) his necessary attributes (the phenomena).

Although Buckley offers an excellent analysis of the substance of Clarke's Sermons we must question his claim that the foundations of Clarke's *method* were Newtonian.²¹ Buckley's general thesis, that atheism became a *philosophical* problem - that evidence used in the discussions was drawn from philosophical quarters - demands a major role for Newton. As he says,

Philosophy has become the natural philosophy of Newton. Now this philosophy serves as evidence not only against the atheists, but to establish the credibility of Scripture. Science now grounds not only philosophy but theology.²²

According to Buckley, the resulting hegemony of Newtonian philosophy over what were formerly theological questions, was made possible by Clarke's deployment of the Newtonian method in Divinity. However - quite apart from the rather strained analogies used in Buckley's interpretation - I will also argue, in section 6. 3, that the method was not particularly Newtonian, and that the use of the mathematical way as a means of attaining certainty preceded Descartes, who was responsible for its

²⁰ *Ibid.*, p. 173.

²¹ It is difficult to comprehend the oversight on the part of a scholar of Buckley's status regarding the history of the method of analysis and synthesis. There is not a single reference to the foundational work of Neal Gilbert on the history of 'method', which traces its development from the ancients, particularly Plato and Aristotle, to the seventeenth century. See. Neal W. Gilbert, *Renaissance Concepts of Method* (New York/London, 1963).

²² Buckley, *op. cit.*, p. 192.

contemporary formulation.²³ Relying on ambiguous analogies and ill-defined terms, Buckley, in an effort to circumscribe Clarke's performance within a programme exemplified by Newton's 'Universal Mechanics', misinterprets both Newton's and Clarke's aims. Newton did not envisage his mathematisation of mechanics to be a universal method, with applications in other fields such as Divinity. However, Descartes and Clarke both insisted on the possibility of a universal application of the mathematical way.

6. 2. The Choice of Clarke as Boyle lecturer.

Clarke's appointment as chaplain to John Moore, the Bishop of Norwich, provided him with the essential patronage necessary to make his inroad into Anglican scholarly circles.²⁴ He was introduced to the Bishop through William Whiston who at the time of their first encounter was chaplain to Moore.²⁵ At this meeting, Clarke and Whiston discussed the former's proposed translation of Rohault, and Whiston was so impressed with Clarke's knowledge of the *Principia* that he informed Moore of Clarke's potential. Clarke's father was an alderman in the city of Norwich and according to Whiston of a 'most excellent Character' so that both Clarke and his father were invited to the Bishop's palace. This invitation by a prelate who was a 'Patron of Learning, and learned Men', launched Clarke into the favour of the Bishop, and would eventually procure for him the living of St. Bennet's, Paul's Wharf, a chaplaincy to Queen Anne, and the Rectorship of St. James' Westminster.²⁶

As Whiston received further preferment from Moore he resigned his chaplaincy in 1698:

²³ I realise that the nature of Descartes' application of mathematics to other fields of inquiry is not unproblematic. On this problematic question of Descartes' method, see John Shuster 'Descartes' *Mathesis Universalis*: 1619 - 28', in Stephen Gaukroger, ed., *Descartes: Philosophy, Mathematics and Physics* (Sussex, 1980), pp. 41 - 96. However, I am using the term 'method' in the sense of a generally perceived possibility of mathematising other disciplines: the question of its actual application is outside the scope of this thesis.

²⁴ On Moore, see *DNB*. Clarke dedicated the first edition of his translation of Rohault's *Physique* to Moore. He also published Moore's sermons, see John Moore, *Sermons on Several Subjects. By the Bp. of Ely*, ed., Samuel Clarke (2 vols., London, 1715 - 16).

²⁵ Whiston, *op. cit.*, pp. 4 ff.

²⁶ Moore, who was a Whig, had been appointed to the see of Norwich on the deprivation of the Non-juror William Lloyd, to the great annoyance of Anne. However, her acceptance of Clarke as her chaplain shows how political boundaries were not rigidly observed in areas where politics played little or no role.

Accordingly Mr. *Clarke* was admitted as his Chaplain in my stead, and that I suppose about the end of 1698, or the beginning of 1699: In which Post he continued for several Years.²⁷

At this juncture Clarke undertook the study of theology, studying the Old Testament in Hebrew and the New Testament and the early Fathers in Greek. Ferguson says,

[i]n this way Clarke acquired that extensive knowledge of Scriptural texts and the writings of the early ages of the Church of which he was to make so much use in the controversies of his later life.²⁸

No doubt Clarke was assisted in his efforts by the remarkable library amassed by Moore - just as Bentley had been fortunate in the house of his own patron and employer. Hoadley described Moore's library as 'one of the noblest private collections of books which ever appeared in England'.²⁹ It was not long before Clarke began to publish theological works: his *Three Practical Essays upon Baptism, Confirmation and Repentance*. appeared in 1699, *Some Reflections on that Part of a Book called Amyntor* appeared in the same year, and *A Paraphrase on the Four Evangelists* in 1701 - 2.³⁰ The first volume of the *Paraphrase* - the Gospel of Matthew - was dedicated to Tenison. Clarke, in terms strikingly reminiscent of the wording in Boyle's bequest, praises Tenison:

by . . . wise Government and pious Example, you support and encourage true Religion and Virtue; which seems to be in great Danger, not only from bold pretenders to *Atheism* and *Deism*, but even from the many Controversies about smaller matters, raised and uncharitably managed among *Christians*, while little regard is had to the great Duties and most essential parts of Religion.³¹

²⁷Whiston, *op. cit.* p. 5. Hoadley says Clarke spent almost twelve years as Moore's chaplain. See Ferguson, *op. cit.*, p. 8.

²⁸*Ibid.*, p. 9. Details of Clarke's various controversies can be found in Ferguson, *The Philosophy of Dr. Samuel Clarke*, *passim*.

²⁹The *DNB* article lists those scholars who benefited from the patronage of Moore - Bentley, Barret, Strype, Clarke, Whiston, and Samuel Knight. There were twenty nine thousand books and nearly one thousand eight hundred manuscripts in Moore's library at the time of his death. Moore's generosity was particularly directed toward Richard Bentley, see Monk, *op. cit.*, *passim*.

³⁰*Three Practical Essays on Baptism, Confirmation, and Repentance. Containing Full Instructions to a Holy Life; With Earnest Exhortations, especially to young Persons, drawn from the Consideration of the Severity of the Discipline of the Primitive Church* (London, 1699); *Some Reflections on that Part of a Book called Amyntor, or, The Defence of Milton's Life, which relates to the Writings of the Primitive Fathers and the Cannon of the New Testament: In a Letter to a Friend* (London, 1699). *A Paraphrase on the four Evangelists. Wherein for the clearer understanding of the Sacred History, the whole text and paraphrase are printed in separate columns against each other. With critical notes on the more difficult passages. Very useful for families.* (2 vols., London, 1701 - 2).

³¹Clarke, *Works*, iii, 'Dedication'. The paraphrase of Mark's Gospel was dedicated to Moore.

The decision to dedicate the work to Tenison was probably at the instigation of Moore, and it was Moore's connections with the Archbishop which helped to acquire the Lectureship for Clarke. The relationship between Moore and Tenison is difficult to establish. However, some indication of their mutual interests and personal closeness can be seen from Tenison's nomination of Moore as one of nine trustees responsible for the management of an educational endowment.³² These trustees included Tenison (who presided) Wake, and Isaac Newton. The money - five hundred pounds - was to be invested in land and property for the purpose of constructing a public chapel, or oratory. Furthermore, in 1705 Tenison found himself compromised by the interference of Queen Anne in her efforts to secure the promotion of Tory or High Church prelates to bishoprics. According to Carpenter, in his confrontation with Anne, Tenison was, 'assisted by the Bishops of London, Salisbury, Norwich [Moore], and Chichester'.³³ Moore's help was also solicited by Tenison in the latter's attempts to ensure a Whig successor for the bishopric of Norwich on Moore's translation to the see of Ely. It was Tenison who promoted Moore's entry onto William's Commission for recommending fit persons to ecclesiastical preferment; Moore filled the position held by the death of Stillingfleet. Tenison also appointed Moore as his 'Metropolitan' in the later 'Convocation controversy' during the struggles between the Upper and Lower Houses.³⁴ The importance of this position provides some evidence of the relationship between Moore and Tenison. In view of these connections it is not unwarranted to suggest that Moore had a hand in recommending his talented chaplain to Tenison as a likely candidate for the Boyle lectureship.³⁵

Clarke's early theological works, particularly his *Three Essays*, could also have contributed to his growing scholarly status. In his discussion of 'Confirmation' (in the *Three Essays*) he outlined a procedure whereby the catechumen can attain a faith

³² Carpenter, *Life of Tenison*, p. 29. The nomination took place in 1700.

³³ *Op. cit.*, p. 179.

³⁴ The term 'metropolitan' means that Tenison had appointed Moore to oversee the bishops, that is he had equivalent powers to the Archbishop. It is not clear how long this appointment lasted.

³⁵ Clarke's attack on the notorious Toland in his 'Reflections on Amyntor' would also have contributed to his chances of being selected.

which is 'firm and well grounded, and immovable against all Assaults'.³⁶ This method was composed of 'three Steps': first, a working within the mind to attain to a 'full and perfect Conviction of the *Being of God*, and of the *Excellency of his Attributes*'; secondly, to 'collect the Certainty of God's Providence over Men', and thirdly, to perceive the obligations of our duty and the necessity of a revelation from God which was necessary to establish 'true Religion'.³⁷ All these, Clarke says, must be fixed by 'deep and constant Meditations'.³⁸ Thus the general programme and the divisions of the various kinds of proofs of the Boyle Sermons play significant roles in Clarke's early theological works.³⁹ These procedures were not peculiar to Clarke, yet his understanding of them and his ability to deal clearly and methodically with such crucial issues would not have gone unappreciated by Tenison, who at the time of Clarke's performance in the Lectureship was in complete control over the choice of lecturer.⁴⁰

³⁶ *Three Practical Essays*, in *Works*, iii, p. 574.

³⁷ *Ibid.*, pp. 574 - 75. In his 1706 Boyle Sermons, Clarke continued to argue for the necessity of a revelation from the failure of the ancients to fully understand their duty to God solely through the power of reason.

³⁸ The very same steps are found in Clarke's posthumously published *An Exposition of the Church Catechism* which was published from Clarke's unaltered manuscript by his brother John Clarke, the Dean of Sarum. John Clarke delivered the Boyle Sermons in 1719 and 1720, continuing the attack on the view that matter is a necessary principle, see *An Enquiry into the Cause and Origin of Evil: In which the Principal Phaenomenon of Nature are Explained, according to the True Principles of Philosophy: More particularly In Answer to Mr Bayle, and other Defenders of the Ancient Manichaeian Scheme of Two Independent Principles. Being the Substance of Eight Sermons preached at the Parish Church of Saint Mary Le Bow, in the Year 1719. At the Lecture founded by the Honourable Robert Boyle Esq.* in Letsome and Nicholl, *op. cit.*, iii, pp. 152 - 211. John Clarke, in his first series, made more use of Newton than did Samuel Clarke: an analysis of his Sermons would add to our understanding of the use of natural philosophy in defensive theology. However, this would have to take place within a different context as by this time Tenison was dead and control of the Lectureship had passed into the hands of other Trustees.

³⁹ Clarke, in his opening remarks of *The Scripture Doctrine of the Trinity*, described how evidence must correspond to the science under consideration, 'As in Matters of Speculation and Philosophical Inquiry, the only judge of what's right or wrong, is Reason and Experience; so in matters either of human Testimony or divine Revelation, the only certain Rule of Truth is the Testimony or the Revelation itself'. See *Works*, iv, p. i. Clarke was only following a traditional scheme for marshalling evidence. Isaac Barrow, for example, in his sermons on the article of the creed 'I Believe in God' demonstrated the existence of God from the world, human nature, universal consent, and from miracles. See Irène Simon, 'The Preacher', in Feingold, *op. cit.*, pp. 303 - 32, esp. pp. 310 - 11. Simon also provides an excellent discussion of Restoration preaching in *Three Restoration Divines: Barrow, South, Tillotson* (2 vols., Paris., 1967 & 1976).

⁴⁰ Evelyn describes visiting Tenison at Lambeth - 'concerning my suffrage for a Chaplaine [Clarke] of the Bishop of Norwich to be the next lecturer for Mr. Boyle's sermons', de Beer, *op. cit.*, v, p. 536. He also writes of 'My L. of Cant. [Tenison]: wrote to me for my suffrage for Mr. Clarks [sic] continuance another yeare in the Boyle Lecture, which I willingly gave for his excellent

6. 3. Clarke's Sermons and the 'Mathematical Way'.

The discrepancy between the standard view of Clarke and the form and content of his Sermons is grounded on two fundamental misunderstandings. Firstly, there is the tendency to focus on Clarke as a 'natural theologian' - typical of the physico-theologians of the seventeenth century - and, secondly, his use of the term 'Mathematical' has been misinterpreted. These two errors have led some commentators to claim a Newtonian basis to Clarke's Sermons. Thus, the standard exegesis of Clarke's performance is maintained by consistently ignoring his own clearly-expressed programme and by failing to deal with the method and the content.

It is important to be clear from the outset that the term 'natural theologian' is misapplied by Jacob to Clarke when used in the sense of utilising the natural world as an exegetical sign-system which 'speaks' of divine activity. Clarke does very little of this in his 1704 Sermons and when he does he distinguishes clearly between this method of proof - *a posteriori* - and his own chosen method which was demonstration *a priori*. Thus Clarke's natural theology is a theology discovered by the application of human reason as distinct from revealed theology which can only be the product of an immediate theophany, that is from the Word of God.⁴¹ The failure to bear in mind this simple but crucial distinction has allowed commentators to appropriate Clarke's performance as supportive of an ideologically driven historiography, blind to even the most obvious features of his Boyle Sermons. For example, a quick survey of the content of the Sermons shows that passages from Newton were only used in the arguments *a posteriori*, where Clarke also used other authors - both ancient and modern - supporting the fitness and order of things to their ends. Moreover, the use of Newton's principles amounts to no more than half a page in 55 folio pages. Yet, James and Margaret Jacob assert that Samuel Clarke was the Boyle Lecturer's 'most philosophically gifted spokesman', who demonstrated how Newtonian physics supported 'the social ideology and political goals of the liberal Anglicanism which had been rendered supreme within the recently secured church'. Clarke was instrumental in showing how

performance of the past year', *ibid.*, v, p. 583. The letter from Tenison is in Bray, *op. cit.*, iii, p. 399.

⁴¹ It is difficult to classify Clarke's first series of Boyle Sermons as his materials came from disciplines which dealt with distinct subject matters - Metaphysics, Theology and Natural Philosophy.

[t]he same God whose laws of motion Newton had discerned in the natural world would also inevitably insure order, prosperity, and conquest and maintenance of empire in the political world.⁴²

Many other historians have continued to assent to the Jacobs' assertions. For example, Larry Stewart - whilst dissenting from the position that the Boyle Lectures were a 'Newtonian vehicle' - retains 'little doubt that the early Newtonians were anxious to accept access to a polite audience afforded by the lectures'.⁴³ He argues - conflating the various meanings of natural theology - that it would be 'fairer' to describe the Boyle Lectures as 'an extension of the designs of natural theologians'.

More specifically, he maintains how

Clarke's own sermons reveal a foundation that had been constructed by natural theologians in the seventeenth century. This was the tradition to which the Boyle Lectures truly belonged. In his sermons in 1705, Clarke stated clearly the proposition that was at the root of all their physicotheology: "A constant and sincere observance of all the Laws of Reason and Obligations of Natural Religion, will unavoidably lead a Man to Christianity . . .". And the basis of this reason was to be in the observations of nature and the creation. This he [Clarke] had sought to demonstrate in his sermons of the previous year through reference to, among others, Boyle, Ray, and Newton.⁴⁴

In this passage, Stewart conflates the distinctive 'methods' employed by Clarke in his two series of Sermons. Stewart is quoting from Clarke's second series where Clarke answered the Deists' misplaced demand for certainty. Clarke explained how

the same demonstrative *Force* of reasoning, and even *Mathematical* Certainty, which in the main Argument [his 1704 Sermons] was there easy to be obtained, ought not here to be expected; but in such *moral* Evidence, or mixt Proofs from Circumstance and Testimony, as most matters of Fact are only capable of, and wise and honest Men are always satisfied with, ought to be accounted sufficient in the present Case.⁴⁵

As the deists 'pretend to own all the Principles of Reason' and claim to deny nothing

⁴² James R. Jacob and Margaret C. Jacob, 'The Anglican Origins of Modern Science: The Metaphysical Foundations of the Whig Constitution', *Isis*, 71 (1980), 251 - 67, p. 264.

⁴³ Stewart, *op. cit.*, p. 75.

⁴⁴ *Ibid.*, p. 75. Stewart concentrates on the Newtonian ethos of the Lectureship but actually points out that certain of the Lecturers were critical of the use of natural philosophy. He goes so far as to state, 'few of the Boyle lecturers like Samuel Clarke and William Derham were to explicitly employ Newton's natural philosophy'. *ibid.*, p. 64.

⁴⁵ Clarke, *A Discourse concerning the Unalterable obligations of natural Religion and the Truth and Certainty of the Christian Revelation* (London, 10th. ed., undated), p. 11. On the notion of moral evidence, or moral certainty, see Barbara J. Shapiro, *Probability and Certainty in Seventeenth-Century England: A Study of the Relationship between Natural Science, Religion, History, Law, and Literature* (Princeton, 1983).

but what is entirely dependent on 'Testimony and Evidence of Matter of Fact', Clarke, in this series, answered their critique of the matters of fact of divine revelation - credible testimony of miraculous fact and the testimony of the best of the pagans was moral proof that reason was an insufficient means for complete access to the will and purpose of the deity. Thus if the deist adhered to all the consequences of his own principles he ought to be led by the obligations of natural religion to profess Christianity: this - not the observation of nature and creation - is the context of Stewart's quotation. Only in the first series did Clarke draw on natural philosophy, and then when he was arguing *a posteriori*: this is also true of his discussion of 'gravity' in the opening assault on the deists in the second series.⁴⁶ In his haste to include Clarke with the physicotheologians, Stewart ignores statements made by Clarke regarding his own methods and substantive materials.⁴⁷ Thus in his reliance on discursive commonplaces, drawn from a particular historiography, Stewart precludes a close reading of Clarke's text. This approach has continued the occlusion of Clarke's methodical programme which offered a tripartite division of evidence, with evidentiary materials arranged in their appropriate places. This 'natural order' of proof began, just as it did in Descartes, with *a priori* demonstration of God's existence.

Historians have also been misled by Clarke's use of the term 'Mathematical'. In the Preface to the published Sermons he alluded to the 'many good Books' already

⁴⁶ Gravity was used to argue for the creation of the world and the continual providence of God, and *not* as a proof of God's existence. This is obvious from the context, where Clarke argued against the supposed belief in the existence of God by Deists who exploited Descartes view - God only created matter and a quantity of motion and then left the world to form from mechanical chance. Clarke did call on the support of natural philosophy in his second series (Letsome and Nicholl, *op. cit.* ii, pp. 155 - 6). In discussing the doctrine of the Resurrection of the Body, which is a doctrine dependent for its certainty on Revelation, Clarke deployed evidence obtained from the microscope, and from the concept of 'seminal principles'. These were not arguments from design and were only offered *ex suppositione*, to show that there was nothing contrary to reason in the doctrine of the Resurrection. Stewart also conflates the various uses of the term 'Reason' so prevalent in this period. Clarke argued that the foundation and the ground of all 'Reason' was the concept of 'Necessity', which was prior to and the essential foundation of even the supreme self-existing being. These necessary 'Rules of Right Reason' should not be conflated with the prioritisation of human reason in investigating natural causes.

⁴⁷ Clarke was primarily a theologian and metaphysician. The published versions of his two series of Boyle Sermons constitute a metaphysical tract (1704 Sermons) and a work of moral theology (1705 Sermons). Stewart's claims, that Clarke built his metaphysics on the 'commonly accepted argument for the existence of God' (the argument from design), and that his 'forays into the recesses of metaphysics took [his readers] far beyond the comfortable realm of abundant nature to which they had been made accustomed' ignores Clarke's self-perception as a metaphysician.

in existence which attempted to prove the Being and Attributes of God, but asserted that his own approach would be different.

*I have chosen to contract what was requisite for me to say, upon this Subject, into as narrow a compass, and to express what I had to offer, in as few Words, as I could with Perspecuity. For which Reason I have also confined myself to One only Method or continued Thread of Arguing; which I have endeavoured should be as near to Mathematical, as the Nature of such a Discourse would allow.*⁴⁸

Clarke's aim was, therefore, to achieve certainty in matters which were criticised for their inability to compel assent. Only mathematics and geometry could provide this certainty and level of commitment. However, Newton had not applied this method to Theology.⁴⁹ Although the order in the system of the universe could suggest an ordering power, it could not prove the being of God with mathematical certainty. Furthermore, the possibility of a mathematical demonstration of God's existence had come under fire from Anglican divines during the latter half of the seventeenth century. John Tillotson in discussing the various kinds of proof and their appropriateness to particular *scientia* says

[t]he Being of a God is not *mathematically* demonstrable, nor can it be expected it should, because only mathematical matters admit of this kind of evidence.⁵⁰

Seth Ward had likewise criticised this method. Ward explained how there were only three ways 'imaginable in Nature' to give a rational or philosophical demonstration of the truth of the gospel. These were the *a priori*, *the a posteriori*, and Revelation. Ward's comments on the *a priori* - which he labelled the 'Grecanic or Philosophical *Postulatum*' - are worth quoting in full.

To prove anything concerning the Essence and Nature of God *per causas*, by Arguments *a Priori* supposes causes precedent to the Essence of God

⁴⁸ Letsome and Nicholl, *op. cit.*, ii, Preface to Clarke's Sermons. Original in italics.

⁴⁹ The only place in the first edition of the *Principia* (Bk. III, Prop. viii, Collorary v) which relates a physical truth to the operation of God is to be found in Newton's discussion of the relative distances of the planets from the Sun. God placed the planets so as to receive heat according to their densities. Clarke listed this in his discussion of the discoveries of 'modern' astronomers. See, Michael J. Buckley, 'God in the Project of Newtonian Mechanics', in G. V. Coyne, S. J. M. Heller, and J. Zycinski eds., *Newton and the New Direction in Science* (Vatican City, 1988), pp. 85 - 105, p. 85 - 6. In this paper Buckley criticises Strong's argument that it was only in the 1713 edition of the *Principia* that theological issues played a significant role in Newton's thinking. See, E. W. Strong, 'Newtonian Explications of Natural Philosophy', *J. Hist. Ideas*, 18 (1957), 49 - 83.

⁵⁰ *The Wisdom of Being Religious. A Sermon Preached at St. Paul's* [on Job xxviii, 28], (London, 1664), in Paul Elmer More and Frank Leslie Cross, eds., *Anglicanism: The Thought and practice of the Church of England, Illustrated from the Religious Literature of the Seventeenth Century* (London, 1957) p. 229.

himself, and implies a contradiction; so then, the Greecanic or Philosophical Postulatum proceeds from Ignorance and want of Learning, and is at best disingenious [sic] and theoretically absurd.⁵¹

Furthermore, it is not the case that Ward was against demonstration *per se*, or of the use of it by divines in agonistic contexts.⁵²

John Wallis also criticised Hobbes for raising ‘an expectation’ that he had rendered ‘all Philosophy as Clear, and Certain, as Euclid’s *Elements*’. However, the ‘mathematical divines’ had, according to Wallis, turned Hobbes’ weapons against him.

The first fall upon his *last Resource*; and Rout his *Mathematicks*: (beyond a possibility of *Rallying*.) And, by *Firing* his *Magazine* upon the first Assault, make his own Weapons *Fight against him* . . . And, because he Talks so much of *Accurate Method*, *Legitimate Demonstrations*, and other the like fine words, (which what they signifie with Geometricians is understood).⁵³

Thus, reducing knowledge to clear and certain notions and proceeding in a mathematical deduction were the defining criteria of certainty. What was not agreed on all sides was the extent of its usefulness in matters outside ‘Geometry’. The problem was exacerbated by the fact that it was Descartes who had laid down the principles of a method whereby certainty could be obtained in other fields, and that Hobbes and Spinoza claimed to have put that method into practice on theological questions.⁵⁴ In spite of the antagonism of Anglican clerics to both Descartes and the application of the mathematical way in non-mathematical *scientia*, Clarke used the

⁵¹ Seth Ward. *An Apology for the Mysteries of the Gospel* (London. 1673).

⁵² See, *A Philosophical essay towards the Being and Attributes of God [the] Immortality of the Souls of Men [The] Truth and Authority of Scripture* . . . (London, 5 th. edition, 1677), ‘To The Reader’, unpaginated. Ward’s demonstration of God’s attributes began with the ‘Necessity’ of God and worked through the standard list, exactly as Clarke would do in his Boyle Sermons. Thus, the similarity in content and order between Ward’s and Clarke’s demonstration highlights their complete divergence over the correct method. Ward accused Hobbes of ‘having much injured the Mathematicks, and the very name of demonstration, by bestowing it upon some of his discoveries, which are exceeding short of that evidence and truth which is required to make a discourse able to bear that reputation’.

⁵³ *Hobbius Heauton-timorumenos: or, A consideration of Mr. Hobbes his Dialogues. In an Epistolary Discourse, Addressed to the Honourable Robert Boyle* (Oxford, 1662), p. 9.

⁵⁴ Hobbes contrasted what he considered necessary in philosophy - ‘method’ - with mere ‘ingenuity’ as practised by Boyle and the members of the Royal Society. See, *Leviathan and the Air Pump*, p. 129. Hobbes also had an interesting slant on the method of analysis and synthesis: the faculty of ‘invention’, or seeking out causes of some effect, was ‘guided and regulated’ when the mind sought, either a cause of an effect (common to man and beast) or, when the mind sought all possible effects of a thing (common to man only). *Leviathan*, in *Works*, iii, p. 13 - 14. Hobbes was utilising the fact that the terms ‘method’, ‘seeking’ and ‘invention’ are etymologically linked.

method whilst dissenting from the content of Cartesian cosmology and natural philosophy.

Furthermore, in order to show that Buckley's argument for the Newtonian origins of Clarke's method is unfounded we need to examine the claim that the method of analysis and synthesis was Newtonian. Neal Gilbert has shown that this method has a long history preceding Newton's articulation of it. Moreover, as the following example of John Williams shows, this method could be used by a theologian who was antipathetic to the natural theology.⁵⁵

John Williams delivered the Boyle Sermons (twelve in total) over the two years of 1695 and 1696. His overall programme was to establish the necessity, the certainty, the truth and the divine authority of the scriptures. Thus, just as Clarke was to do almost a decade later, he dealt with the problem of certainty. His first Sermon, 'The Possibility, Expediency, and Necessity of Divine Revelation', expanded the text which he used for all eight Sermons in the year 1695 to demonstrate the insufficiency of 'Natural Means' in dispelling ignorance.⁵⁶ According to Williams there are two ways by which we attain to knowledge - viz., 'Natural or supernatural'.

Natural, is what we have springing up with our Faculties, or what we attain by Natural Means, by Sight, Observation and Experience, by Tradition (which is the history of others Observation and Experience;) and lastly, by Reason and Argument, *deducing Effects from their proper Causes, or finding out the Cause by its Effects*: as for Instance; thus we come to the Knowledge of God by observing the Frame of the World, by the Series, Order, and Course of Things, which could never be without some Cause to produce them, and that Cause no less than one infinitely Powerful and Wise . . . Such Inferences as these, are as natural to a Reasonable Mind, as those Observations are which we make from the Reports of Sense; and are therefore deservedly accounted Branches of Natural Religion.⁵⁷

This kind of understanding, Williams continued, depended on the 'Capacities and Dispositions of Mankind' and the opportunities and means which any individual had for acquiring the necessary information. Assuming this prerequisite, we may also

⁵⁵ On method in seventeenth-century Anglican theology see, Henry R. McAdoo, *The Spirit of Anglicanism: A Survey of Anglican Theological Method in the Seventeenth Century* (London, 1965), *passim*; Henry G. Van Leeuwen, *The problem of Certainty in English Thought, 1630 - 1690* (The Hague, 1963), esp. pp. 13 - 31.

⁵⁶ Letsome and Nicholl, *op. cit.*, vol. i, p. 155. The text was the First letter to the Hebrews, 1: 2., *God, who at sundry Times, and in divers Manners, Spake in time past unto the Fathers by the Prophets, Hath in thes last days spoken unto us by his son.*

⁵⁷ *Ibid.*, p. 155, my emphasis.

assume, that the 'Philosopher' who inquired into the 'Mysteries of Nature . . . may, in Reason, be supposed to be more confirmed in the Belief of a God, and more disposed to serve and adore him, than he that is ignorant'. At this point Williams appears ready to pursue the supportive role which an inquiry into the natural world offers belief and piety. However, he proceeded to define the boundaries beyond which reason and nature cannot carry us: where *a fortiori* natural religion could not overcome the insufficiency of unregenerated human nature.

But after all, so much is the Subject [natural inquiry] above our Reach, and so dark and intricate are all our Reasonings upon it, that the sagest Philosopher, in the Conclusion, is left as unsatisfied as the meanest Peasant: and perhaps more unsatisfied with his Knowledge, and the deep and unfathomable Abyss he sees before him, than the other is with his Ignorance; So far making good what *Solomon* observes, *He that increaseth Knowledge, increaseth Sorrow*, Eccles., 1. 18. So that there needs some brighter Light than that of Nature, to conduct us to Happiness, and bring us to a compleat and entire Satisfaction; and that is a Supernatural Knowledge, a Knowledge that is not to be obtained by the Ways aforesaid, by Enquiry and Observation. but by Inspiration and Revelation from Almighty God.⁵⁸

Although the pursuit of certainty and the method of analysis and synthesis were common to both Clarke and Williams, they were engaged in entirely different programmes: irrespective of their independent aims their methods and taxonomies of proof do not have their origins in a common Newtonian base. The example of Williams also shows that the method of analysis and synthesis cannot be tied exclusively to Newton's writings.

The problem of ascertaining the origins of a method of certainty is exacerbated by the varying attitudes amongst divines towards the role of reason in theological discourse. Clarke's Sermons were offered within a culture which had an ambiguous attitude to 'humane' learning and the use of the natural faculties of reason and the powers of the understanding. There was also an intense awareness and publicising of humanity's sinful nature throughout the seventeenth century, both in Puritan and in Anglican theological texts. Weak, sinful, vitiated human reason produced weak 'effete', or effeminate, 'notional' knowledge, which was ascribed to the atheist and the reprobate (and, of course, scholastics). By contrast, manly and useful learning was the result of a lively piety and an experiential, as opposed to mere

⁵⁸ *Ibid.*, pp. 155 - 6.

notional, knowledge of the world.⁵⁹ Yet, Clarke chose the notional way, replete with the terminology of the schools.

We must also recognise that Clarke was principally a metaphysician. Clarke's proofs of the being and attributes of God were not proofs for the distinctive doctrines of Christianity - the Incarnation, Crucifixion and Resurrection of Christ - but proof within an area traditionally covered by *a priori* certainty. Aquinas, for example, had characterised the traditional role of reason (in opposition to things above reason).

There is a twofold mode of truth in what we profess about God. Some truths about God exceed all the ability of the human reason. Such is the truth that God is triune. But there are some truths which the natural reason also is able to reach. Such are that God exists, that he is one, and the like. In fact, such truths about God have been proved demonstratively by the philosophers, guided by the light of the natural reason.⁶⁰

He also made clear the purpose of these demonstrations and his characterisation coheres well with what I have claimed as the major role in agonistic theological texts.

Nevertheless, there are certain likely arguments that should be brought forth in order to make divine truth known. This should be done for the training and consolation of the faithful, and not with any idea of refuting those who are adversaries. For the very inadequacy of the arguments would rather strengthen them in their error, since they would imagine that our acceptance of the truth of faith was based on such weak arguments.⁶¹

Clarke, however, did not consider his proofs 'weak', because Descartes and the tradition from which he drew his own method had aligned the certainty of those things apparent to reason with the certainty of geometry and mathematics. Demonstration, in Clarke's usage, applied only to things which were necessary in themselves - '*necessary in its self, necessary in all Places and at all Times equally*'.⁶²

⁵⁹ For example, Joseph Glanvill described the style of Spratt's history of the Royal Society in the following terms - 'It's *Manly*, and yet *plain*: *natural* and yet not *careless*: the epithets are *genuine*, the Words proper and *familiar*. the Periods smooth and of *middle* proportion: It is not *broken* with ends of *Latin*, nor *impertinent Quotations*: nor made harsh by *hard* words, or *needless terms of Art*; Nor rendered [sic] *intricate* by long *Parentheses*, nor gaudy by slanting *Metaphors*; nor *tedious* by *wide fetches* and *circumferences* of *Speech*. nor *dark* by too much *curtness* of Expression: 'Tis not *loose* and *unjointed*, *rugged* and *uneven*: but as polite and as *fast* as *Marble*; and briefly, avoids all the *notorious defects*, and wants none of the proper *Ornaments* of language'. 'Of the Modern Improvement of Useful Knowledge', in *Essays on Several Subjects* (1676) Essay III, p. 35 - the essays are separately paginated. On Glanvill's own rhetorical theory see, Wilbur Samuel Howell's discussion of his *An Essay concerning Preaching: Written for the Direction of a young Divine* (London, 1678) in, *Logic and Rhetoric in England, 1500 - 1700* (New Jersey, 1958), pp. 393 ff.

⁶⁰ *Summa contra gentiles*, I. 3. 3.

⁶¹ *Ibid.*, I. 9. 2.

⁶² Clarke, *Several Letters to the Reverend Dr. Clarke, From a Gentleman in Gloucestershire, Relating to the Discourse Concerning the being and Attributes of God; with the Doctor's Answers*

If we are to avoid the conflationary moves of Buckley and others, it is crucial, to be clear about the function of the term ‘mathematical’ in Clarke’s stated method. By the time of the *Principia* mathematical knowledge had become, as Peter Dear says, ‘a model for understanding in general, rather than merely a body of techniques capable of especially satisfying forms of explanation’.⁶³ Even for Descartes, ‘the use of quasi-mathematical structures of reasoning usually stands apart from the things reasoned about; mathematics is just another logic’.⁶⁴ Thus, deriving the advantages of a cultural authority but without any specificity of reference. This description of Descartes’ use of the authority of mathematics offers a close parallel with Clarke’s project, where mathematics was simply a deductive logic. Clarke’s close continuous way of reasoning consisted of drawing out logical inferences. Clarke claimed that his method was ‘*as near to Mathematical, as the Nature of such a Discourse would allow*’, not that his method *was* mathematical. However, the force of the authority of mathematics was thereby appropriated without the application of its objects and definitions.⁶⁵

However, Hobbes and Spinoza - Clarke’s main antagonists - had dealt with quantities and their arithmetical combination and had considered this process as the only ground of truth. Although the *Principia* claimed to treat the principles of natural philosophy mathematically, we must appreciate that Clarke mobilised the method not in a continuation of the procedures of Newtonian mechanics but in confuting Hobbes and Spinoza.⁶⁶ Hobbes was explicit in his reduction of the

thereunto. in *Works*. ii, pp. 737 - 58. The quoted passage is from Clarke’s ‘Answer to the First Letter’, p. 740.

⁶³ Peter Dear, *Discipline and Experience: The Mathematical Way in the Scientific Revolution* (Chicago, 1995), pp. 211 - 12.

⁶⁴ *Ibid.* p. 212.

⁶⁵ Isaac Watts’ keen perception of a distinction between the acknowledgement and appropriation of the authority of the mathematical way, and the impossibility of its practice in all fields, is helpful in summarising the problem. See his *Logick, or, The Right use of Reason* (2nd. ed., London, 1726), p. 346.. Watts says, ‘The *antient scholastic* Writers have taken a great deal of Pains, and engaged in useless Disputes about these two methods [analytic and synthetic], and after all have not been able to give such an Account of them as to keep them entirely distinct from each other, neither in the Theory or in the Practice. some of the *Moderns* have avoided this Confusion in some Measure by confining themselves to describe almost nothing else but the *synthetic* and *analytic* methods of *Geometricians* and *Algebraists*, whereby they have too much narrowed the nature and Rules of Method. as tho’ every thing were to be treated in *mathematical* Forms’. Quoted in Dear, *op. cit.*, p. 249

⁶⁶ Newton, in the Preface to the first edition of the *Principia*, says, ‘I have in this treatise cultivated

combination of ideas in general (not just mechanics or optics) to mathematics.

In sum, in what matter soever there is place for *addition* and *subtraction*, there also is place for *reason*; and where these have no place, there *reason* has nothing to do.⁶⁷

Clarke, by his own admission, was forced to apply the method of the algebraist or geometrician as the metaphysical principles of Hobbes were grounded on the priority of definition over authority. Nature could not err, asserted Hobbes, it was only men who produced truth or falsity: in that they followed one continuous train of thought beginning with definitions and axioms and continuing *via* proper combinatorial procedures they were assured of the latter and avoided the former.⁶⁸ Hobbes' critique of those who produced truths without this demonstrative foundation was aimed at a tradition which had relied so heavily on the status of 'authorities'. Clearly defined terms allied to the method of Euclid removed the need for authoritative bodies of knowledge.

For words are wise men's counters, they do but reckon by them; but they are the money of fools, that value them by the authority of an Aristotle, or a Cicero, or a Thomas, or any other doctor whatsoever if but a man.⁶⁹

Clarke's methodical foundations were necessarily mathematical since he had to appropriate the weapon of mathematical certainty in the defence of Christianity. As discussed above, Clarke was tutored by a Cartesian and early in his career he translated a major textbook of Cartesian natural philosophy. Regardless of how much Clarke was impressed with Newton's universal application of geometry to mechanics and astronomy it is inconceivable that he did not perceive - under the tuition of Ellis - the merits of Descartes' method.⁷⁰ Daniel Garber points out that

mathematics as far as it relates to philosophy'. This claim may not be as straightforward as it appears since Mathematics and Natural Philosophy were different disciplines. Thus, *a fortiori* the application of Mathematics to Theology infringed disciplinary boundaries. I have not come across a study which deals with Theology and the precise contours of cross-disciplinary claims in this period. Alan Gaby discusses the relevant historiographical issues in relation to Mechanics. See his 'Between *Ars* and *Philosophia Naturalis*: Reflections on the Historiography of Early Modern Mechanics', in J. V. Field and Frank A. J. L. James, eds., *Renaissance and Revolution; Humanists, Scholars, Craftsmen and natural Philosophers in Early Modern Europe* (Cambridge, 1994), 133 - 46.

⁶⁷ Hobbes. *op. cit.*, p. 30.

⁶⁸ *Ibid.*, p. 25 ff.

⁶⁹ *Ibid.*, p. 25.

⁷⁰ Clarke would have encountered these in Descartes' *Discourse on Method* (first published in 1637). On the fortunes of Descartes in England, see Alan Gaby, 'Philosophia Cartesiana triumphata: Henry More (1646 - 1671)', in J. Lennon *et al.*, eds., *Problems of Cartesianism*

what differentiated Descartes' approach from his contemporaries was the scope of his method and the ordering of the sciences.

Descartes emphasised the interconnectedness of the different branches of knowledge he pursued, the importance of grounding the sciences on one another in the appropriate way.⁷¹

Descartes in his *Principles of Philosophy* delivered what he regarded as the correct order of the sciences: metaphysics was to take priority over all other *scientia*.⁷² The priority of metaphysics, as Garber explains, was of central importance to Descartes': so important was the position of metaphysics that he criticised certain of his followers who abandoned the dependency of physics on metaphysics. Rohault, for example, has no discussion of God and the soul - Descartes' first principles - and Henricus Regius, once Descartes' disciple, was criticised by Descartes for changing the order of the sciences, and for denying certain metaphysical truths on which the whole of Cartesian physics depended.⁷³ For Clarke certain knowledge began with the metaphysical truth of a first cause and then by a series of steps he deduced the attributes of that first cause. Newton's approach is much more akin to those who prioritised physics over metaphysics: it was the truths of physics - of matter in motion, and its attendant laws - which lent probability but not certainty to the metaphysical issue of a first cause and ordering power.⁷⁴ We might conjecture that Newton was reminded of the importance of metaphysical principles by his association with Clarke, and hence their appearance in the General Scholium added to the second edition of the *Principia* almost a decade after Clarke's first Boyle Sermons.⁷⁵

(Montreal, 1982), pp. 171 - 250

⁷¹ Daniel Garber, *Descartes' Metaphysical Physics* (Chicago/London, 1992), p. 30.

⁷² See *Principles of Philosophy*, in *Phil. Writings*, p. 201, where Descartes says, the best path to follow when we philosophise will be to start from the knowledge of God himself and try to deduce an explanation of the things created by him'. See Gary Hatfield, 'Force (God) in Descartes' Physics', *Studies in the History and Philosophy of Science*, 10 (1979), 113 - 40.

⁷³ See Garber, *op. cit.*, pp. 60 - 62, for a full discussion of these issues.

⁷⁴ That this use of Natural Philosophy was traditional, and considered appropriate by the Peripatetics is discussed in Patricia Reif, 'The Textbook Tradition in Natural Philosophy, 1600 - 1650', *J. Hist. Ideas*, 30 (1969), 17 - 32.

⁷⁵ See Edward Strong, 'Newton and God', *J. Hist. Ideas*, 13 (1952), 147 - 67. I am not claiming that Newton was unaware of these issues during the writing of the *Principia*. However, the central passages of the General Scholium provide almost a repetition of Clarke's scheme in his 1704 Sermons: the recital of God's attributes, the distinction between the fact of God's existence and the impossibility of our conceiving the manner of that existence (Newton uses the blind man analogy to signify our inability to perceive the essences of material things), the notion that an attribute must inhere in a substance, the argument against 'Fate' and the support of the complete liberty of the

6. 4. Selected Themes in Clarke's Boyle Sermons.

The most striking feature of Clarke's Boyle Sermons is the substantive differences between the 1704 and 1705 series.⁷⁶ The aim of these sixteen Sermons was to pre-empt all possible arguments of the atheist. Although the first series demonstrated from *a priori* reasoning the existence of a necessary divine being, prior to and therefore the cause of all things, the second series, drawing its evidence mainly from arguments *a posteriori* and the testimony of credible witnesses, particularly the authority of the classical authors Plato and Cicero, sought to demonstrate the universal presence of a natural scheme of order and virtue. This 1705 series dealt with the evidence drawn from history - divine and secular - and from human nature which contained the 'Rules of Right Reason'.⁷⁷ These rules enabled the classical authors to come close to a natural scheme of virtue. However, the crux of Clarke's argument focused on the inability of even the most virtuous of the ancients to discover their complete duty to God. Without divine revelation, reason was simply insufficient to discover our proper relationship with a God of dominion, notwithstanding its power to demonstrate the existence of a supreme being. In the remainder of this section I will, firstly, concentrate on selected themes contained in the twelve propositions of the first series, and, secondly, summarise the general

deity. Other comparisons are drawn by Ferguson in *The Philosophy of Dr. Samuel Clarke*, pp. 251 - 52. This is interesting as we have already seen, in the case of Bentley and Newton, the difficulty in assigning responsibility for particular positions. John Edwards thought that Newton and Clarke had conferred over the General Scholium. See *Some brief Critical Remarks on Dr. Clarke's last Papers; which are his Reply to Mr. Nelson and an Anonymous Writer, and the Author of Some Considerations, etc. Shewing that the Doctor is as deficient in the Critical Art, as he is in Theology* (London. 1714), Postscript, p. 36.

⁷⁶ *A Demonstration of the Being and Attributes of God. More particularly in Answer to Mr. Hobbes, Spinoza and their Followers. Wherein the Notion of Liberty is stated, and the Possibility and Certainty of it proved, in Opposition to Necessity and Fate. Being the substance of eight Sermons, Preached in the Cathedral-Church of St. Paul, in the year 1704, at the Lecture founded by the Honourable Robert Boyle Esq.* (London, 1705). *A Discourse concerning the unchangeable Obligations of Natural Religion, and the Truth and Certainty of the Christian Revelation. Being eight Sermons preached at the Cathedral-Church of St. Paul, in the Year 1705, at the lecture founded by the Honourable Robert Boyle, Esq.* (London, 1706). The edition used here is that found in Letsome and Nicholl, *op. cit.*, vol. iii. the Sermons were published jointly with the title, *A Discourse concerning the Being and Attributes of God, the Obligations of Natural Religion, and the Truth and Certainty of the Christian Religion. In Answer to Mr. Hobbes, Spinoza, the Author of the Oracles of Reason, and other Deniers of Natural and Revealed Religion. being Sixteen Sermons etc.*

⁷⁷ The 1705 series continued the method of proving separate propositions - fifteen in total - even though the evidence for them was not demonstrable but for the most part highly probable. See, Letsome and Nicholl, *op. cit.*, ii, pp. 68 - 71, where Clarke summarises the fifteen propositions.

argumentative strategies of the second series.⁷⁸ We need to discuss these in some detail in order to show that Clarke's arguments were principally metaphysical and that his language was based on the terms of the Scholastics.⁷⁹

The printed text of the first series of Clarke's Sermons has numbered propositions - twelve in all - and numbered corollaries varying from two to four. This approach is very similar to a scholastic handling of a systematic series of 'questiones' and a page of Clarke's Sermons would not look out of place if inserted into the *Summa contra gentiles*.⁸⁰ The twelve propositions were to demonstrate - in order - the existence of a being which was necessary, self-existent, eternal, infinite, one, intelligent, etc. Moreover, natural philosophy does not enter significantly into these metaphysical discussions but only into his *a posteriori* arguments.

In his opening Sermon Clarke offered the usual taxonomy of 'atheists', but he only engaged those who claimed to have arrived at atheism through a process of 'Speculative Reasoning, and upon the Principles of Philosophy'. Against these 'considering Persons' he maintained that his arguments were 'strictly demonstrable to any unprejudiced Mind, from the most Incontestable Principles of right Reason'. Moreover, he would not at this time draw any testimony from Scripture or 'popular Arguments', but by 'one clear and plain series of Propositions necessarily connected and following from one another' he would deduce God's necessary existence.⁸¹

Clarke's foundation for his engagement with the 'speculative atheist' was constructed from what he termed variously as, 'the Rules of strict and Demonstrative

⁷⁸ This thematic approach is in no sense an exhaustive analysis of Clarke's Sermons: it does, however, serve to illustrate the broad outlines of Clarke's overall programme. This approach necessitates that many of Clarke's substantive issues are ignored - such as his arguments on fate and liberty which constitute large sections of his first series of Sermons. The tenth proposition, for example, occupies fifteen folio pages and deals with the infinite power of the 'Supreme Cause of all Things': the corollaries to the tenth proposition dealt with immaterial substances, the ability of the human soul to begin motion, human freedom, and the absolute liberty of God.

⁷⁹ See, Alan P. F. Sell, 'Samuel Clarke on the Existence of God', *Enlightenment and Dissent*, 3 (1984), 65 - 76. Sell comments, 'For all Clarke's "modernity" and his impatience with medieval scholasticism, with its "empty sounds" such as *purus acta* and *mera forma* . . . he was, methodologically, a scholastic' (p. 73). On Clarke's indebtedness to the language of the Scholastics see Ferguson, *Philosophy of Dr. Samuel Clarke*, pp. 243 ff..

⁸⁰ Brian Lawn, *The Rise and Decline of the Scholastic 'Quaestio Disputata': with a Special Emphasis on its Use in the Teaching of Medicine and Science* (Leiden, 1993). According to Lawn the *quaestio*, or disputation, in Theology was 'an invaluable tool for exegesis, combating heresies, and resolving conflicting opinions' (p. 145).

⁸¹ Letsome and Nicholl, *op. cit.*, ii, p. 6.

argumentation: the application of ‘the most uncontestable Principles of Right Reason’, or, the ‘Principles of Reason and Philosophy’.⁸² There was one condition which he laid down as an absolute precondition for the debate. His opponents must abandon all manner of ‘Prejudices’. Clarke, in a combination of the foundational maxims of Descartes and Hobbes, requested that special care be taken with ‘prejudices’, which

have been apt to arise from the too frequent Use of Terms of Art, which have no ideas belonging to them; and from the common receiving certain Maxims of Philosophy as true, which at bottom seem to be only Propositions without any Meaning or Signification at all.⁸³

Thus Clarke defined and circumscribed the arena in which legitimate discourse must be constrained: both he and his opponents were subject to a code of ‘reasonableness’. Clarke’s oratorical character (or *ethos*) was therefore assured by his ‘fairness’ in entering the battle armed only with the weapons of his enemies. He clearly restated the claims of opponents, accepted the unquestionable conditions of mathematical demonstration, scrupulously followed the strategies dictated by his antagonists and (by means of the ‘reductio’) exposed the inability of Hobbes or Spinoza to maintain proper sequential inferences. Clarke’s overall aim was to show that atheists did not have ‘Reason on their side’, but only a ‘vain Confidence, and a great Blindness and Prejudice’. Consequently, even the force of mathematical persuasion could not compel the atheist to abandon his prejudices.⁸⁴ Since reason was a necessary property of the righteous. At the end of his first series of Sermons Clarke summarised and defended his re-appropriation of the methods of the atheist.

But since the most considerable Atheists that ever appeared in the World, and the Pleadors for Universal Fatality, have all thought to argue in this way, in their Attempts to remove the First Foundations of Religion: It is Reasonable and Necessary, that they should be opposed in their own way; it being most certain, that no Argumentation, of what kind so ever, can

⁸² *Ibid.*, p. 6

⁸³ See, Hobbes, *Leviathan*, op. cit., iii, p. 20, on ‘Abuse of Speech’, and *ibid.*, pp. 34 - 5, where he criticises the use, especially by the Schoolmen, of names that ‘signify nothing’. Descartes, in *Discourse on Method*, describes freeing himself from prejudices which obscure the ‘natural light’, see *Phil. Writings*, i, p. 116.

⁸⁴ It is important to be clear on the rhetorical use of the authority of Mathematics. Clarke deployed the predominant cultural trope that only a lunatic or someone completely debauched and without full control of his faculties could resist the compelling power of mathematical demonstration. Continued resistance to the demonstrative truths of Christianity, from those who considered their unbelief to be drawn from the ‘Principles of Philosophy’, would, consequently, be indicative of ulterior motives.

possibly be made use of on the side of Error, but may also be used with much greater Advantage on the Behalf of Truth.⁸⁵

There were many other signs, allied to this power of reasoning, which God had given of himself, including the mind and its power of comprehension and the order, beauty and harmony of the universe. Thus by the end of his sixteen Sermons Clarke had presented the defence of Christianity by bringing before the bar (just as Bentley claimed to have done) all possible forms of proof, so that even those of 'the meanest capacity and greatest Disadvantage whatsoever', who might be affected by the apparent wit and metaphysical power of the atheist, would not be 'shaken and unsettled' by the 'subtile Sophistries of Sceptical and Atheistical men'.⁸⁶

The metaphysical and scholastic arguments in Clarke's first series were aimed at undermining the Cartesian notion of 'extension'.⁸⁷ Like Bentley, Clarke recognised that the identification of extension and matter permitted the possibility that matter was infinite and eternal. - attributes that could only be ascribed to God and were necessary modes of God's being. By focusing on the themes of 'necessity' and the attribute of 'immensity' we can observe how Clarke deployed and converted the Cartesian notion of 'extension' into an anti-materialist argument. The concept of 'necessity' plays such an important role in Clarke's metaphysics that it must be introduced before the theme of 'immensity' is discussed.⁸⁸

⁸⁵ Letsome and Nicholl, *op. cit.*, ii, p. 54. In his summary, Clarke maintained that mathematical reasoning has the power to compel assent even though we are completely ignorant of the detailed points of mathematics. Thus affirming the contrary of a mathematical proposition (such as the three angles of a triangle are equal to two right angles) implies an 'express Contradiction' - hence Clarke's use of the *reductio ad absurdum* - and holding to such a contradiction can only signify a prejudice. The concluding sections of Clarke's second series has a lengthy discussion on the prejudices of the atheist and the weakness of their understandings due to sin.

⁸⁶ See, Clarke's 'Answer to a Sixth Letter', *Works*, ii, p. 751. where he explained how the *a priori* way 'like numberless Mathematical Demonstrations [was] capable of being understood by only a few attentive Minds; because 'tis of Use, only against Learned and metaphysical Difficulties'. This method could no more be made obvious to the generality of men than could Astronomy or Mathematics.

⁸⁷ John Tull Baker long ago drew attention to the importance of the reaction to Descartes' concept of extension in forming theological responses to the problem of God's ubiquity. According to Baker, Descartes, in making extension the essence of matter, conferred on matter 'one of the most necessary attributes of God'. It was in reaction to Descartes that Henry More conceived of the notion of 'divine extension', and equated space with the ubiquity and immensity of God. See, *An Historical and Critical Examination of English Space and Time Theories from Henry More to Bishop Berkeley* (New York, 1930). Compare, Brian P. Copenhaver, 'Jewish Theologies of Space in the Scientific Revolution: Henry More, Joseph Raphson, Isaac Newton and their Predecessors', *Annals of Science*, 37 (1980), 489 - 548.

⁸⁸ The importance of the attribute of 'immensity' in the natural philosophy of the latter half of the

Clarke began the 1704 series by stating that it was undeniable that something has existed from eternity.⁸⁹ Things exist either through a necessity of their own nature or the will of another being. This is accepted even by the atheist as otherwise he would contradict the *ex nihilo* argument - a maxim which has been accepted by everyone, atheists included. Yet it is impossible for our weak understanding to attain 'any adequate or complete Ideas of the *manner*' in which an eternal existent persists.⁹⁰ Accepting that our understanding could not conceive of an 'eternal duration', Clarke maintained that the *fact* of eternal duration was generally acceptable to all and that the problem lay with our having limited ideas on the *manner* of its being.

All the Objections therefore raised against the Eternity of any thing, grounded meerly [sic] on our want of having an adequate Idea of Eternity; ought to be looked upon as of no real Solidity. Thus in other the like Instances; it is *demonstrable*, for example, that *Something must be actually Infinite*: All the Metaphysical Difficulties therefore, arise usually from applying the Measures and Relations of Things Finite, to what is Infinite; and from supposing *Finities* to be [Aliquot] *Parts of Infinite*, when indeed they are not properly so, but only as Mathematical Points to Quantity, which have no Proportion at all: (and from imagining all *Infinities* to be *equal*, when in things *disparate* they manifestly are *not* so.⁹¹

Having established the 'bare' fact of the eternity and infinity of 'something', Clarke's second proposition argued that what has existed from eternity was '*one Unchangeable and Independent Being*'.⁹² Clarke set up the argument as a disjunctive: either there has always existed a single eternal being, or there has been an 'infinite succession of changeable and *dependent* Beings' each following one from the other, 'in an endless Progression, *without* any Original Cause at all'. The latter of the disjuncts he considered absurd - 'plainly impossible, and *contradictory* to itself'. Yet all atheism, he says, must 'in its account of most things (as shall be shown hereafter)

seventeenth century is highlighted in Amos Funkenstein's, *Theology and the Scientific Imagination: From the Middle Ages to the Seventeenth Century* (Princeton, 1986). Funkenstein's notion of the 'Body of God' captures the range of themes involved in the process of applying physicality to God's ubiquity.

⁸⁹ Letsome and Nicholl, *op. cit.*, ii, p. 6.

⁹⁰ Letsome and Nicholl, *op. cit.*, ii, p. 6. Clarke is saying that our reason knows it to be indubitably true but it cannot find reasons for it being so - this 'recognition' of truth is similar to Descartes' notion of 'intuition'.

⁹¹ *Ibid.*, p. 7.

⁹² Clarke qualifies this in a note (note *c*) and says his meaning is only that '*One at least*'. To show that there can be one (and only one) was dealt with in his seventh proposition.

terminate in it'. The series cannot have an external cause, neither has it a 'Reason *within itself*' of existence. Because, it is assumed, there is no one being which is 'self-existent or *necessary*'. But, necessity of existence, Clarke continued, was that which could be the only 'Ground or Reason of Existence of anything, that can be imagined *within* the thing *it self*'. Thus, if no single being is necessary, then neither is the whole;

[A]bsolute Necessity of Existence, not being an *extrinsic, relative, and accidental* Denomination; but an *inward and essential* Property of the Nature of the Thing which so exists.⁹³

Therefore, an infinite succession of merely dependent beings, without an original independent cause is a series of beings which has neither 'Necessity, nor Cause, nor any Reason or Ground *at all* of it's Existence, either *within itself* or *from without*'. Thus having no cause, it is caused by nothing - Clarke has therefore demonstrated the contradiction. The assumption of the one disjunct as true and then shown to lead to a contradiction makes the other disjunct true by a *reductio ad absurdum*, and Clarke was entitled (logically) to affirm its negation. Therefore, if it is false that there have been many things necessarily existing from eternity, then it follows there is one Immutable and Independent being from all eternity.⁹⁴ Whatever this being was, whether it was material or immaterial - and this was the crux of the argument - it *was* from an inherent necessity. Clarke's primary metaphysical aim was now to demonstrate that this 'necessity' belonged only to the immaterial.

In Clarke's third proposition we are introduced to the important concept of 'necessity' which was to play such a prominent role in Clarke's metaphysical work.⁹⁵ It is in this proposition that Clarke confronted the atheist's claim that matter was a necessary self-existent being. For Clarke the Cartesian identification of matter with extension led to this 'absurdity'. To be self-existent is to exist, not by producing

⁹³ Letsome and Nicholl. *op. cit.*, ii. p. 7.

⁹⁴ *Ibid.*, p. 8. To suppose an infinite succession of changeable and dependent beings and not determine a necessary first cause is, Clarke says, 'a driving back from one Step to another, and (as it were) removing out of sight, the Question concerning the Ground or Reason of the Existence of Things'. What then, Clarke asks, caused the things we have? Not necessity, not chance (which is a mere term without significance) and no other being whatsoever, which conclusion leads to another *reductio*. This reiteration of the argument from a first cause was strengthened, Clarke argued, through our intuition of the concept of 'necessity'.

⁹⁵ The third proposition reads, '*That unchangeable and independent Being, which has existed from Eternity, without any external Cause of it's Existence; must be self-existent, that is, necessarily existing*'.

itself (contradiction) but to '*exist by an absolute Necessity originally in the Nature of the Thing itself*'. This necessity, Clarke maintained, was an antecedent requirement, not in time, but in the 'natural Order of our Ideas, to our *Supposition* of it's Being'. Clarke says this means that the antecedent must 'force itself upon us, whether we will or no, even when we are endeavouring to suppose that no such Being exists'.⁹⁶ This he demonstrated by explaining that we always find in our minds 'some Ideas, as of *Infinity and Eternity*'. To remove these by supposing that there is no being to which they refer would again be a contradiction as their presence necessitates a 'substance' in which they inhere. Thus because these modes cannot be removed out of the universe the substance cannot likewise be removed and therefore is a necessary being.

For Modes and Attributes exist only by the Existence of the Substance to which they belong. Now he that can suppose Eternity and Immensity (and consequently the Substance by whose Existence these Modes or Attributes exist) removed out of the Universe; may if he please, as easily remove the Relation of Equality between twice two and four.⁹⁷

The 'common' perception treated space as a mere nothing and as we know from the later disputes with Leibniz, Clarke treated space as the mode of God's presence.⁹⁸ From the arguments in the Sermons this implied that space was the *substance* of the presence of God, that is, a *something* in which the attribute of God's presence inheres. This argument, *mutatis mutandis*, applied also to time - the something (substance) in which the mode of God's duration inheres. The notion that everything must have a substance in which to inhere was a Cartesian doctrine.⁹⁹ This substance was, for Clarke,

the first and simplest Idea we can possibly frame; an Idea *necessarily and essentially* included or presupposed, as a *sine qua non*, in every other Idea whatsoever ; an Idea, which (unless we forbear thinking at all) we cannot possibly extirpate or remove out of our Minds; of a *most simple Being, absolutely Eternal and Infinite. Original and independent*.¹⁰⁰

⁹⁶ Letsome and Nicholl, *op. cit.*, ii, p. 9. Clarke was very close to attributing an independent ontological status to the concept of necessity. Ferguson says, he 'writes of this antecedent necessity in such terms as to create the impression that it is itself an entity that precedes the existence of God'. See, *Philosophy of Dr. Samuel Clarke*, p. 24.

⁹⁷ *Ibid.*, p. 9. Compare Descartes' remarks on how attributes or qualities must 'belong' to some substance. See *Principles of Philosophy, op. cit.*, i, sect. 11, p. 196.

⁹⁸ H. G. Alexander. *The Leibniz-Clarke Correspondence: Together with Extracts from Newton's Principia and Opticks Edited with Introduction and Notes* (Manchester, 1956).

⁹⁹ Letsome and Nicholl, *op. cit.*, ii., p. 10

¹⁰⁰ *Ibid.*, , p. 10. Clarke had difficulty in separating his own position from the ontological argument

It was also a Cartesian position that the locus of this proof resided in the intuiting human mind, that is, it would be unnatural for us, due to the innate activity of the rules of right reason, to deny its presence. The crux of the argument rested on our inability to imagine an eternal and infinite 'nothing' given that we are by nature endowed with the essential ability to imagine the ideas of eternity and infinity.

However, even though the language of this argument was Cartesian, its target was the Cartesian concept of extension. The foundation of all materialist claims was reduced to Descartes' metaphysical and theological errors of having identified extension (immensity) with matter. This led to what Clarke called 'that most intolerable Absurdity of asserting Matter to be a Necessary Being'. If, as Clarke had shown, it was impossible to remove from the mind the idea of infinity (immensity or space), then the *Cartesian* notion of immensity (extension/matter) was necessary: because the Cartesians themselves agreed that the idea of 'Extension' could not be an idea of nothing and the idea implied a necessary object.¹⁰¹ Clarke, therefore, charged the Cartesians with applying an idea to an object to which it does not belong - infinite extension became, in the language of Hobbes, an idea without signification. Clarke's programme of undermining the status of extension continued the attack on the Cartesian concept of matter which Bentley had recognised as an important task in his own Boyle Sermons.¹⁰²

To summarise, Clarke demonstrated the necessary existence of a 'something' by showing the contradiction contained in the contrary supposition, and by the

which he rejected. Thus, from his third proposition he concluded that the 'only true Idea of a self-existent or necessarily-existing Being, is the Idea of a Being, the Supposition of whose not-existing is an express Contradiction'. To use the term 'self-existent' in any other sense, Clarke asserted, was a contradiction in terms and 'using it without any Signification at all'.

¹⁰¹ Clarke quoted Descartes' remarks 'I think it implies a Contradiction for the World to be finite', from *Epist. 69, primae partis*; and a lengthy passage from the Cartesian Regis' *Metaphysica* (*Par. 1, Cap. 3*) to show that the error of attributing unwarranted attributes to matter had in fact occurred, and that Cartesianism resulted in the deification of matter.

¹⁰² In the second corollary to this proposition Clarke again attacked the ontological argument. Our first 'Certainty of the Existence of God', did not stem from 'the Idea our Minds frame of him' - that is, in the definition of the word 'God'. Clarke argued against the ontological argument that it was applicable only to the '*nominal Idea or mere Definition* of a self-existing Being' and not to a real and particular being outside of our conceptions. That argument relied on a *petitio*: we must, in the ontological argument, have the idea of the '*Thing*', and we must see the impossibility of removing the idea from our minds, and consequently of supposing the non-existence of the thing; before we can be satisfied from the Idea, that the thing actually exists. Why was Clarke critical of the ontological argument? The answer lies, I suggest, in his efforts to lend solidity to his concept of a 'something' which ought to be 'much clearer and more convincing' because it is a something *outside* the mind.

impossibility of removing from the mind the ideas of eternity and immensity. As these are ideas in the mind they must be modes or attributes of something outside the mind. Clarke insisted that the existence of this something was not a mere idea: the attributes of immensity and eternity were modes and therefore required the existence of an extramental something in which they adhered. Furthermore, the fact that we can conceive the material world as not-existing means that it does not exist of a necessity in its own nature:

to suppose *more* or *fewer* Stars, *more* or *fewer* Plants, or to suppose their *Size*, *Figure*, or *Motion*, different from what it now is; or to suppose *more* or *fewer* Plants and Animals upon the Earth, or the present ones of different *Shape* and *Bigness* from what they now are. In all which things there is the greatest Arbitrariness, in respect of Power and Possibility, that can be imagined; however necessary any of them may be, in respect of Wisdom, and Preservation of the Beauty and Order of the Whole..¹⁰³

Besides the folly of attributing motion and form to mere chance, it could also be demonstrated from arguments drawn from the nature of matter itself that it was not a necessary being. Clarke's procedure in this case provides an example of one among many instances of the scholastic style of Clarke's argumentation. He formed a *quaestio*, that is he considered the question, 'Is bare Matter to be necessary? The argument was conducted by *utrumque partem*: the contrary claim was stated - in this case the assertion of the presence of a vacuum showing that matter was not necessary. Next he searched for evidence which would sway the argument one way or the other. Turning to *places* - the *topica* of mathematics and 'experiments' - for definitions of the term 'matter' he collected observations on the subjects behaviour. Mathematicians contributed the definition that '*Tangibility* or *Resistance* is essential to *Matter*' (Clarke notes that the cause of the resistance is another question). This resistance, he explained, the mathematicians called '*Vis inertiae*' as its determinate signification, and without which the term was empty. Thus, it belongs to all matter. He then argued for the contrary supposition: suppose 'All Space were filled with

¹⁰³ Letsome and Nicholl, *op. cit.*, ii, p. 12. If '*Motion*' was to be a necessary being, then it would be a contradiction to suppose any matter to be at rest, which, Clarke asserted, was absurd. Clarke was attacking Toland as a supporter of this view. Toland, argued that it is the '*Conatus to Motion*, the *Tendency* to move, the *Power* or *Force* that produces actual Motion' which is essential to matter. However, Clarke insisted that the tendency to motion must be in a determinate direction and this implies an external cause - there cannot be a tendency to motion in every direction at once which would be the case if it was only the tendency which was innate. This would make matter eternally at rest. As noted in chapter four above, Bentley had argued similarly in his attack on the Epicurean notion of an inclination (*clinamen*) in matter to swerve from its vertical fall in infinite space.

Matter', then the resistance of all fluids would be equal. This follows irrespective of the size of the particles. The contradiction of this contrary assumption, that matter does not fill all space, was asserted and was tested from the topic of 'experiment'. Experiment showed that the resistance of all fluids was not equal. Therefore matter could not fill all space. Consequently, if all matter is unequally tangible then there must be a vacuum, and *ergo* matter was not a necessary being.¹⁰⁴

Proposition four dealt with the 'Essence' of God, '*What the Substance or Essence of that Being, which is Self-existent, or Necessarily-existing, is; we have no Idea, neither is it at all possible for us to comprehend it*'.¹⁰⁵ Thus far, Clarke had demonstrated that it *is*, that is, we have a certainty of its existence even though we cannot say what its essence is.¹⁰⁶ The crucial distinction between these two propositions is that the former is capable of the 'strictest Demonstration' while the latter is 'beyond the Reach of all our Faculties to understand'. Clarke was here relying on what by that time had become a standard trope - the inability of our faculties to perceive into the essences of things, *a fortiori* into the essence of the Supreme Being:

A Blind or Deaf Man has infinitely more Reason to deny the Being, or the Possibility of the Being, of Light or Sounds; than the Atheist can have to deny, or doubt of, the existence of God. For the One can at the utmost have no other Proof, but credible Testimony, of the Existence of certain Things,

¹⁰⁴ *Ibid.*, p. 12. From the topic of experiment (falling bodies and pendulums) he also asserted the proposition. '*All Bodies whatsoever, in Spaces void of sensible Resistance, fall from the same Height with equal Velocities.*' The force acting on them, therefore, must be proportional to the quantity of matter: any inequality of gravity would soon be discovered by experiments with the pendulum, since the *vis inertiae* would offer more resistance. Thus gravity is in all bodies proportional to the quantity of matter - this likewise proves a vacuum.

¹⁰⁵ Letsome and Nicholl, *op. cit.*, ii, p. 18. The main 'Question', between the atheist and Clarke was not whether some being can possibly have existed from eternity but whether it was a divine intelligent mind. Almost all the ancient philosophers held to the eternity of the world and modern atheists simply used them as authorities. However, the ancients did not assert that the world was without a 'Supreme All-governing *Mind*' which Clarke identified with the notion of the Christian God. Therefore atheists could not draw on the authority of the ancients, since Clarke illustrated that Plato, Aristotle and their commentators had always argued for a Divine Mind.

¹⁰⁶ The impossibility of comprehending the 'Substance or essence of the self-existent Being', does not preclude demonstrating the 'Essential Attributes of his Nature'. These, Clarke maintained' were 'strictly demonstrable'. For example, the 'Self-Existent being' must of necessity be Infinite and Omnipresent. There must be something independently infinite otherwise an effect would precede a cause, which is impossible. The necessity must be everywhere and at all times. There cannot be any external cause which would imply that there was something outside itself.

whereof it is impossible that he himself should frame any manner of Idea, not only of their Essence, but even of their Effects or Properties.¹⁰⁷

The atheist, on the other hand, can have undeniable Demonstration of its being, and may know the attributes even though the essence is forever hidden just as it is in things we are most in contact with.

We are utterly ignorant of the *Substance* or Essence, of *all other* Things; even of those things which we converse most familiarly with, and think we understand best. There is not so mean and contemptible a Plant or Animal, that does not confound the most enlarged Understanding upon Earth: Nay, even the simplest and plainest of all inanimate Beings, have their Essence or *Substance* hidden from us in the deepest and most impenetrable Obscurity. How weak then and foolish is it, to raise Objections against the Being of God, from the Incomprehensibility of his Essence! and to represent it as a strange and incredible thing, that there should exist any incorporeal substance, the Essence of which we are not able to comprehend! As if it were not far more strange, that there should exist numberless Objects of our Senses, things subject to our daily Enquiry, Search, and Examination; and yet we not able, no not in any Measure, to find out the *real Essence* of any one even of the least of *these* Things.¹⁰⁸

In the corollaries to the fourth proposition Clarke again exhibited his ambiguous relationship to scholastic terminology. Within discussions of the essence of God, Clarke claimed, 'appears the Vanity of the Schoolmen', who in order not to appear ignorant invent 'Terms of Art, and Words of Amusement, mere empty Sounds' having no signification, as when they define the essence of God as '*Purus Actus, mera forma*'. Clarke, however, is not objecting to the terms themselves but only to their mis-application to the essential nature of God - it was legitimate to apply them to the 'Perfection of his *Power*, and other Attributes'. In propositions five and six he continued his debate with the scholastics when he demonstrated that 'eternity' was an essential attribute of God and that God's 'infinity' must signify '*Fullness*' and '*Immensity*'. It must be 'equally present everywhere'.¹⁰⁹ In his account of the scholastic explanation of God's eternal duration and knowledge, he was forced to accept a version of the scholastic *nunc stans* argument: God perceives '*as if* there was really no Succession at all, but all Things were actually present at once'. He defined God's eternal duration to be

¹⁰⁷ Letsome and Nicholl, *op. cit.*, ii, p. 18.

¹⁰⁸ *Ibid.*, pp. 18 - 19.

¹⁰⁹ *Ibid.*, p. 21.

in the most proper and intelligible Sense of the Words, to all the Purposes of Excellency and Perfection, *Interminabilis vitae tota simul & perfecta Possessio: the Entire and Perfect Possession of an endless Life.*¹¹⁰

The problem with the Scholastic definition of God's Omnipresence and Eternity was, Clarke maintained, an opportunity afforded to the atheist to scoff at their absurd language: the scholastics spoke of God's immensity as a 'point' and his eternity as an 'instant'. Clarke provided an alternative definition, which on the surface does not appear to be less 'absurd' than the scholastic account:

[t]hat whereas all Finite and Created Beings, can be present but in One definite Place at Once; and Corporeal Beings even in That One Place very imperfectly and unqually, to any Purpose of Power or Activity, only by the Successive Motion of different Members and Organs: The Supreme Cause on the contrary, being an Infinite and most Simple Essence, and comprehending all Things perfectly in himself, is *at all Times equally* present, both in his Simple Essence, and by the Immediate and Perfect Exercise of all his Attributes, to every Point of the boundless Immensity, *as if* it were really all but one single Point..¹¹¹

Thus, Clarke focused on God's presence in terms of the 'power' to operate at every point *as if* it was a single point: the *nunc stans* of the scholastics simply became the equal operation of God's activity throughout the immensity of space, that is, God was immediately present to all his operations in the corporeal world.¹¹² Although Clarke does not, at this time, consider the implications of what he is saying, Leibniz would soon draw them out and accuse Clarke of making the Supreme Being the equivalent of a material, albeit infinite, space - a created and therefore non-necessary

¹¹⁰ *Ibid.*, p. 20. On this topic, Clarke utilised Gassendi's and Tillotson's disagreement with the Schoolmen to support his metaphysics. See, *ibid.*, note *m*, p. 20. If McGuire is correct in his interpretation of a Newton manuscript (which McGuire refers to as 'Tempus et Locus') dealing with this issue, then we see a disagreement between Newton and Clarke over the metaphysical acceptance of the notion of *tota simul* - Newton rejected this as an account of God's eternal duration. See, J. E. McGuire, 'Predicates of Pure Existence: Newton on God's Space and Time', in Philip Bricken and R. I. G. Hughes, eds., *Philosophical Perspectives on Newtonian Science* (Cambridge, Mass./London, 1990), pp. 91 - 108. There is also an excellent discussion in the same volume by John Carrero, see 'Newton on Space and Time: Comments on J. E. McGuire', pp. 109 - 33. Carrero also concentrates on Clarke's contribution to the issues.

¹¹¹ *Ibid.*, p. 21. I would like to draw attention to the phrase 'as if' which would later cause so much trouble in the dispute with Leibniz. See, Alexander Koyré and I. B. Cohen, 'The Case of the missing Tanquam: Leibniz, Newton and Clarke', *Isis*, 52 (1961), 555 - 66.

¹¹² The concept of 'immediately present' probably derived from Descartes' notion of the immediacy of ideas to the mind. Space appeared to offer a solution to the problem of how God might act on his material creation. It was easier for the imagination to conceive of one extended thing acting on another extended thing. For a brief discussion of the notion of 'immediately present', see John W. Yolton, 'On Being present to the Mind: A Sketch for the History of an Idea', *Dialogue*, 14 (1975), 373 - 88.

being. Clarke was faced with a problem, analogous to that for which Descartes took so much criticism - how could an immaterial substance be 'immediately present' to the activities and operations of matter? The materialising of the substance of the deity by an appeal to the imagination's ability to perceive space as a container seems to have been an objective of both Clarke's and Newton's - the search for graspable - almost palpable - images of God's power over, and *in*, the creation. God must be *present* to operate, and for the worshipper to address his devotion to a Lord who is truly lord by the capacity to immediately effect his fiat. Although (as Clarke might say) we cannot comprehend the manner of God's immediate presence in his operative capacity we have little trouble in transferring the operation of his power *as if* he operated in the mode of Lordship.¹¹³ Theologically this has scriptural sanction, since God's 'Word' and fiat are identical - His saying and doing are commensurate. Moreover, rhetorically it was incumbent on Clarke, confronting those who considered theological discourse to be unintelligible jargon, to materialise easily graspable images.

The above discussion provides examples of Clarke's metaphysical language and of his method of argumentation. Although the second series, delivered in 1705, continued the same overall strategy - to wrest the remaining authoritative sites from his opponents' hands - its method and its language were very different. In these Sermons he drew support from areas which the deists were keen to appropriate as testimony for the historical veracity of natural religion - the classical authors, particularly Plato and Cicero.¹¹⁴ These authorities represented a *sensus communis* for the presence of natural notions of virtue and order. By the time he introduced divine Revelation he had already demonstrated, by reference to the self-confessed failures of the ancients, that the presence of these natural notions had failed to effect a reformation in human nature.

¹¹³ Loup Verlet, provides a detailed discussion on the relationship between Newton's concept of an operative God of Dominion - by contrast with a metaphysical abstract power - and the mathematical laws imposed by a God of Dominion. Verlet's argument rests on his claim that the Calvinist notion of the Fall implied that the mathematical laws of the universe were unaffected even though the faculties of man were impaired. See, 'F = MA' and the Newtonian Revolution: An Exit from Religion through Religion', HS, 34 (1996), 303 - 46.

¹¹⁴ On Clarke's debt to Cicero, see James Edward Le Rossignol, *The Ethical Philosophy of Samuel Clarke* (Leipzig, 1892). On the importance of Cicero in this period, see G. A. Burnett, 'The Reputation of Cicero among the English Deists, 1696 - 1776', PhD thesis (University of Southern California, 1947).

The shared vocabulary of morality and virtue, common to Clarke and his antagonists, adds to the difficulty of determining precise substantive differences. Terms such as 'reasonableness', 'reason', 'light of nature', 'light of reason', and 'rules of right reason', are applied indiscriminately by Clarke to God, Nature, 'the Order of things', and the human mind. For instance, 'virtue' can be 'an unaccountable and as it were a divine force', an 'image' implanted by God in human nature, so that by an inertial force the will, or understanding, continues to operate within the bounds of eternal rightness even though put out of its path by sin and corruption. Clarke described 'Eternal reason' as an 'original Obligation' whose force operates in human nature itself: custom, law and institutions being 'secondary Obligations'. At times, Clarke argued that even God constrains his actions to this 'Eternal Reason and Unalterable Relationship' of the fitness of things., Although God is not under a necessity of 'Fate', He is under a moral necessity. He can arbitrarily alter the natural world; He could have placed, for example, the comets in any transverse motion through the universe; He could have altered the distances and relative sizes of the planets; but he cannot act against His own unalterable moral decrees.¹¹⁵

This shared communal vocabulary lay at the heart of the threat from Deism. In 1705 an edition of Lord Herbert of Cherbury's, *The Antient Religion of the Gentiles, and Causes of their Errors Considered* was published. In this, as in the works of Toland and other deists, a significant use was made of the notion of the 'Law of Nature'.¹¹⁶ The Law of Nature was defined by Tindal 'absolutely perfect, Eternal and unchangeable'. A striking similarity exists between the terms of this definition and the traditional attributes of the Christian deity. The extensive deployment of the arguments of Plato and Cicero, in Clarke's second series of Boyle Lectures, can be explained as a reaction to the deistic use of natural law. . In

¹¹⁵ For these reasons it becomes almost a pointless exercise to attempt a classification of Clarke's deity into 'voluntarist' or 'rationalist' - the issue is a non-starter. For an excellent account of the historical origins of this distinction see, William J. Courtney, *Capacity and Volition: A History of the Distinction of Absolute and Ordained Power* (Bergamo, 1990). Clarke combined the notions of plenitude, sufficiency, reason, contingency and power, and emphasised one or more as the occasion demanded.

¹¹⁶ See, Robert E Sullivan, *John Toland and the Deist controversy: A Study in Adaptations* (Cambridge, Mass./London, 1982), esp. pp. 64 ff., on the problems posed for Anglican theology by the historical presence of 'virtuous pagans', and the concept of natural law.

Cicero's *De natura deorum* Clarke found all the materials required for arguing for the presence of natural notions of a deity, and for undermining Stoic and Epicurean philosophies.¹¹⁷ Clarke equated the Stoics with 'our modern deists', and the modern materialist-atheist with the Epicureans. Cicero also argued against the Epicureans that the foundations of religion were not due solely to custom and legal authority. Thus, whereas the deist claimed religion to be an invention, Clarke inverted the argument and argued that custom and authority - what he referred to as 'secondary Obligations' - accounted for the continuance of man's fallen state: Mankind had fallen from an initial compliance with the rules of 'right Reason' which originally reflected (in the sense of 'image') the unalterable will of God. This original truth became even more obscured by family, education and social mores, and our current erroneous inclinations were compounded by the love of pleasure. These forces, Clarke maintained, made a 'great opposition to the Motions of Reason'. The multitude of gross opinions and superstitions increased the individual's ignorance, carelessness and stupidity. What had been easy to discover in the beginning was subsequently clouded over by a mad exercise of the passions, eventually obscuring the light of nature - until Cicero's 'sparks' of divinity were almost extinguished. In this state of darkness very few were capable of distinguishing virtue from vice. Consequently there was a great need of 'particular Teaching' and 'much instruction' supported by the weight of authority, reason and persuasion. Clarke compared this nexus of pedagogic requirements with Socrates' role as the instructor who 'reminds' us of that which we already know. In the Platonic dialogues remembrance was generated by the probing of Socrates. In the Sermons, Clarke's self-proclaimed function was to 'distinctly propose' truths, in solid language and by means of easily graspable images, in order to 'inculcate', that is, to cause a deep and lasting impression on the minds of his audience. The mind was compelled to assent on the basis of moral evidence.

Clarke used the ancient authors in two ways: firstly, to support by the best of the human authorities, acceptable to all, the existence of natural religion, and secondly to illustrate, by means of copious quotations, that these authors had acknowledged the *insufficiency* of natural religion. The wisest of the ancients - Job,

¹¹⁷ H. Rackham, *De Natura Deorum, with an English Translation* (London, 1933).

Socrates, Cicero and Epictetus - were all forthright in their recognition of the need for a revelation from that being whose existence they had naturally intuited. Thus, the 'wisest and most sensible of Philosophers' confessed

that Human Nature was strangely *corrupted*; and they acknowledged this *Corruption* to be a Disease whereof they knew not the true *Cause*, and could not find the Remedy. So that the great Duties of Religion were laid down by them as Matters of *Speculation and Dispute*, rather than as the *Rules of Action*; and not so much *urged upon the Hearts and Lives of Men*, as *proposed to the Admiration* of those, who thought them hardly possible to be effectually practised by the generality of Men. To remedy all these Disorders, and conquer all these Corruptions, there was plainly wanting some extraordinary and supernatural *Assistance*; which was above the reach of bare Reason and Philosophy to procure.¹¹⁸

Moreover, the ancients lacked the presence of someone capable of presenting in an ordered whole the complete system of salvation: the ancients were in possession only of isolated and sparse discoveries. Whereas the Deists had claimed, *because* the ancients discovered universal notions of virtue and order, *therefore* a revelation was unnecessary. Clarke inverted the deist argument and demonstrated that whilst it was true that there was the common apprehension of such notions, the admittance of a universal expectation of a revelation demonstrated the failure of these notions alone. Therefore, the obvious similarities between Pagan and Christian terms and observances did not undermine the specific nature of the Christian dispensation: the deist, Clarke announced, had unsuccessfully attempted, in the words of Isaiah to 'make the bitter sweet and the sweet bitter'.¹¹⁹

Clarke's rhetorical strategies in this second series continued the appropriation of 'evidence', 'authority' and 'probable proofs', that we have already seen in the Sermons of Bentley and Harris. In true courtroom fashion he displayed his evidence: the collection of the passages from the ancients he labelled an 'induction of particulars'; he had, he claimed, delivered a 'plain and regular system; his evidence constituted 'Signs and Matters of Facts' which transmuted what were formerly only 'highly probable' but were now supported by a positive and direct revelation. His language of 'seeing' the thing proved, illustrates his reliance on the visual ambiguity in the term 'Revelation'. The Scriptures have a 'visual' force, since they 'set before' the reader's 'Eyes' a 'lovely Image and Representation of True Virtue', analogous to

¹¹⁸ Letsome and Nicholl. *op. cit.*, ii, p. 133.

¹¹⁹ The reference is to *Isaiah*, 5: 20.

the manner by which nature displays order and fitness.

In the preceding discussion I have offered examples to show that the thrust of Clarke's Boyle Lectures did not derive from a Newtonian impetus. His first series was principally metaphysical and scholastic. The second series had no use for Newtonian philosophy, since the arguments were drawn from human and divine testimony. In many of these examples, and in other passages, Clarke was not drawing on Newton's writings but on commonplace topics and standard authorities both ancient and modern. In the next section I will treat Clarke's use of Newton's work in a more precise manner, to show how the principles of the latter functioned only in highly precise argumentative contexts.

6. 5. Newton as a Resource for Clarke's 1704 Sermons.

Clarke drew on Newton's writings in his notes to Rohault, his letters supporting Newton's position against Leibniz, and in his 1728 letter to Hoadley attacking the notion of 'vis viva'.¹²⁰ However, in the light of the preceding analysis of the Sermons there is no compelling reason to evaluate the Boyle Lectures within this framework. Even those enterprises of Clarke's which support his role as Newtonian apologist do not function in a straightforward fashion. The various English editions of the translation of Rohault's work have already been shown to demonstrate only a *gradual* encompassing of Newton's natural philosophy. Likewise the dispute with Leibniz took place in a series of letters and was not a systematic treatise on natural philosophy or metaphysics, but bears all the trademarks of scholarly disputation and agonistic posturing - a feature endemic to the period. As argued above Clarke's and Bentley's Sermons were not examples of a common genre exhibiting a unified programme. Of course, these comments on the complexity of the Newton-Clarke relationship do not remove the need to investigate specific Newtonian materials in Clarke's Sermons. In the remainder of this chapter I will attempt a precise examination of the *use* to which Clarke put Newton's *Principia* and

¹²⁰ *A Letter from the Reverend Dr. Samuel Clarke to Mr. Benjamin Hoadley, F. R. S. Occasion'd by the present Controversy among Mathematicians, concerning the Proportion of Velocity and Force in Bodies in Motion* (1728), in *Works*, iv, pp. 737 - 40. Clarke's main aims in his contribution to the 'vis viva' controversy were to confute the claims that matter possessed a living force, and to argue that there was no possibility of perpetual motion. The letter was initially printed in *Philosophical Transactions*. On the controversy, see Caroline Iltis, 'Leibniz and the Vis Viva Controversy', *Isis*, 62 (1970), 21 - 35.

Optice.

The first citation of Newton occurred in Clarke's discussion of the impossibility of supposing '*Immensity* removed out of the Universe': a whole cannot be removed from itself as itself would remain, which Clarke says is a '*Contradiction in Terms*', and is the same as supposing a part of space removed out of itself.¹²¹ Clarke was in the process of arguing that it was impossible for us to remove the idea of immensity from our minds and, therefore, there must be a real substance in which this mode inheres - this real thing being 'space'. The language of the argument was a mixture of Cartesian and scholastic terminology: the argument was '*intuitively evident*' to anyone who 'attends to his own Ideas', and space could not be 'nothing' since

Nothing, is that which has *no Properties or Modes whatsoever*. That is to say; it is that *of which nothing can truly be affirmed*, and *of which everything can truly be denied*. Which is not the Case of *Immensity* or *Space*.¹²²

Newton appeared as one of many authors cited and the same use of Newton occurred again when Clarke discussed the proposition that God was unchangeable, simple, and without '*Parts, Figure, Motion, Divisibility*, or any other such Properties as we find in Matter'.¹²³

The third mention of Newton's *Principia* is found in Clarke's attack on the view that matter necessarily existed. Clarke gave the 'Mathematicians' definition of the essential properties of matter as '*Tangibility . . . or, Resistance*'. From this definition he argued for the existence of a vacuum and concluded that matter was not necessary. He offered a second argument from experiments on falling bodies and pendulums, concluding, that

Gravity therefore is in all Bodies proportional to the *Quantity* of their *Matter*. And consequently all bodies not being equally heavy, it follows again necessarily, that there must be a *Vacuum*.¹²⁴

Clarke's tactic was to reduce the ontological significance of matter, and to that end

¹²¹ He quoted from the first edition of the *Principia*, Bk. 1, Scholium, definition 3.

¹²² Letsome and Nicholl, *op. cit.*, ii, p. 9. Hoadley says that Clarke, when he was very young, had considered the impossibility of destroying space and concluded that it was an impossibility even for God.

¹²³ *Ibid.*, p. 21.

¹²⁴ *Ibid.*, p. 13.

he used the authority of experimental philosophy - against those (Toland and Spinoza in this case) who sought its assistance - to support what he had already demonstrated as a necessary truth. In this case Newton functioned as a key source in attacking the Cartesian account of matter. This is a highly specific use of Newton and its specificity is rarely if ever noted by Jacob and those who argue that Clarke's project was Newtonian. Here Newton's natural philosophy was deployed to support a metaphysical point and not to sanction a political or social system. Thus it is important to be aware of the context-specific use of materials within the highly particular argumentative strategies in Clarke's performance.

The remaining citations of Newton occurred in the context of Clarke's *a posteriori* arguments. In opposition to Spinoza's claim that there was a necessary order and absolute necessity of nature in the universe, Clarke referred to Newton's discussion of comets in the *Optice* to show that those heavenly bodies might have moved in any possible transverse motion. The *Optice* was also used to support the fitness of parts in the different species of animals against the Lucretian view that many monsters have come and gone in a process of trial and error. The final citation of Newton occurred in Clarke's eleventh proposition, which demonstrated that God '*must of necessity be infinitely Wise*'.¹²⁵ From his preceding propositions Clarke deduced that a being possessing infinite power must know all the '*Possibilities of Things to come*', and, therefore, must know the wisest course for the benefit of the whole. Thus, every effect of the supreme cause must be the product of infinite wisdom.

More particularly: The Supreme Being, because he is *Infinite*, must be everywhere present: And because he is an *Infinite Mind or Intelligence*, therefore wherever he Is, his knowledge Is, which is inseparable from his Being, and must therefore be infinite likewise: And wherever his *Infinite Knowledge* is, it must necessarily have a *full and perfect Prospect* of all Things, and nothing can be concealed from its Inspection: He includes and surrounds every thing with his boundless Presence; and penetrates every part of their Substance with his All-seeing Eye: So that the inmost Nature and Essence of all things, are perfectly naked and open to his View; and even the deepest Thoughts of Intelligent Beings themselves, manifest in his sight.¹²⁶

As God is alone self-existent all the powers and properties of other beings come from

¹²⁵*Ibid.*, p. 47.

¹²⁶ *Ibid.*, p. 48. Compare Newton's language in the General Scholium: God is 'all eye, all ear, all brain, all arm, all power to perceive, to understand, and to act'. *Principia* Bk. ii, General Scholium, p. 545.

him. Thus, Clarke concluded,

the Supreme Cause is moreover All-Powerful; so that He can no more be prevented by Force or Opposition, than he can be hindered by Error or Mistake, from *Effecting*, always what is absolutely Fittest [sic] and Wisest to be done: it follows undeniably, that he is *actually and effectually*, in the highest and most complete sense. *Ininitely Wise*; and that the World, and all the Things therein, must be and are the Effects of Infinite Wisdom. This is Demonstration *à priori*.¹²⁷

The argument and proofs *à posteriori*, Clarke asserted, were no less ‘strong and undeniable’. However, because it had been treated at length elsewhere by others, he explained he would ‘not inlarge [sic] upon this Argument’.¹²⁸ Moreover, he maintained, given the production of more ‘accurate Observations’ and ‘greater Discoveries’ by modern natural philosophers, the ‘stronger this Argument continually grows’. He described how even in the ‘Infancy of Natural Philosophy’ the opinions of the Epicureans were condemned. Thus when the systems of the ancients have been superseded by the discoveries of the moderns the atheist ought to feel shame for relying on such outmoded opinions. The ‘*Modern Discoveries in Astronomy*’, have subsequently only enhanced the awe and admiration which Cicero had expressed in his observations on the order of the heavenly bodies and their obvious divine disposition. This panegyric to contemporary natural philosophy was the context for a further reference to Newton’s determination of the

exact Accomodating of the Densities of the Planets, to their Distances from the Sun, and consequently to the Proportion of Heat which each of them is to bear respectively.¹²⁹

Since atheism could not withstand the arguments of Cicero, ‘that great master of Reason’, Clarke concluded that atheism

which *Then* was altogether unable to withstand the Arguments drawn from This Topick: must *now*, upon the additional Strength of these later Observations, (which are every one an unanswerable Proof of the incomprehensible Wisdom of the Creator) be utterly ashamed to show its Head.¹³⁰

¹²⁷ *Ibid.*, p. 48.

¹²⁸ *Ibid.*, p. 48 - see note *e* where Clarke cited Galen, Tully (Cicero), Boyle, Ray, Derham.

¹²⁹ *Ibid.*, p. 49. He also listed the discoveries of the moons about their planets by means of telescopes, the discovery of the adjustment of our own Moon’s motions about the Earth once a month; the motions of comets; the adjustments necessary in the whole system because of the ‘Effect of the smallest possible Resistance made by the finest Aether, and even by the Rays of light themselves’ to their motions.

¹³⁰ *Ibid.*, p. 49. Clarke closed this section on the incomprehensible wisdom of God with a quotation

I have quoted Clarke at length in order to locate precisely the manner in which he deployed science. Natural philosophy was a 'Topick' - a place - from which proofs might be drawn in order to support the *a posteriori* argument for the wisdom and providence of God. The comparison between the ancients and the moderns - between Galen and Harvey and between Cicero and modern astronomy - relied on the trope of improvement, and the conflation of modern with ancient atheism. Thus, modern natural philosophy, including Newton's, was appropriated to demonstrate that the traditional argument *a posteriori* was improved by every observation and discovery since the days of Galen and Cicero. By contrast the argument *a priori* was not subject to improvement since it was universally true at all times. As we have seen in our discussion of Clarke's second series, the ancients intuited the being of a God even though a special revelation was necessary for instructing us in our duty towards that being. Clarke's emphatic use of observation and experiment also highlights the rhetorical force of the visual element which the *a posteriori* way could harness. This kind of argumentation relied on its visual appeal: experimentation and observation enhanced its power, particularly with the application of optical instruments.

This latter point also provides a context for Clarke's remarks on the superiority of the *a posteriori* - in spite of the fact that his 1704 series was built mainly on *a priori* demonstration. *A Posteriori* arguments were deployed to their fullest effect in proposition eight, '*The Self-existent and Original Cause of all Things, must be an Intelligent Being*', which announced what he described as 'the crux' of the debate between the atheist and the Christian. The importance of this can be assessed from Clarke's highlighting it:

In this proposition lies the main Question between us and the Atheist. For, that something must be Self-existent; and that That which is Self-existent, must necessarily be Eternal and Infinite, and the Original Cause of all Things; and will not bear much Dispute But all Atheists, whether they hold the world to be of *itself* Eternal, both as to the Matter and Form, or whatever they hold the Matter only to be Necessary and the Form Contingent, or whatever Hypothesis they Frame; have always asserted and must maintain, either directly or in directly, that the Self-existent Being is not an *Intelligent*

from the sceptical *Ecclesiastes*, 43: 32, which speaks of the limited knowledge that we may have of the nature of God's works. Locke used a similar passage from *Ecclesiastes*, 40: 5 as an epigraph to the 4th edition of his *Essay* (1700).

Being, but either pure unactive *Matter*, or (which in other Words is the very same thing) a mere *necessary Agent*.¹³¹

This consideration does not appear to us *a priori*, Clarke says, because imperfect human understandings cannot have empirical access to divine intelligence. However, Clarke maintained *a posteriori* that the world demonstrated and offered ‘undeniable Arguments’ for the effects of such an Intelligence. It is important to note how natural philosophy was utilised only in *a posteriori* arguments and to emphasise that Clarke was fully aware that he was drawing on a well established proof:

This Argument has been so Learnedly and Fully handled both by Ancient and Modern Writers; that I do but just mention it, without enlarging [sic] at all upon it. I shall only at this Time make this One Observation.¹³²

From the varying kinds of Powers and Excellencies in things we are led to consider a primary power which must be greater than its effects:

the Self-existent Being, whatever that be supposed to be, must of necessity (being the Original of all Things) contain in itself the Sum and highest Degree of all the Perfections of all Things’. Thus intelligence, for example, cannot arise from unintelligence.¹³³

This was a crucial weapon in the attack on Descartes’ ontology of matter and motion which had been utilised in materialist accounts of the soul. Clarke insisted that Descartes had given an ‘impossible and ridiculous Account’ of how the world might have been formed by the ‘Necessary Laws of Motion alone’.¹³⁴ However, even if Descartes’ account were true, this was only applicable to the *inanimate* part of the world, which Clarke described as, ‘infinitely, the least considerable part’. It was in this context that Clarke produced the ubiquitous refutation of the spontaneous generation of animals from dirt, citing Boyle, Ray, and Derham to counter the Epicurean hypothesis of spontaneous generation:

From which most excellent Discovery, we may, by the way, observe the Usefulness of natural and Experimental Philosophy, sometimes even in Matters of Religion.¹³⁵

¹³¹ Letsome and Nicholl *op. cit.*, vol. ii, p. 25. Bentley had also considered this to be the main point of contention.

¹³² *Ibid.*, p. 26. Clarke considered four such arguments drawn from traditional commonplaces.

¹³³ *Ibid.*, p. 24. There were only three possibilities as to how we came by intelligence: we possessed it from eternity; from that which did not have intelligence; or from an intelligent agent. If the first two were shown to be false, then the third must be true. Clarke was required to prove that intelligence is a distinct quality and not a mere effect or composition of figure and motion.

¹³⁴ Letsome and Nicholl, *op. cit.*, ii, p. 27.

¹³⁵ *Ibid.*, p. 27. Clarke’s comments also highlight the role of natural philosophy - it was still seen

This notion of usefulness explains the presence of Newton and other natural philosophers in Clarke's Sermons, but the use was invariably context-specific. For example, in dealing with the liberty of God, against the arguments of Spinoza, Clarke utilised the notion of 'contingency' in the order of things. The difference between Clarke and Spinoza rested on the interpretation of the 'Necessity of the Divine Nature'. Clarke claimed that Spinoza intended this phrase to mean a 'natural' necessity, whereas, for Clarke, it meant a necessity in the 'Perfection and Rectitude of his Will'. God was 'unalterably determined to do always what is best in the whole'. The fact that God by his free choice could have arranged the world differently, so that the order and beauty would then have been different, demonstrates that the present system is not a necessary one. The element of contingency therefore allowed Clarke to assert that any of it might be changed without a contradiction.

Motion it self, and all its Quantities and Directions, with the Laws of *Gravitation*, are intirely [sic] Arbitrary; the *Number* and *Motion* of the *Heavenly Bodies*, have no manner of Necessity in the Nature of the things themselves. The *Number* of the Planets might have been greater or less. Their *Motion* upon their own Axes, might have been in any proportion swifter or slower than it is now. And the *Direction* of all their progressive Motions, both of the primary and secondary Planets, uniformly from West to East. (when by the Motion of *Comets* it appears there was no Necessity but that they might as easily have moved in all imaginable transverse Directions:) is an evident proof that these things are solely the Effect of Wisdom and Choice. There is not the least appearance of Necessity, but that all these things *might* possibly have been infinitely varied from their present Constitution: And (as the late improvements in Astronomy discover) they *are* actually liable to very great Changes.¹³⁶

Thus the discoveries of Newton were used in this case not to demonstrate an inherently necessary order which could be reflected in the social order but to illustrate the utter contingency of things. However this contingency did not signify a confusion but indicated the manner in which the necessity and fitness of each thing conformed to the advantage of the whole - this was no more than the argument from a final cause. The works of Galen, Cicero, Boyle and Ray simply provided authoritative approval - acceptable to all - in his defence of final causes.

Whoever pleases, may, for Satisfaction on this Head, consult *Galen de Usu Partum*, *Tully de Natura Deorum*, *Mr Boyle of Final Causes*, and *Mr Ray of the Wisdom of God in the Creation*. I shall observe this One thing; that the larger the Improvements and Discoveries are, which are daily made in

as *ancilla* (handmaiden) to theology.

¹³⁶ *Ibid.*, p. 30.

Astronomy and Natural Philosophy; the more clearly is this Question continually determined, to the shame and Confusion of Atheists.¹³⁷

I have not sought in this chapter to downplay the role of Newton in Clarke's career in general, but only to show that Newton did not fulfil the central function attributed to him by Jacob and others in the Boyle Sermons. It was, therefore, essential to examine in detail the tactics of the Sermons and show the use Clarke made of Newton's natural philosophy within these overall structures. A balanced analysis would portray the Sermons as principally aimed at Descartes, Hobbes and Spinoza, while using some of the methods of these authors. This reading marginalises Newton, whose writings are deployed in a few very specific places. Yet these citations of Newton do nothing to support the socio-political interpretation of the Jacob thesis.

¹³⁷ *Ibid.*, p. 31. Spinoza, according to Clarke, declared final causes to be 'the Fictions of ignorant and superstitious Men' who were 'so foolish and childish' to fancy that eyes were to see with and sun to give light etc. Clarke's list of natural philosophers were neither fools nor children yet they argued for a final cause. On the importance of final causes in Boyle's work, see James G. Lennox, 'Robert Boyle's Defence of Teleological Inference in Experimental Science', *Isis* 74 (1983), 38 - 52.

Chapter Seven

Conclusion

According to Jacob and several other historians, the Boyle Lectures exemplify the marriage between moderate Anglicanism and Newtonianism in the late seventeenth and early eighteenth centuries. However, in chapter one it was argued that the Boyle Lectures do not illustrate this supposed 'holy alliance'. Instead Jacob and others have failed to identify the stated aims and intentions of these agonistic texts. They have also been mistaken in allowing the figure of Newton to dominate discussions of the Boyle Sermons. Newton's influence has provided these historians with a guiding hermeneutics, the Ariadne's thread, which signposts highly selective moments in late seventeenth and early eighteenth-century theological discourses. To counteract this Newtonian ideology I have emphasised, in the preceding chapters, the presence in the Sermons of hitherto neglected issues, especially the importance of theological language and the strategic deployment by divines of non-theological materials. The importance of positioning scholars within the history of scholarship has also been stressed. Likewise, I have endeavoured to pay due attention to the theological technicalities that dominated so many of the Boyle Sermons.¹

As we have seen in the cases of the Boyle Lecturers and the Trustees, Christian piety and virtue were the key issues that underpinned their scholarly practices and seemingly interminable disputes in which they engaged. Indeed, Boyle's endowment of the Lectureship stemmed from his own pious practices and his perception of the threats faced by weaker Christians. Charitable pursuits and the promotion of excellence in Christian scholarship were foremost concerns of Boyle and the Trustees he appointed to administer the Lectureship. Tenison and Evelyn were particularly concerned with honing scholarship in the defence of Christianity.

¹ Edward Arber, remarked that after the Restoration the majority of readers were 'the religious people, who, with their Sermons, their Treatises, and their Book Wars, kept the metropolitan Book Trade going', *The Term Catalogues* (London, 1903 - 6, i, p. xv), quoted in Irène Simon, *Three Restoration Divines: Barrow, South, Tillotson* (vol. i, Paris, 1967), p. i.

All the Lecturers we have examined in this study, without exception, were firmly established scholars prior to their selection. However, although piety was the key to understanding the involvement of Boyle, Evelyn and Tenison, it does not provide an adequate explanation of the subsequent history of the Lectureship. On the contrary, it has been argued that it is not possible to define the Lectureship by means of a single explanatory scheme. Thus Boyle's piety, from which the Lectureship originated, was not the motivating force of subsequent scholarly performances.

It was also shown in chapter three that the men who were closely connected with the Lectureship did not form a unified group purveying a coherent manifesto. It was argued that several factors, that have previously been lumped together, need to be treated separately by the historian: Boyle's intentions, the legal function of the Trustees, the career aims and scholarly ambitions of the Lecturers, and the enormous range of discursive materials found in the Sermons. The Trustees were not drawn solely from the Anglican church but included dissenters. What united them was the brief in Boyle's will. The Lecturers, on the other hand, were Anglicans, as Boyle's bequest was legally a benefice of the Anglican church. However, they did not express a common theological outlook, and were chosen according to the requirements of the brief specified in the relevant codicil.² Moreover, the suggestion that the Trustees were committed to an Anglican project of social control and that they used the Lectureship to insinuate an ideology *via* Newtonianism, does not receive support when we examine their choices of Lecturer. The Trustees had little personal contact with each other, they disagreed over candidates, and their individual professional and social locations diverged significantly.³ It has therefore been argued that the historical categories of 'Boyle Sermons', 'Boyle Lectureship', and 'Boyle's Lecture' are not analytically useful. A clear distinction must be drawn between the Lectureship - discussed in chapters two and three - and the Sermons, which were

² Gerard Reedy, in a recent study of Tillotson, shows how Sermons need not contain an epitome of a complete theological system, occasions demand specificity. The Boyle Lectures were a highly specific undertaking and need not have reflected a corporate theology or ecclesiology: the presence or absence of a particular doctrine signifies contingent requirements, this is especially true of the agonistic tenor of a defence of Christianity. See Reedy, 'Interpreting Tillotson', *Harvard Theological Review*, 86, (1993), 81-103.

³ For example, Evelyn insisted that 'till he [Bentley] be prevailed with to resume it [the Lectureship] again, we are to look for no greater progress from those who come after, how qualified soever the Gentleman may be whom you tell me has so long desired it'. This was in 1697, five years after Bentley gave the first series of Sermons, see Evelyn to Bentley, Wordsworth, *op. cit.*, i, 136.

examined in chapters four, five and six.

In these latter three chapters we saw that contrary to the Jacob thesis the Lecturers did *not* purvey a coherent and sustained programme of ecclesiastical social engineering on behalf of the Anglican Church. Newton's natural philosophy was not even mentioned in the majority of Sermons; where it was discussed, it was not the determining factor. In analysing the Sermons of Richard Bentley, John Harris and Samuel Clarke - which serve as crucial empirical support in Jacob's efforts to link Newtonianism and Anglican political thinking - the roles of Newtonian and of other forms of natural philosophy were precisely located. Yet the label 'Newtonian apologetics' has obscured almost the entire content of their Sermons and hindered analysis of their theological complexity. By contrast the present study has drawn attention to the issues present in the text, why they are there and the importance of both the matter and the manner of the individual Sermons. This re-location of the Lectureship helps prevent these Sermons being misinterpreted as a programme of natural theology or natural religion.⁴

Most studies of the Lectureship have concentrated on broad analytical categories, such as 'Anglicanism', 'Newtonianism', and 'Natural Theology'. The concentrated efforts of historians to forge connections between these blanket terms has precluded a more detailed investigation into the complex web of patronage, scholarship, and conceptual issues represented by the Lectureship. This study has, instead, concentrated on institutional interests, patronage networks and obligations, and the individual needs and scholarly idiosyncrasies of the Boyle Lecturers. The published Sermons were the result of a legal brief that directed the Lecturers to achieve victory over the enemies of religion - real or imagined. The chosen Lecturers used all available scholarly materials - theological, philological, philosophical and scientific in pursuit of their enemies. The Sermons were not intended primarily to persuade the enemy but to reassure believers that there was nothing to fear from metaphysical or theological alternatives.⁵ From their agonistic display of Christian

⁴ This is one of the main faults of the Jacob thesis. Her insistence that the construction of a 'natural' religion took place as an adjunct of a Latitudinarian theology is completely unfounded, and can only be sustained from a position which sees 'secularisation' as the natural consequence of the modern hegemonic discourse of science.

⁵ In his Boyle Sermons, Francis Gastrell describes the principal aims of his discourse - to order proofs and evidences to protect 'those who are yet innocent or indifferent', but who may

scholarship the Lecturers achieved further preferment and an opportunity to publish. The richness of the discursive materials and the diverse application of this material within the texts of the Sermons, ought to warn historians not to seek any simple relationship between science and religion.. Therefore, in dealing with the Sermons of Bentley, Clarke and Harris, particular attention has been paid to the precise use made of non-theological resources, particularly natural philosophy. For example, Clarke's appropriation of the mathematical way as the guarantor of the truth of doctrinal formulations and its concomitant power to command assent was not a simple deployment of science in the service of religion⁶ Moreover, science was common property and its appropriation was a matter of great urgency, since it had been used extensively by atheists.

The main themes of this thesis are reflected in the following passage from Simon Patrick's *A Brief Account* (1662), which Richard Kroll describes as having, 'by now achieved the status of a classic in English intellectual and cultural history'.⁷

Nor will it be possible otherwise to free Religion from scorn and contempt, if her Priests be not as well skilled in nature as the people, and her Champions furnished with as good Artillery as her enemies . . . How shall the clergy be able to maintain their credit with the ingenuous [sic] Gentry, who begin generally to be acquainted with the atomical Hypothesis, and know how to distinguish between a true Gemme and a *Bristol-Diamond*? Or how shall they encounter with the wits (as they are called) of the age, that assault Religion with new kinds of weapons?⁸

Patrick goes on to claim that the Church's 'Souldiers [sic]' should be armed with as

nevertheless be corrupted, and also 'to save those 'who are just entering upon the Ways of Irreligion' and 'may be further advanced and confirmed in them by more settled *Atheists*'. Thus, 'the Arguments made use of by the Perverters of Mankind may lose all their Power and Force upon others, by losing the Advantage of coming unanswered'. Francis Gastrell, *The Certainty and Necessity of Religion* (1697), Letsome and Nicholl, i, p. 282.

⁶ Much more work needs to be carried out on Clarke's claims to have utilised the mathematical way in theological argument, and to locate his reliance on the method of mathematical demonstration within the general context of mathematising natural philosophy. Funkenstein provides a highly abstract discussion of this issue in, *Theology and the Scientific Imagination from the Middle Ages to the Seventeenth Century* (New Jersey, 1986), esp. Chapter v, B, 'Construction and Metabasis, Mathematisation and Mechanisation', pp. 299 - 328. It might be fruitful to identify the institutional and scholarly motivations driving the project of mathematisation. Unfortunately Peter Dear's recent study, which goes some way towards addressing these issues, stops around 1700. See, *Discipline & Experience: The Mathematical Way in the Scientific Revolution* (Chicago, 1995).

⁷ Richard Kroll, et. al., eds., *Philosophy, Science, and Religion in England 1640 - 1700* (Cambridge, 1992), p. 1. S. P. [now accepted to be Simon Patrick], *A Brief Account of the New Sect of Latitude-men, Together with Some Reflections upon the New Philosophy* (Cambridge, 1662).

⁸ S. P. *op. cit.*, p. 24.

‘good brass and steel as their enemies’, and that the clergy should ‘fight them at their own weapons’, because by having truth and right on their side victory was assured. Patrick’s recognition that divines were engaged in conceptual warfare was a commonplace not only in the seventeenth century but also among the early Church Fathers.⁹ Thus when discussing how non-Christians know about the earth, and the heavens, and the things of nature, Augustine wrote:

Now it is a disgraceful and dangerous thing for an infidel to hear a Christian, presumably giving the meaning of Holy Scripture, talking nonsense on these topics; and we should take all means to prevent such an embarrassing situation, in which people show up vast ignorance in a Christian and laugh it to scorn.¹⁰

Although historians of science have not always recognised the importance of this agonistic aspect of Christian scholarship, the Boyle Sermons provide an excellent site for focusing on the manner in which divines constructed their defences and organised their strategic responses to systematic criticism. I have highlighted individual scholarly practice as a major factor in the production of the Sermons. Thus the *use* of materials in agonistic contexts has been prioritised. By contrast, those studies of the Lectureship that emphasise an ideological relationship between science and religion fail to appreciate the introduction of scientific theories into traditional oratorical contexts.¹¹

Whilst the approach adopted in this thesis has focused attention on individual scholarly productions, it has also sought to place scholars within their respective institutional networks. The institutional machinery of the Anglican church did not govern every aspect of its members’ activities. The networks of learning spread beyond the confines of narrow doctrinal formulation, engaging scholars in less identifiable but none the less coherent networks. Bruce Moran suggests that

[r]ather than insisting that the idea of an institution be limited exclusively to formal organisations, most historians would agree that any social

⁹ Compare the comments of a lesser known figure, ‘How can a Divine without Geometry answer an Atheistical Julian or a scoffing Lucian, that laugh at the arke for a Mosaicall figment, to be reported to contain Noah . . . ? Henry Thurmar, *A Defence of Humane Learning in the Ministry* (Oxford, 1660). Quoted in C. F. Richardson, *English Preachers and Preaching, 1640 - 70*, p. 187.

¹⁰ Augustine, *On the Literal Meaning of Genesis*, quoted in D. C. Lindberg, ‘Science and the Early Church’, in D. C. Lindberg and R. I. Numbers, eds., *God and Nature: Historical Essays on the Encounter between Christianity and Science* (Berkeley 1986), pp 19 - , p. 31.

¹¹ On the importance of inherited cultural resources as the base from which the rhetorical introduction of novel materials can be assessed, see Steven Shapin, ‘Personal Development and Intellectual Biography: the Case of Robert Boyle’, *BJHS*, 26 (1993), 335 - 45.

relationship organising information on the basis of an accepted natural order can be thought of as institutional.¹²

Although the Anglican concept of 'orthodoxy' conferred legitimacy, corporate experience, and opposition to the 'other', it did not restrict individual scholarly practices. Thus we cannot by a process of induction extract an essential theology or prioritise specific ingredients of the Boyle Sermons as indices of an overall commitment. The enemies of Christianity were as diverse and exotic as the discursive practices by which they were outlined and outlawed. The patronage system appropriated individual scholarly excellence, which was then deployed in easily identifiable institutional tasks. However, although the system of credit and reward was motivated by institutional pressure we are not entitled to infer that any institution can completely police its discursive resources.¹³ Conflicting interests - including scholarly interests - abound within institutions, and, as we have seen in the case of John Harris, relationships and philosophic interests were not fixed, but were subject to highly contingent factors. Scholars shifted allegiances and changed their literary ambitions in the light of possible career opportunities.¹⁴ An historiography which relies on a simple linear trajectory, charting the evolution of an individual's 'thought' is not adequate to explaining the scholarly behaviour of the Boyle Lecturers.

A further problem arises when historians apply rigid ideologically determinist labels, resulting in the application of dubious categories to explain the language and literary practice of the period. Anthony Grafton, among others, has persistently argued against this practice.¹⁵ Grafton claims that proclaiming their adherence to a

¹² Bruce T. Moran, *Patronage and Institutions: Science, Technology, and Medicine at the European Court, 1500 - 1750* (Woodbridge, 1991).p.1.

¹³ Mary Douglas's concept of 'fictive personality' is useful here, see *How Institutions Think* (London, 1987), p.9.

¹⁴ Goldgar *op. cit.*, p. 51. Goldgar comments that the increasing contact between scholars, engendered by the complex processes of co-operation in literary production and the reliance on the services of others, 'expanded the network of individual scholars and entangled them in more complex ties of indebtedness and obligation'.

¹⁵ Anthony Grafton, *Defenders of the Text: The Traditions of Scholarship in an Age of Science, 1450 - 1800* (Cambridge, Mass./London, 1991); Brian Vickers, 'The Royal Society and English Prose Style: A Reassessment', in Brian Vickers and Nancy S. Streuver, *Rhetoric and the Pursuit of Truth: Language Change in the Seventeenth and Eighteenth Centuries* (Los Angeles, 1985), pp. 3 - 76. In *The Material Word*, Richard Kroll specifically criticises supporters of the causal association between the plain style and the rise of modern science, see pp., 1 - 3.

solid, plain, real, and useful knowledge, such Anglican writers as Spratt and Glanvill misrepresented their stylistic programmes in their efforts to condemn the rhetorical practices of their opponents. A number of historians have perpetuated this misrepresentation and in the process the actual scholarly practice of Anglican divines has been obscured. However, Grafton continues, this clarion call was not honoured in practice, the claims of manifesto texts notwithstanding. Moreover, the continued practice of *disputatio* and the reliance on rhetorical skill demanded the very same exegetical devices which were purportedly under suspicion - *viz.*, the use of persuasive tropes, citations from authorities, an overriding concern with philological precision, and the production of endless divergent opinions on any issue. The period's obsession with texts and authorities was not abandoned because of a shifting of attitudes in favour of 'things', and although these authors claimed to employ only a plain style they continued to use rhetorical tropes and figures.¹⁶ The Boyle Lectures confirm this. In fact it is significant that the first Boyle Lecturer - Richard Bentley - was to become one of the most eminent classicists.¹⁷ By failing to acknowledge the intensity of this scholarly activity, some historians have ignored much of the substantive material and paid insufficient attention to the forms of argumentation. This has resulted in a characterisation of moderate Anglican theology as reasonable, plain, prudential and divorced from abstruse technical issues. Fortunately other historians and literary critics are now arguing for the complexity of Anglican texts in the period after the Restoration and have begun to take seriously the language and discursive strategies of theological discourse. My reading of the Boyle Sermons supports this salutary historiographical turn.

The following general points have emerged from the preceding chapters:

1. According to Boyle's stated intentions in the codicil, the lectureship was not designed to propagandise on behalf of the public image of science, 'Newtonian' or otherwise. Boyle's bequest did not demand - like the Earl of Bridgewater's in the 1830s - a programme demonstrating how Science harmonises with Religion.¹⁸

¹⁶ On this distinction, see Peter Dear, 'Totius in Verba: Rhetoric and Authority in the Early Royal Society', *Isis*, 76 (1985), 145 - 61.

¹⁷ Grafton, *op. cit.* pp. 12 - 21.

¹⁸ See Jonathan Topham, 'Science and Popular Education in the 1830's: the Role of the Bridgewater Treatises', *BJHS*, 25 (1992), 397 - 430. Topham argues for the complex use to which the Treatises were put, drawing a distinction between demonstrative natural theology, and science

2. Natural Philosophy was not a primary criterion for selection. Very few of the lecturers actually used 'science' in their performances (a fact pointed out by some commentators, including Larry Stewart).

3. 'Science' was never utilised within the context of its purported benefits either for social or political advantage: in fact natural philosophy was not prioritised over and above other topics in the Sermons. Science invariably had a precise tactically-specific function in the overall oratorical display and often formed part of an appropriation of the agonistic weaponry of opponents in order to show that all discursive knowledge was more effective in the hands of the righteous. For example, the use of 'gravity' in Bentley's arguments, and the concept of 'absolute space' in Clarke's were answers to specific philosophical claims made by their opponents. These concepts were never deployed in a general and unsystematic manner.¹⁹

4. In many instances the Sermons dealt with 'enemies' who were presenting a 'natural' or materialistic account, not only of the physical world, but also of Christian 'virtues'. This is why so much of the material in the Sermons was presented within a commonplace arena of competition for authority over classical sources. Furthermore, the nature of the material and the complexity of the arguments contradicts the characterisation of the Sermons as 'popular', since much of the material used in the Sermons came from elite cultural reservoirs, as did much of the material of Christianity's antagonists. The lecturers used their textual and exegetical skills to expose the 'fraudulent' scholarship of their opponents. Although the Sermons do not exhibit the characteristics of a systematic theological text they were, nonetheless not aimed at a popular audience. Since the deistic attack on Christianity often centred on the elite castly prerogatives of 'priestcraft', the defence, far from constructing a popularised 'natural religion' responded by reinforcing the revealed status of Christianity. To counter the deists' charge of obfuscation in propositions concerning the Christian mysteries, the Lecturers deployed their scholarly powers to demonstrate the *insufficiency* of 'nature' and 'reason', the *necessity* for an

made 'safe' through theological sanction. By contrast, the Boyle Lectures were never utilised in the systematic manner of the Treatises demonstrated in Topham's paper.

¹⁹ As a further exploration of this point it would be interesting to attempt a detailed examination of John Clarke's use of Newton, in his attack on Bayle, and to compare this with Bentley's use of Newton. Especially as these two figures are separated by quarter of a century, and John Clarke was chosen after Tenison's death by the successor Trustees.

institutionalised hierarchy, the need for professional hermeneutics and the absolute necessity of a 'standing' (that is a 'once only') divine revelation. This last point is particularly poignant as it was necessary to isolate Christianity from other religions - particularly Judaism - whilst, at the same time, claiming historical continuity with Judaism and appropriating its exegetical traditions. This is the arena in which many of the Lecturers deployed their scholarly skills.

5. Grafton draws attention to what he calls the 'personal and technical' agenda of polemical texts.²⁰ Thus, on the one hand, the form and content of the Boyle Sermons were the products of significant individual motivations and desires, where invective, competition, and sheer literary cruelty were not exercised solely to fulfil the demands of clerical responsibility. On the other hand the deployment of technical discourses by Anglican divines was undertaken in the face of a professionally conducted campaign of anti-Christian thought. These two elements go some way towards characterising the tenor of the Boyle Sermons and hence the literary responses of the individual protagonists in these debates cannot be reduced to an overall corporate manifesto. As Grafton points out scholars of any period are prisoners of their own personal 'tastes and obsessions, interests and insensitivities'. Anglican works of the period were driven as much by the desire to grapple with the enemy as they were undertaken from a sense of duty and the requirements of office. This aspect of scholarly life must be taken into consideration in analysing the Boyle Sermons.

To conclude, the main problem with the Jacob thesis lies in its reductionist approach to highly complex texts. A major theme in this thesis has therefore been the need to acknowledge the complexity of the Sermons and avoid any master historical narrative which incorporates the work of Bentley, Clarke, Harris and others. In discharging their scholarly duties, these divines made precise use of secular learning in the pulpit. However, the position of natural philosophy, including Newtonianism, was not so secure that its oratorical use was unproblematic. Its appearance in sermons was not the result of the Anglican church's support for science: natural philosophy - and *a fortiori* Newtonianism - was not a central element in the church's polemical repertoire. However, it was deployed in highly specific contexts, by particular preachers. The use of this suspect material within a novel situation - the

²⁰ *Op. cit.*, p. 13.

pulpit- is surely more interesting for historians, attempting to chart the relationship between science and religion, than the simplistic observation that Anglican divines defended the social and political status of the Anglican Church. The reductionist account is unable to offer a satisfactory explanation for the occasional use of science in the Sermons. By concentrating on individual scholarly contexts, this thesis has attempted to isolate the precise function of science by abandoning blanket terminology and broad historiographical categories. It has also sought to acknowledge the presence of a variety of sources - including both ancient and modern authorities- in the Sermons, since the complex nature of contemporary disputes produced the need for such a melange of discursive materials. A simplistic historiography will fail to appreciate that richness. This study has attempted to engage with the heterogeneous character of scholarly practice by analysing an important concrete site of theological disputation.

Bibliography

A. Primary Sources

- Baily, N. *Dictionarium Britannicum: Or, a more Complete UNIVERSAL ENGLISH DICTIONARY Than any Extant . . .* (2nd. ed., London, 1736).
- Baker, Thomas. *Reflections on Learning* (London, 1700).
- Barlow, Thomas. *Several Miscellaneous and Weighty Cases of Consciousness* (London, 1692).
- Barrow, Isaac. 'Of the Impiety and Imposture of Paganism and Mahometanism', in *The Theological Works of Isaac Barrow*, ed., by A. Napier (Cambridge, 9 vols., 1859), v, pp. 411 - 26.
- Barker, Matthew. *Natural Theology* (London, 1674).
- Bates, William. *A Funeral-Sermon for the Reverend, Holy and Excellent Divine, Mr. Richard Baxter, who deceased Decemb. 8, 1691 with some Account of His Life* (London, 1692).
- Baxter, Richard. *Directions for Weak Disperpered Christians to grow up to a Confirmed State of Grace . . .* (London, 1669).
- Bentley, Richard. *Some Letters Published from the University Library, Leyden*, ed., Elfriede Hulshoff Pol (Leiden, 1959).
Dr. Bentley's Proposals for Printing a New Edition of the Greek Testament, and St. Hierom's Latin Version. With a full answer to All the Remarks of a late Pamphleteer [i. e., Conyers Middleton] (London, 1721).
The Folly and Unreasonableness of Atheism demonstrated from the advantage and pleasure of a Religious Life, the Faculties of Human Souls, the Structure of Animate Bodies, the Origin and Frame of the World: in Eight Sermons preached at the lecture . . . in the year 1693 (London, 1693).
- Blackall, Offspring. *Eight Sermons, Preached at the lecture Founded by the Honourable Robert Boyle* (London, 1700), Letsome and Nicholl, *op. cit.*, i, pp. 525 - 625.
- Blount, Charles. *Anima Mundi* (London, 1679).
Miscellaneous Works of Charles Blount, Esq.: to which is Prefixed the Life of the Author and an account and vindication of his Death: with the contents of the whole volume (London, 1695).
The Oracles of Reason (London, 1693).
- Boyle, Robert. *The Works of the Honourable Robert Boyle*, ed., Thomas Birch (6 vols., London, 1772).
- Burnet, Gilbert. *A Sermon Preached at the Funeral of the Honourable Robert Boyle* (London, 1692).
A Discourse of the Pastoral Care (London, 1692).
- Burnet, Thomas *The Sacred Theory of the Earth: Containing An Account of the Original of the Earth . . .* (6th ed., London, 1726).
- Butler, Joseph. *Several letters to the Rev. Dr. Clarke from a gentleman in Gloucestershire relating to the first volume of the Sermons preached at Mr. Boyle's Lecture: with the Dr.'s answers thereunto* (London, 1716).
- Byrom, John. *The Private Journal and Literary Remains of John Byrom*, ed., R. Parkinson, (4 vols., Manchester, 1854-57), in *Chetham Society Remains*, vols., 32, 34, 40 and 44.
- Chambers, Ephraim. *CYCLOPAEDIA: or an Universal Dictionary of ARTS and SCIENCES* (2 vols., London, 1728).
- Charnocke, Stephen. *The Works of . . . S. Charnocke, being Several Discourses upon the*

- Existence and Attributes of God*, eds., Richard Adams and Edmund Veal (2 cols, London, 1684).
- Cheyne, George. *Philosophical Principles of Religion Natural and Revealed . . .* (London, 1715).
- Clarke, Samuel. *The Works of Samuel Clarke, D. D. Late Rector of St. James's Westminster* (4 vols., London, 1738).
- Jacobi Rohaulti Physica; latine vertit, recensuit et eberioribus iam Annotationibus, ex illustrissimi Isaaci Newtoni Philosophia maximam partem haustis, amplificavit et ornavit S. Clarke, S. T. P.* (London, 1697).
- Three Practical Essays on Baptism, Confirmation, and Repentance. Containing Full Instructions to a Holy Life; With Earnest Exhortations, especially to young Persons, drawn from the Consideration of the Severity of the Discipline of the Primitive Church* (London, 1699).
- Some Reflections on that Part of a Book called Amyntor, or, The Defence of Milton's Life, which relates to the Writings of the Primitive Fathers and the Cannon of the New Teatment: In a Letter to a Friend* (London, 1699).
- A Paraphrase on the four Evangelists. Wherein for the clearer understanding of the Sacred History, the whole text and paraphrase are printed in separate columns against each other. With critical notes on the more difficult passages. Very useful for families. In two volumes.* (London, 1701 - 2).
- A Demonstration of the Being and Attributes of God. More particularly in Answer to Mr. Hobbes, Spinoza and their Followers. Wherein the Notion of Liberty is stated, and the Possibility and Certainty of it proved, in Opposition to Necessity and Fate. Being the substance of eight Sermons, Preached in the Cathedral-Church of St. Paul, in the year 1704, at the Lecture founded by the Honourable Robert Boyle Esq.* (London, 1705).
- A Discourse concerning the unchangeable Obligations of Natural Religion, and the Truth and Certainty of the Christian Revelation. Being eight Sermons preached at the Cathedral-Church of St. Paul, in the Year 1705, at the lecture founded by the Honourable Robert Boyle, Esq.* (London, 1706).
- A Letter from the Reverend Dr. Samuel Clarke to Mr. Benjamin Hoadley, F. R. S. Occasion'd by the present Controversy among Mathematicians, concerning the Proportion of Velocity and Force in Bodies in Motion* (1728), in *Works*, iv, pp. 737 - 40.
- Clarke, John. *An Enquiry into the Cause and Origin of Evil: In which the Principal Phaenomenon of Nature are Explained, according to the True Principles of Philosophy: More particularly In Answer to Mr Bayle, and other Defenders of the Ancient Manichaeian Scheme of Two Independent Principles. Being the Substance of Eight Sermons preached at the Parish Church of Saint Mary Le Bow, in the Year 1719. At the Lecture founded by the Honourable Robert Boyle Esq.* (London, 1719), in Letsome and Nicholl, *op. cit.*, iii, pp. 152 - 211.
- Colliber, Samuel. *An Impartial Inquiry into the Existence and Nature of God: being a modest Essay towards a more intelligible Account of the Divine Perfections. With remarks on several Authors both Ancient and Modern . . . particularly . . . Clarke. In two books. with an Appendix concerning the nature of Space and Duration* (London, 1718).
- Cole, Elisha. *An English Dictionary. Explaining the difficult terms that are used in Divinity, Husbandry, Physick, Philosophy, Law, Navigation, Mathematics, and the Arts and Sciences . . .* (London, 1692).
- Collins, Anthony. *A Discourse of Free-thinking . . .* (London, 1713).
- A Discourse of the grounds and reason of the Christian Religion in two parts . . . second containing an Examination of the Scheme advance'd by Mr. Whiston . . .* [Anon., by A. collins] (London, 1724).

- A Discourse Concerning Ridicule and Irony in Writing* (London, 1729).
- Coward, William. *The grand assay: or, a vindication of reason, and religion against the impostures of philosophy. Proving according to those ideas and conceptions of things human understanding is capable of forming to itself. . .* (London, 1704).
- Creech, Thomas. *T. Lucretii cari De rerum natura* (London, 1682).
The Five Books of M. Manilius, Containing a System of Ancient Astronomy and Astrology: together with the Philosophy of the Stoicks . . . (London, 1697).
- Cudworth, Ralph. *The True Intellectual System: wherin all the Reason and Philosophy of Atheism is Confuted, and its Impossibility Demonstrated . . .* Translated by John Harrison (3 vols., London, 1845).
- Cumberland, Richard. *A Treatise of the Laws of Nature to which are prefix'd, An Introduction, concerning the Mistaken Notions the Heathens have of the Deity, and the defects in their Morality, whence the usefulness of Revelation may appear . . . made English from the Latin by John Maxwell* (London, 1727).
- Derham, William. *Physico-Theology: or, a Demonstration of the Being and Attributes of God, from the Works of Creation* (London, 1713).
Philosophical Letters Between the Late Learned Mr. Ray and Several of His Ingenious Correspondents (London, 1718).
- Ditton, Humphrey. *A Discourse concerning the Resurrection of Jesus Christ. In Three Parts . . . together with an Appendix concerning the impossible production of Thought, from Matter and Motion: The Nature of Humane souls, and of Brutes: the Anima Mundi, and the Hypothesis of the To Pan; as also, concerning divine Providence, the Origin of Evil, and the Universe in General* (London, 1712).
- Dove, John *A Confutation of Atheism* (London, 1605).
- Dugdale, Sir William. *The Antiquities of Warwickshire Illustrated . . . Revised by William Thomas* (2 vols., 1730).
- Eachard, John. *Mr. Hobbs's State of Nature Considered in a Dialogue between Philautus and Timothy. To which are added Five Letters, from the author of The Grounds . . .* (London, 1672).
The Grounds and occasions of the Contempt of the Clergy (London, 1670).
- Edwards, John. *Cometamantia: A Discourse of Comets* (London, 1684).
Brief Remarks on Mr. Whiston's New Theory of the Earth (London, 1693).
Some Thoughts Concerning the Several Causes and Occasions of Atheism (London, 1695).
Some brief Critical Remarks on Dr. Clarke's last Papers; which are his Reply to Mr. Nelson and an Anonymous Writer, and the Author of Some Considerations, etc. Shewing that the Doctor is as deficient in the Critical Art, as he is in Theology (London, 1714).
- Evelyn, John. *An Essay on the First Book of T. Lucretius Carus De Rerum Natura. Interpreted and made English Verse* (London, 1656).
Sylva, or a Discourse of Forest-Trees and the Propagation of Timber (3rd. ed., London, 1679).
Numismata, A Discourse of medals Ancient and Modern. Together with some Account of heads of Illustrious and Famous persons in Sculpture, and Taille-douce, of whom we have no Medals extant; and of the Use to be derived from them. To which is added A Digression concerning Physiognomy (London, 1697).
- Ferguson, Robert. *The Interest of Reason in Religion* (London, 1675).
- Fiddes, Richard. *Theologia Speculativa . . . principles of natural and revealed religion* (2vols, 1718-20).
- Fowler, Edward. *The Principles and Practices of certain Moderate Divines* (London, 1670).
- Gale, Theophilus. *At the Court of the Gentiles* (London, Pt. 1, 1672); all four parts completed in 1677.

- Gastrell, Francis. *Eight Sermons Preached at the Honourable Robert Boyle's Lecture.* (London, 1697).
- Glanvill, Joseph. *Essays on Several Important subjects in Philosophy and Religion* (1676).
A Letter to a Friend Concerning Aristotle, appended to Scire/e tuum nihil est: or, The Author's Defence of the Vanity of Dogmatising . . . (London, 1665).
An Essay Concerning Preaching: Written for the Direction of a young Divine (London, 1678).
- Gordon, George. *Dictionarium Britannicum. . . Collected by several Hands . . . the mathematical part by G. Gordon* (1730).
- s'Gravesande W. J. *Mathematical Elements of Natural Philosophy, Confirm'd by Experiments: Or, an Introduction to Sir Isaac Newton's Philosophy.* Translated, from Latin, by J. T. Desaguliers (6th. ed., 2 vols., London, 1747).
- Greene, Robert. *Encyclopaedia, or Method of Instructing Pupils* (Cambridge, 1707).
A Demonstration of the Truth and Divinity of the Christian Religion. . . (Cambridge, 1711).
The Principles of Natural Philosophy, in which is shown the Insufficiency of the present systems, to give us any just account of that science . . . (Cambridge, 1712).
The Principles of the Philosophy of the Expansive and Contractive Forces . . . (Cambridge, 1727).
- Hale, Matthew, Sir. *Observations touching the Principles of natural motion; and especially touching rarefaction and condensation: together with a reply to certain remarks touching the gravitation of fluids* (London, 1677).
The Works Moral and Religious . . . To which are prefixed his life and death by Bishop Burnet, D. D. and an appendix to the life, including the additional notes of Richard Baxter (London, 1805).
Difficiles nugae (London, 1674).
- Harris, John. Boyle Lectures (London, 1698), various titles, collected in Letsome and Nicholl, *op. cit.*, ii, pp. 355 - 434.
Remarks on some late papers, relating to the Universal Deluge: and to the Natural History of the Earth (London, 1697).
Lexicon Technicum: or An Universal English Dictionary of Arts and Sciences (2 vols., London: 1704 & 1710).
A Letter to the Faithful Triumverate [J. Friend, R. Mead, and S. Cade] in answer to that pretended to be written by Dr. Timothy Byfield: and showing reasons why Dr. Woodward should take no notice of it (London, 1719).
- Hasted, Edward. *The History and Topographical Survey of the County of Kent* (Canterbury, 4 vols., 1778 - 1799).
- Hobbes, Thomas. *A Briefe of the Art of Rhetorique* (London, 1637).
- Howard, Edward. *Remarks on the New Philosophy of Des-Cartes* (London, 1700).
- Jenkin, R. *The Reasonableness and Certainty of the Christian Religion* (2 vols., London, 1700).
- Ilis, Clement. *The Folly of Atheism Demonstrated, to the Capacity of the Most Unlearned Reader* (London, 1692).
- Jenkin, Robert. *The Reasonableness of the Christian Religion* (3rd. ed., 2 vols., London, 1708).
- Johnson, Samuel. *A Dictionary of the English Language: In which the Words are Deduced From Their Origin and Illustrated In Their different Significations by Examples From the Best Writers . . .* (2 vols., London, 1825).
- Keill, James. *An Account of Animal Secretion, the Quantity of Blood in the Humane Body, and muscular Motion &c.* (London, 1708).
- Keill, John. *An Introduction to Natural Philosophy: or, Philosophical Lectures Read in the University of Oxford, A. D. 1700. To which are added the DEMONSTRATIONS of Monsieur Huygens' Theorems concerning the Centrifugal Force and Circular*

- Motion* (London, 1720).
- Kidder, Richard. *Demonstration of the Messiah*, Preached at the Honourable Robert Boyle's Lecture (London, 1693), Letsome and Nicholl, *op. cit.*, i, pp. 89 - 152.
- Kippis, Andrew, ed., *Biographica Britannica . . . in the manner of Mr. Bayle's Historical and Critical Dictionary* (London, 6 vols., 1746 - 66).
- Layton, Henry. *Observations upon a sermon intituled, A Confutation of Atheism* (London, 1692).
- Le Grand, Antoine. *An Entire Body of Philosophy, According to the Principles of Renate Des Cartes*, trans., Richard Blome (London, 1694).
- Leland, John. *A view of the Principle Deistical writers . . .* (2 vols., London, 1755).
An answer to a book entitled, Christianity as Old as the Creation (2 vols., London, 1740).
- Leslie, Charles. *A Short and Easie Method with the Deists* (London, 1698).
Remarks on some late sermons (2nd ed., London, 1695).
The Charge of Socinianism against Dr. Tillotson (Edinburgh, 1695).
A Short and Easie Method with the Jews (London, 1715).
- Locke, John. *The Works of John Locke* (11th edition, 10 vols., London, 1812).
- Luttrell, Narcissus. *A Brief Historical Relation of State Affairs from September 1678 to April 1714* (6 vols., London, 1857).
- Midgley, Robert. *A New Treatise of Natural Philosophy* (London, 1687).
- Moore, John. *Sermons on Several Subjects. By the Bp. of Ely*, ed., Samuel. Clarke (2 vols., London, 1715 - 16).
- More, Henry. *A Collection of Several Philosophical Writings of Dr. Henry More. As namely, his Antidote against Atheism, Appendix to the said Antidote. Enthusiasmus Triumphatus. Letters to Descartes, &c. Immortality of the Soul. Conjectura Cabbalistica* (4th. ed., London, 1712).
- Morgan, Charles. *Six philosophical dissertations . . . published by Dr. Samuel Clarke, in his Notes upon Rohault's Physics. Done into English by Dr. John Clarke* (London, 1770).
- Newton, Isaac. *Sir Isaac Newton's Mathematical Principles of Natural Philosophy and His System of the World*, Andrew Motte's translation (1729), ed., Florian Cajori, (2 vols., Los Angeles, 1966).
Opticks: or, A Treatise of the Reflections, Inflections & Colours of Light (New York, 1979)
- Nichols, John. *Literary Anecdotes* ## (9 vols., 1812 - 15).
- Nieuventijt, Bernard. *The Religious Philosopher: or, the right use of contemplating the works of the Creator. Designed for the conviction of atheists and infidels*, trans. by J. J. Desaguliers. (1st. English ed., 2 vols., London, 1718-19).
A Discourse concerning Natural and Revealed Religion (London, 1696).
- Patrick, Simon. *The Works of Symon [sic] Patrick, D. D. sometime Bishop of Ely. Including his Autobiography*, ed., Alexander Taylor (9 vols., Oxford, 1858).
A Discourse of Profiting By Sermons . . . (London, 1684).
A Brief Account of the New Sect of Latitude-Men (London, 1662).
- Pett, Sir Peter, ed. *The Genuine Remains of that learned Prelate Dr. Thomas Barlow* (London, 1693).
- Phillips, Edward. *The New World of Words: or Universal English Dictionary, 7th. ed., revised, corrected and improved . . . by J. K. Philobibl.* (London, 1720).
- Pope, Walter. *The life of the Right Reverand Father in God Seth, Lord Bishop of Salisbury, and Chancellor of the Most Noble Order of the Garter. With a brief Account of Bishop Wilkins, Dr. Isaac Barrow, Mr. Lawrence Rooke, Dr. Turberville, and others* (London, 1697).
- Robertson, John M. *A Short History of Freethought Ancient and Modern* (2 vols., London, 1899).

- Saywell, William. *A Serious Inquiry into the Means of a Happy Unison: or, what Reform is Necessary to prevent Popery* (London, 1681).
- Sherburn, Edward. *The Sphere of Marcus Manilius made an English Poem: with Annotations and an Astronomical Appendix* (London, 1675).
- Skelton, Philip. *Ophiomaches, or Deism Revealed* [1749], ed., David Berman (2 vols., Bristol, 1990).
- Stanley, Thomas. *History of Philosophy* (London, 1655).
- Stephens, William. *An Account of the Growth of Deism in England* (London, 1696).
- Stillingfleet, Edward, *Origines Sacrae: or, a Rational Account of the Grounds of the Christian Faith, as to the Truth and Divine Authority of the Scripture* (London, 1662).
- Origines Sacrae: or, A Rational Account of the Grounds of Natural and Revealed Religion: Wherein The Foundations of Religion, and the Authority of the Scriptures, are Asserted and Clear'd. With An Answer to the Modern Deists* (London, 1709).
- Stubbe, Henry. *An Account of the Rise and Progress of Mahometanism*, ed., H. M. Khan Shairini (Lahore, 1954).
- Sutton, John. *Memoirs of the life and writings of the late Rev. Mr. John Jackson . . . with a particular account of his works, and some original letters which passed between him and Dr. Clarke, Mr. Whiston and other . . . writers . . . To which is added an appendix* (London, 1764).
- Taylor, Jeremy. *Holy Living and Holy Dying*, ed., by P. G. Stanwood (2 vols., Oxford, 1989).
- Tenison, Thomas. *The Creed of Mr. Hobbes Examin'd* (London, 1670).
- Of Idolatry: A Discourse in which is endeavoured a Declamation of, its Distinctions from Superstition; its Notions, Cause, Commencement, and Progress* (London, 1678).
- Baconiana . . . Or certain genuine remains of Sr. Francis Bacon . . . in arguments civil and moral, natural, medical, theological, and bibliographical; now for the first time faithfully published. An account of these remains, and all of his . . . other works, is given by the publisher, in a discourse by way of introduction* (London, 1679).
- A Sermon against Self-Love, etc. Preached before the Honourable House of Commons, 5 June, 1689. Being the Fast-Day, Appointed to implore the Blessing of Almighty God ... declared against the French King* (London, 1689).
- A Sermon Concerning the Folly of Atheism* (London, 1691).
- Thurmar, Henry. *A Defence of Humane Learning in the Ministry* (Oxford, 1660).
- Tillotson, John. *The Wisdom of Being Religious. A Sermon Preached at St. Paul's* [on Job xxviii, 28], (London, 1664),
- Toland, John. *The Theological and Philosophical Works of the late Mr. John Toland, being a system of Jewish, Gentile and Mahometan Christianity . . .* (London, 3 vols., 1732).
- A collection of several pieces of John Toland, now first publish'd from his original manuscripts: with some memoirs of his life and writings* (London, 2vols., 1726)
- Tong, William. *An account of the life and death of Mr. Matthew Henry, minister of the Gospel at Hackney, who dy'd June 22, 1714 . . .* (1716).
- Turner, John. *The Wisdom of God in the Redemption of Man. Eight Sermons, Preached at the Lecture Founded by the Honourable Robert Boyle* (London, 1708), in Letsome and Nicholl, op. cit., ii, pp. 351 - 428.
- Wallis, John. *Hobbius Heauton-timorumenos: or, A consideration of Mr. Hobbes his Dialogues. In an Epistolary Discourse, Addressed to the Honourable Robert Boyle* (Oxford, 1662).
- Ward, Seth. *A Philosophical Essay Towards an Eviction of the Being and Attributes of God, the Immortality of the Souls of Men, the Truth and Authority of Scripture* (5th ed., London, 1677).

- An Apology for the Mysteries* (London, 1673).
- Warton, Thomas. *Life and Literary Remains of Ralph Bathurst &c.* (London, 1761).
- Watson, G. *Remarks on John Locke by Thomas Burnet* (Brynmill, 1989).
- Watt, Robert. *Bibliotheca Britannica* (4 vols., Edinburgh, 1824).
- Watts, Isaac. *Philosophical Essays on Various Subjects . . . With some Remarks on Mr. Locke's Essay on the Human Understanding. To which is subjoined, A brief Scheme of Ontology, or the Science of Being in general; with its Affections* (6th. ed., London, 1763).
- Logick, or, The Right use of Reason* (2nd. ed., London, 1726)
- Wells, Edward. *A Second Letter to the Reverend Dr. Clarke . . . or answer to the close of his reply to Mr. Nelson, wherein notice is taken of Mr. Clarke's foul quotations [and a postscript on Clarke's notions of self-existence and supremacy]* (London, 1715).
- William Whiston, *Historical Memoirs of the Life and Writings of Dr. Samuel Clarke, Including certain Memoirs of several of his Friends* (3rd. ed., London, 1748).
- Memoirs of the Life and Writings of Mr. William Whiston. Containing Memoirs of several of his Friends also* (3 vols., London, 1749 - 50).
- The Accomplishment of Scripture Prophecies. Being Eight Sermons Preached at the Cathedral Church of St Paul; in the Year 1707 at the Lecture Founded by the Honourable Robert Boyle, Esq; With an Appendix . . .* (London, 1707), in Letsome and Nicholl, *op. cit.*, iii, pp. 258 - 348.
- Wilkins, John. *Of the Principles and duties of Natural Religion* (London, 1675).
- Ecclesiastes: or a Discourse Concerning the Gift of Preaching, as it falls under the Rules of Art* (7th. ed., London, 1693).
- Williams, John. *Twelve Sermons Preached at the Honourable Robert Boyle's Lecture* (London, 1696), Letsome and Nicholl, *op. cit.*, i, pp. 153 - 274.
- Wood, Anthony. *The Life and Times of Anthoy à Wood*. Abridged from Andrew Clarke's edition and with an Introduction by Llewelyn Powys (London, 1961).
- Woodward, John. *An Essay Towards a Natural History of the Earth* (London, 1695).
- Woodward, Josiah, *An Account of the Rise and Progress of the Religious Societies* (London, 1698).

B. Secondary Sources

- Abbey, C. J. *The English Church and its Bishops 1700 - 1800* (2 vols., London, 1887).
- Abraham, Gary A. 'Misunderstanding the Merton Thesis', *Isis*, 74 (1983), 368 - 87.
- Addy, J. *Sin and Society in the Seventeenth Century* (London, 1989).
- Death, Money and the Vultures: Inheritance and Avarice, 1660-1750* (London/New York, 1992).
- Albury, W. R. 'Halley's Ode on the *Principia* of Newton and the Epicurean Revival in England', *J. Hist. Ideas*, 39 (1978), 24 - 43.
- Alexander, H. G. *The Leibniz-Clarke Correspondence* (Manchester, 1956).
- Allen, Don Cameron. *Doubt's Boundless Sea: Scepticism and Faith in the Renaissance* (Baltimore, 1964).
- Mysteriously Meant: The Rediscovery of Pagan Symbolism and Interpretation in the Renaissance* (Baltimore, 1970).
- Ashcraft, Richard, *Revolutionary Politics and Locke's Two Treatises of Government* (New Jersey, 1986).
- Atkinson, A. D. 'William Derham, F. R. S. (1657-1735)', *Annals of Science*, 8 (1952), 368 - 92.
- Attfield, Robin, 'Christian Attitudes to Nature', *J. Hist. Ideas*, 44 (1983), 369 - 86.
- Aubrey, John. *Brief Lives . . .*, ed., A. Clarke (2 vols., Oxford, 1898).
- Aylmer, G. E. 'Unbelief in Seventeenth-Century England', in, Donald Pennington and Keith Thomas, eds., *Puritans and Revolutionaries: Essays in Seventeenth-Century History Presented to Christopher Hill* (Oxford, 1978), pp. 22 - 46.

- Baker, John Tull. *An Historical and Critical Examination of English Space and Time Theories from Henry More to Bishop Berkeley* (New York, 1930).
- Barbour, Ian G. *Issues in Science and Religion* (New Jersey, 1966).
- Barlow, Richard Burgess. *Citizenship and Conscience: A Study in the Theory and practice of Religious Toleration in England during the Eighteenth Century* (Philadelphia, 1962).
- Barker, Peter and Roger Ariew, eds. *Revolution and Continuity: Essays in the History and Philosophy of Early Modern Science* (Washington, 1991).
- Barnes, Jonathan, ed. *The Complete Works of Aristotle* (2 vols., New Jersey, 1984).
- Bartholomew, A. T. *Richard Bentley, D. D.: A Bibliography of his works and of all the Literature called forth by his acts or Writings. With an Introduction and Chronological Table by J. W. Clarke* (Cambridge, 1908).
- Baumer, Anne, ed. *Science and Religion / Wissenschaft und Religion* (Bochum, 1989).
- Beck D. A. 'Miracles and the Mechanical Philosophy: the Theology of Robert Boyle in its Historical Context', PhD thesis (University of Notre Dame, 1986).
- Ben-Amos, Ilana Krausman. *Adolescence and Youth in Early Modern England* (New Haven/London, 1994).
- Benjamin, Andrew E, Geoffrey N. Cantor, and John R. R. Christie, eds. *The Figural and the Literal: Problems of Language in the History of Science and Philosophy 1630 - 1800* (Manchester, 1987).
- Bennet, G. V. 'The Patristic Tradition in Anglican Thought, 1600 - 1900'. *Oecumenica* (Gütersloh, 1971 - 2).
'University, Society and the Church 1688 - 1714', in L. S. Sutherland and L. G. Mitchell, eds., *History of the University of Oxford: V The Eighteenth Century*, (Oxford, 1986).
- Bentley, Jerry H. *Humanists and Holy Writ: New Testament Scholarship in the Renaissance* (Princeton, 1983).
- Berman, David. 'On the Art of Theological Lying', in J. A. Leo Lemay, ed., *Deism, Masonry, and the Enlightenment* (Delaware, 1987), pp. 61 - 78.
A History of Atheism in Britain (London, 1988).
'The Repressive Denials of Atheism in Britain in the Seventeenth and Eighteenth Centuries', *Proceedings of the Royal Irish Academy*, 82 (1982), 211 - 45.
'At the Roots of Unbelief', *J. Hist. Ideas*, 56 (1995), 555 - 75.
- Blair, Ann. 'Humanist Methods of Natural Philosophy: The Commonplace Book', *J. Hist. Ideas*, 53 (1992), 541 - 51.
- Blakiston, H. E. D. *Trinity College* (Oxford, 1898).
- Booth, Wayne C., ed. *The Knowledge Most Worth Having* (Chicago, 1967).
- Bosher, Robert S. *The Making of the Restoration Settlement: The Influence of the Laudians, 1649-1662* (London, 1951).
- Bowles, Geoffrey. 'Physical, Human and Divine Attraction in the Life and Thought of George Cheyne', *Annals of Science*, 31 (1974), 473 - 88.
'John Harris and the Powers of Matter', *Ambix*, 22 (1975), 21 - 38.
'The Place of Newtonian Explanation in English Popular Thought, 1687-1727', D. Phil. (University of Oxford, 1977).
- Brandt, Frithiof. *Thomas Hobbes' Mechanical Conception of Nature* (Copenhagen/London, 1928).
- Braur, George C. Jr. *The Education of a Gentleman: Theories of Gentlemanly Education in England, 1660 - 1775* (New York, 1959).
- Bray, William. *Diary and Correspondence of John Evelyn, to which is Subjoined the Private correspondence between King Charles I and Sir Edward Nicholas . . . Edited from the Original Manuscripts at Wotton* (4 vols, London, 1854).
- Bredvold, L. I. *The Intellectual Milieu of John Dryden* (Chicago, 1934).
- Brewster, Sir David. *Memoirs of the Life, Writings and Discoveries of Sir Isaac Newton* (2

- vols., London, 1855).
- Brink, C. O. *English Classical Scholarship: Historical Reflections on Bentley, Porson, and Housman* (Oxford, 1985).
- Brockliss, L. W. B. 'Aristotle, Descartes, and the New Science; Natural Philosophy at the University of Paris, 1600-1740', *Annals of Science* 38 (1981), 33-77.
- Brooke, John Hedley. 'Science and the Fortunes of Natural Theology: Some Historical Perspectives', *Zygon* 24 (1989), 3 - 22.
Science and Religion: Some Historical Perspectives (Cambridge, 1991).
Review of John Gascoigne's *Cambridge in the Age of the Enlightenment: Science, Religion and Politics from the Restoration to the French Revolution* (Cambridge, 1989), in *Enlightenment and Dissent*, 9 (1990), 125 - 29.
- Brooks, Richard Stoddard. 'The Relationships Between Natural Philosophy, Natural Theology and Revealed Religion in the thought of Newton and their Historiographic Relevance', Ph. D. thesis (North Western University, 1976).
- Buckley, Micheal J. *Motion and Motion's God: Thematic Variations in Aristotle, Cicero, Newton and Hegel* (Princeton, 1971).
At the Origins of Modern Atheism (New Haven/London, 1987).
'God in the Project of Newtonian Mechanics', in G. V. Coyne, S. J. M. Heller, and J. Zycinski, eds., *Newton and the New Direction in Science* (Vatican City, 1988), pp. 85 - 105.
- Burke, John G, ed. *The Uses of Science in the Age of Newton* (California, 1983).
- Burnett, G. A. 'The Reputation of Cicero among the English Deists, 1696 - 1776', PhD thesis (University of Southern California, 1947).
- Burns, R. M. *The Great Debate on Miracles: from Joseph Glanvill to David Hume* (London/Toronto, 1981).
- Burwick, Frederick, ed. *Approaches to Organic Form* (Dordrecht, 1987).
- Cantor, Geoffrey N. 'The Eighteenth Century Problem', a review of G. S. Rousseau and Roy Porter, eds., *The Ferment of Knowledge: Studies in the Historiography of Eighteenth Century Science* (Cambridge, 1980), in *HS*, 20 (1982), 44 - 63.
'The Rhetoric of Experiment' in David Gooding, et al., eds., *The Uses of Experiment: Studies in the Natural Sciences* (Cambridge, 1989), pp. 159 - 80.
- Carpenter, E. *Thomas Tenison, Archbishop of Canterbury: His Life and Times* (London, 1948).
- Carpenter, Ronald H. *History as Rhetoric: Style, Narrative, and Persuasion* (S. Carolina, 1995).
- Carroll, R. T. *The Common-Sense Philosophy of Religion of Bishop Edward Stillingfleet, 1635-1699* (The Hague, 1975).
- Carswell, John. *The South Sea Bubble* (London, 1961).
- Cassini, P. 'Newton: The Classical Scholia', *HS*, 12 (1984), 1 - 56.
- Champion, J. A. I. *The Pillars of Priestcraft Shaken: The Church of England and its Enemies, 1660 - 1730* (Cambridge, 1992).
- Chandler, James, Arnold L. Davidson and Harry Harootunian, eds. *Questions of Evidence: Proof, Practice, and Persuasion accross the Disciplines* (Chicago/London, 1994).
- Clarke, J. C. D. *English Society 1688 - 1832: Ideology, Social Structure and Political Practice during the Ancien Regime* (Cambridge, 1985).
Revolution and Rebellion. State and Society in the Seventeenth and Eighteenth Centuries (Cambridge, 1986).
The Language of Liberty 1660 - 1832: Political Discourse and Social Dynamics in the Anglo-American World (Cambridge, 1994).
- Clarke, T. E. S. and Foxcroft, H. C. *A Life of Gilbert Burnet, Bishop of Salisbury* (Cambridge, 1907).
- Claydon, Tony. *William III and the Godley Revolution* (Cambridge, 1996).
- Clericuzio, Antonio. 'A Redefinition of Boyle's Chemistry and Corpuscular Philosophy',

- Annals of Science*, 47 (1990), 561 - 89.
- Clarke L. W. Lowther. *Eighteenth Century Piety* (London, 1944).
- Chamberlain, Jeffrey S. 'The Limits of Moderation in a Latitudinarian Parson: or, High-Church Zeal in a Low Churchman Discover'd' in, Roger D. Lund, ed., *The Margins of Orthodoxy: Heterodox Writing and Cultural Response, 1660 - 1750* (Cambridge, 1995), pp. 195 - 215.
- Cochrane, C. N. *Christianity and Classical Culture* (New York, 1957).
- Cohen, I. B. *Isaac Newton's Papers and Letters on Natural Philosophy and Related Documents* (Cambridge, 1958).
- Puritanism and the Rise of Modern Science: The Merton Thesis* (New Brunswick/London, 1990).
- Cohen, Jonathan. *The Probable and the Provable* (London, 1977).
- Coleby, L. M. J. 'John Francis Vigani, First Professor of Chemistry in the University of Cambridge', *Annals of Science*, 8 (1952), 46 - 60.
- Colie, Rosalie. 'Spinoza and the Early English Deists', *J. Hist. Ideas*, 20 (1959), 23 - 46.
- 'Spinoza in England, 1665-1730', *Proceedings of the American Philosophical Society*, 107 (1963),
- Copenhaver, Brien P. 'Jewish Theologies of Space in the Scientific Revolution: Henry More, Joseph Raphson, Isaac Newton and their Predecessors', *Annals of Science*, 37 (1980), 489 - 548.
- Cottingham, John, ed. *The Cambridge Companion to Descartes* (Cambridge, 1992).
- Coudert, Allison. 'A Cambridge Platonist's Kabbalist Nightmare', *J. Hist. Ideas*, 36 (1975), 633 - 652.
- Courtney, William J. *Capacity and Volition: A History of the Distinction of Absolute and Ordained Power* (Bergamo, 1990).
- Craig, William Lane. *The Historical Argument for the Resurrection of Jesus during the Deist Controversy* (New York, 1985).
- Crane, R. S. 'Anglican Apologetics and the Idea of Progress', *Modern Philology*, 31 (1934), 273 -306; 349 - 82.
- Crockett, Bryan. *The Play of Paradox: Stage and Sermon in Renaissance England* (Philadelphia, 1995).
- Cromartie, Alan. *Sir Matthew Hale, 1609 - 1676: Law, Religion and Natural Philosophy* (Cambridge, 1995).
- Cunningham, Andrew. 'How the *Principia* Got its Name: Or, Taking Natural Philosophy Seriously', *History of Science* 29 (1991), 377 - 92.
- Curley, E. M. *Descartes Against the Skeptics* (Cambridge, Mass., 1978).
- Curry, Patrick, ed. *Astrology, Science and Society: Historical Essays* (Suffolk, 1987).
- Daniel, Stephen H. *John Toland: His Methods, Manners, and Mind* (Kingston/Montreal, 1984).
- de Beer, E. S. *The Diary of John Evelyn: Now first printed in full from the manuscripts belonging to Mr. John Evelyn* (6 vols., Oxford, 1955).
- Correspondence of John Locke* (8 vols., Oxford, 1976).
- De Krey Gary Stuart, 'Trade, Religion, and Politics in London in the Reign of William III.', PhD thesis, University of Princeton (2 vols., Michigan/London, 1978).
- Dear, Peter. 'Totius in Verba: Rhetoric and Authority in the Early Royal Society', *Isis*, 76 (1985), 145 - 61.
- 'Miracles, Experiments and the Ordinary Course of Nature', *Isis*, 81 (1990), 663 - 683.
- Discipline & Experience: The Mathematical Way in the Scientific Revolution* (Chicago, 1995).
- Dham, John Johannes. 'Science and Religion: The Early Boyle Lectures and the Bridgewater Treatises', Ph. D. thesis (Case Western Reserve University, 1969).
- 'Science and Apologetics in the Early Boyle Lectures', *Church History*, 39 (1970), 172 - 86.

- Dillon, George L. *Contending Rhetorics* (Indiana, 1991).
- Dobbs, B. J. 'Newton's Alchemy and his "active principle" of gravitation', in, *Newton's Scientific and Philosophical Legacy*, eds., P. B. Scheurer and G. Debrock (Dordrecht, 1988), pp.
- Douglas, David C. *English Scholars, 1660-1730* (2nd. ed., London, 1951).
- Douglas, Mary. *Purity and Danger: An Analysis of concepts of Pollution and Taboo* (London, 1966).
- How Institutions Think* (London, 1987).
- Duffy, Eamon. " 'Whiston's Affairs': The Trials of a Primitive Christian 1709-14", *Journal of Ecclesiastical History*, 27 (1976), 129 - 50.
- 'Primitive Christianity Revived: Religious Renewal in Augustan England', *Studies in Church History*, vol. 14 (1977), 287 - 300.
- 'Valentine Greatrakes, the Irish Stroker: Miracle Science and Orthodoxy in Restoration England' *Studies in Church History*, 17 (1981), 251 - 73.
- Eagles, C. M. 'David Gregory and Newtonian Science', *BJHS*, 10 (1977), 216 - 25.
- Edleston, J. ed. *Correspondance of Sir Isaac Newton and Professor Cotes* (London, 1850).
- Emerton, Norma E. *The Scientific Interpretation of Form* (Ithaca/London, 1984).
- Emery, Frank Vivian. *Edward Lhuyd F. R. S., 1660 - 1709* (Caerdydd, 1971).
- Every, G. *The High Church Party 1688 - 1718* (London, 1956).
- Farrell, Maureen. *William Whiston* (New York, 1981).
- Feingold, Mordechai, ed. *Before Newton: The Life and Times of Isaac Barrow* (Cambridge, 1990).
- The Mathematician's Apprenticeship. Science, Universities and Society in England, 1560 - 1640* (Cambridge, 1984).
- 'Newton, Leibniz, and Barrow Too: An Attempt at a Reinterpretation', *Isis*, 84 (1993) 310-38.
- Ferguson, James P. *The Philosophy of Dr. Samuel Clarke and its Critics* (London, 1974).
- An Eighteenth Century Heretic: Dr. Samuel Clarke (Warwick, 1976).
- Field, J. V. and A. J. L. James, eds., *Renaissance and Revolution: Humanists, Scholars, Craftsmen, and Natural Philosophers in Early Modern Europe* (Cambridge, 1994).
- Fisch, Harold. 'The Scientist as Priest', *Isis*, 44 (1953), 252 - 65.
- Fisher, Howard J. 'Faraday's two voices', *Physis*. 29 (1992), Nuova Serie, Fasc. 1: 165-186.
- Fisher, M. S. *Robert Boyle, Devout Naturalist* (Philadelphia, 1945).
- Force, James E. *William Whiston: Honest Newtonian* (Cambridge, 1985).
- 'The Origins of Modern Atheism', *J. Hist. Ideas*, 50 (1989), 153 - 62.
- and Richard H. Popkin, eds., *The Books of Nature and Scripture: Recent Essays on Natural Philosophy, Theology, and Biblical in the Netherlands of Spinoza's Time and the British Isles of Newton's Time* (Dordrecht/Boston/London, 1994).
- Foss, Edward. *The Judges of England; With Sketches of their Lives . . .* (9 vols., New York, 1966: facsimile reprint of the original publication, vols. 1 - 6, 1848, vols., 7 - 9, 1864),
- Foucault, Michel. *Discipline and Punish: The Birth of the Prison*, translated from the French by Alan Sheridan (Harmondsworth, 1991).
- Power Knowledge: Selected Interviews and Other Writings*, ed., Colin Gordon (New York, 1980).
- Fox, Adam. *John Mill and Richard Bentley: A Study of the Textual Criticism of the New Testament 1675 - 1729* (Oxford, 1954):
- Fox, Christopher. *Locke and the Scriblerians* (California, 1988).
- Foxcroft, H. C. *Supplement to Burnet's 'History of My Own Time'* (Oxford, 1902).
- Frank, R. G. *Harvey and the Oxford Physiologists* (Berkeley, 1980).
- H. Frere, William. *A Devotionarie Book of John Evelyn . . . Now first published with an Introduction by W. Frere* (London, 1936).
- Funkenstein, Amos. *Theology and the Scientific Imagination from the Middle Ages to the*

- Seventeenth Century* (Princeton, 1986).
- Gabby, Alan. 'Philosophia Cartesiana triumphata; Henry More (1646 - 1671)', J. Lennon et al., eds., *Problems of Cartesianism* (Montreal, 1982), pp. 171 - 250.
- 'The Mechanistical Philosophy and its Problems: Mechanical Explanation, Impenetrability and Perpetual Motion', in J. C. Pitt, ed., *Change and Progress in Modern Science* (Dordrecht, 1985), pp. 9 - 84.
- 'Between *Ars* and *Philosophia Naturalis*: Reflections on the Historiography of Early Modern Mechanics', in J. V. Field and Frank A. J. L. James, eds., *Renaissance and Revolution; Humanists, Scholars, Craftsmen and natural Philosophers in Early Modern Europe* (Cambridge, 1994), pp. 133 - 46.
- Garber, Daniel. 'How God Causes Motion: Descartes, Divine Sustenance, and Occasionalism', *The Journal of Philosophy* 84 (1987), 567 - 80.
- Descartes' Metaphysical Physics* (Princeton, 1992).
- Gascoigne, John. 'From Bentley to the Victorians; the Rise and Fall of Newtonian Natural Theology', *Science in Context*, 2 (1988), 219 - 55.
- Cambridge in the Age of the Enlightenment: Science, Religion, and Politics from the Restoration to the French Revolution* (Cambridge, 1989).
- 'The Wisdom of the Egyptians' and the Secularisation of History in the Age of Newton', in Gaukroger (1991), pp. 171 - 212
- Gaukroger, Stephen. *The Uses of Antiquity: The Scientific Revolution and the Classical Tradition*, (Dordrecht, Boston/London, 1991).
- Descartes: An Intellectual Biography* (Oxford, 1995).
- Gay, Peter. *The Enlightenment. An Interpretation* (2 vols., London, 1970).
- Geertz, Clifford *The Interpretation of Culture* (New York, 1973).
- Gieryn, Thomas F, ed. *Science and Social Structure: A Festschrift for Robert K. Merton* (New York, 1980).
- Gilbert, Neal W. *Renaissance Concepts of Method* (New York/London, 1963).
- Gillespie, N. C. 'Natural History, Natural Theology, and Social Order: John Ray and the 'Newtonian Ideology'', *Journal of the History of Biology*, 20 (1987), 1 - 50.
- Glacken, Clarence J. *Traces on the Rhodian Shore* (Berkeley, 1967).
- Goldgar, Anne. *Impolite Learning: Conduct and Community in the Republic of Letters 1680 - 1750* (New Haven/London, 1995).
- Golinski, Jan. 'The Theory of Practice and Practice of Theory: Sociological Approaches in the History of Science', *Isis*, 81 (1990), 492 - 505.
- 'Contending Rhetorics: The Rhetorical Maelstrom', *Isis*, 84 (1993), 746 - 49.
- Goold, G. P., ed. [Richard Bentley's] *Epistola ad Millium*. Reprinted from the edition of Alexander Dyce, together with an Introduction by G. P. Goold (Toronto, 1962).
- Gordon, Cyrus H. *The Common Background of Greek and Hebrew Civilization* (New York, 1965).
- Gowing, Ronald. *Roger Cotes - Natural Philosopher* (Cambridge, 1983).
- Grafton, Anthony. *Defenders of the Text: The Traditions of Scholarship in an Age of Science, 1450 - 1800* (Cambridge, Mass./London, 1991).
- Grant, Edward. *Much Ado About Nothing: Theories of Space and Vacuum from the Middle Ages to the Scientific Revolution* (Cambridge, 1981).
- Grant, Patrick. *Literature and the Discovery of Method in the English Renaissance* (Athens, Georgia, 1985).
- Grassby, Richard. *The Business Community of Seventeenth-Century England* (Cambridge, 1995).
- Green, I. M. *The Re-establishment of the Church of England* (Oxford, 1978).
- Green Robert A. 'Henry More and Robert Boyle on the Spirit of Nature', *J. Hist. Ideas*. 23 (1962) 451-74.
- 'Whichcote, Wilkins, "Ingenuity", and the Reasonableness of Christianity', *J. Hist. Ideas*. 42 (1981) 227-52.

- Grinnell, G. 'Newton's *Principia* as Whig Propaganda', in Fritz, P. and D. Williams, eds., *City and Society in the Eighteenth Century* (Toronto, 1973), pp. 181 - 92.
- Gross, Alan. *A Rhetoric of Science* (Cambridge, Mass./London, 1990).
 'Rhetoric of Science without Restrictions', *Rhetorica*, 9 (1991), 283 - 99.
- Guerlac, Henry. *Essays and Papers in the History of Modern Science* (Baltimore, 1977).
 and M. C. Jacob, 'Bentley, Newton and Providence' *J. Hist. Ideas*, 30 (1969), 307 - 18.
- Guerrini, Anita. 'Newtonian Matter Theory, Chemistry and Medicine 1690 -1713', PhD thesis (Indiana University, 1983).
 'John Keill, George Cheyne and Newtonian Physiology 1690 - 1740', *Journal of the History of Biology*, 18 (1985), 247 - 66.
 'The Tory Newtonians: Gregory, Pitcairne, and Their Circle', *Journal of British Studies*, 25 (1986), 288 - 311.
- Gunther, R. W. T., ed. *John Ray: Further Correspondence* (London, 1928).
- Hadznits, George Depue. *Lucretius and his Influence* (New York, 1935).
- Hall, A. R and M. B. Hall, eds. *Unpublished Scientific Papers of Isaac Newton: A Selection from the Portsmouth Collection in the University Library, Cambridge* (Cambridge, 1962).
- Hall, M. B. 'The Establishment of the Mechanical Philosophy', *Osiris*, 10 (1952), 412 - 541.
Robert Boyle on Natural Philosophy (Bloomington, 1965),
- Haller, William. *The Rise of Puritanism: Or, The Way to the New Jerusalem as Set Forth in Pulpit and Press from Thomas Cartwright to John Lilbourne and John Milton, 1570-1643* (New York/Evanston/London, 1938).
- Hans, Nicholas. *New Trends in Education in the Eighteenth Century* (London, 1951).
- Harrison, C. T. 'Bacon, Hobbes, Boyle, and the Ancient Atomists', *Harvard University Studies and Notes in Philology and Literature*, 15 (1933), 191 - 218.
 'The Ancient Atomists and the English Literature of the Seventeenth Century', *Harvard Studies in Classical philology*, 45 (1934), 1 - 79.
- Harrison, Peter. 'Newtonian Science, Miracles, and the Laws of Nature', *J. Hist. Ideas*, 56, (1995), 531 - 53.
- Harrison, Peter. *'Religion' and the Religions in the English Enlightenment* (Cambridge, 1990).
- Hart, A. T. *William Lloyd, 1627-1717: Bishop, Politician, Author and Prophet* (London, 1952).
- Harwood, John, ed., *The Early Essays and Ethics of Robert Boyle*. Edited and Annotated by John T. Harwood (Carbondale/Edwardsville, 1991).
- Hatfield, Gary. 'Force (God) in Descartes' Physics', *Studies in the History and Philosophy of Science*, 10 (1979), 113 - 40.
- Hazard, Paul. *European Thought in the Eighteenth Century* (Harmondsworth, 1965).
- Healy, Robert M. 'The Jew in Seventeenth-Century Thought', *Church History*, 46 (1977), 63 - 79.
- Hearne, Thomas. *Remarks and Collections of Thomas Hearne* (Oxford, 11 vols., 1885 - 1921).
The Remains of Thomas Hearne: Reliquiae Hearnianae, being Extracts from his MS Diaries. Compiled by Philip Bliss. Now newly Revised by John Buchanan-Brown (London, 1966).
- Heilbron, John. *Physics at the Royal Society during Newton's Presidency* (Berkeley, 1983).
- Heimann, P. M. 'Science and the English Enlightenment', *HS*, 16 (1978), 147 - 51.
- Henry, John. 'A Cambridge Platonist's Materialism: Henry More and the Concept of the Soul', *Journal of the Warburg and Courtauld Institute*, 49 (1986), 172 - 95.
 'Occult Qualities and the Experimental Philosophy: Active Principles in Pre-Newtonian Matter Theory', *HS* 24 (1986), 335 - 81.

- 'Henry More versus Robert Boyle: the Spirit of Nature and the Nature of Providence', in Sarah Hutton, ed., *Henry More (1614-87): Tercentenary Studies*, (Dordrecht, 1990), pp. 55 - 76.
- 'Medicine and Pneumatology: Henry More, Richard Baxter, and Francis Glisson's *Treatise on the Energetic Nature of Substance*', *Medical History*, 31 (1987), 15 - 40.
- '"Pray Do Not Ascribe That Notion to Me": God and Newton's Gravity', in James E. Force and Richard H. Popkin, eds., *The Books of Nature and Scripture: Recent Essays on natural Philosophy, Theology, and Biblical in the Netherlands of Spinoza's Time and the British Isles of Newton's Time* (Dordrecht/Boston/London, 1994), pp. 123 - 148.
- Herbert, G. B. *Thomas Hobbes: the Unity of Scientific and Moral Wisdom* (Vancouver, 1989).
- Heyd, Michael. 'Medical Discourse in religious Controversy: The Case of the Critique of "Enthusiasm" on the Eve of the Enlightenment', *Science in Context*, 8 (1995), 133 - 57.
- Hill, Christopher. *Change and Continuity in Seventeenth-Century England* (Cambridge, Mass., 1962).
- 'Scientists in Society', *New York Review of Books*, 25 (7 Dec. 1978), 37 - 9.
- 'Till the Conversion of the Jews', in, Richard H. Popkin, *Millenarianism and Messianism in English Literature and thought 1650-1800* (Leiden/New York/Copenhagen/Koln, 1988), pp. 12 - 36.
- Hirschberg, D. R. 'The Government and Church Patronage in England, 1660 - 1760', *Journal of British Studies*, 20 (1980), 109 - 39.
- Hiscock, W. G. ed., *David Gregory. Isaac Newton and their Circle. Extracts from David Gregory's Memoranda, 1677-1708.* (Oxford, 1937).
- John Evelyn and his Family Circle* (London, 1955).
- Hoffmann, Manfred. *Rhetoric and Theology: The Hermeneutic of Erasmus* (Toronto/London, 1994).
- Holmes, Geoffrey S. 'Science, Reason, and Religion in the Age of Newton', a review of *NER*, in, *BJHS*, 11 (1978), pp. 164 - 71.
- British Politics in the Age of Anne* (London, revised ed., 1987).
- Home, R. W. 'Out of the Newtonian Straightjacket: Alternative Approaches to Eighteenth-Century Physical Science', *Studies in the Eighteenth Century*, 4 (1979), 235 - 49.
- Hooykaas, R. *Religion and the Rise of Modern Science* (Edinburgh/London, 1972).
- Hoskin, M. A. "'Mining All Within": Clarke's Notes to Rohault's *Traite de physique*', *The Thomist*, 24 (1961), 353 - 63.
- 'Newton, Providence and the Universe of Stars', *J. Hist. Astron.*, 8 (1977), 77 - 101.
- Howell, Wilbur S. *Logic and Rhetoric in England, 1500 - 1700* (New Jersey, 1958), *Eighteenth Century British Logic and Rhetoric* (New Jersey, 1971).
- Hughes, A. 'Science in English Encyclopaedias, 1704-1875', *Annals of Science*, 7 (1951), 340 - 70; 8 (1952), 323 - 67.
- Hunt R. M. *The Place of Religion in the Science of Robert Boyle* (Pittsburgh, 1955).
- Hunter, Michael. *Science and Society in Restoration England* (Cambridge, 1981).
- 'The Problem of "Atheism" in Early Modern England', *Transactions of the Royal Historical Society*, 5th. series, 35 (1985), 135 - 57.
- The Royal Society and its Fellows 1660-1700: The Morphology of an Early Scientific Institution*, BSHS Monographs no. 4 (Oxford, 2nd. ed. 1994).
- 'Science and Heterodoxy: an Early Modern Problem Reconsidered', in Lindberg and Westman (eds.) *Reappraisals of the Scientific Revolution* (Cambridge, 1990).
- 'Alchemy, Magic, and Moralism in the Thought of Robert Boyle', *BJHS*, 23 (1990), 387 - 410.
- and David Wootton, eds., *Atheism from the Reformation to the Enlightenment* (Oxford, 1992).

- 'Casuistry in Action: Robert Boyle's Confessional Interviews with Gilbert Burnet and Edward Stillingfleet, 1691', *Journal of Ecclesiastical History* 44 (1993), 80 - 98.
- 'The Conscience of Robert Boyle: Functionalism, "Dysfunctionalism" and the Task of Historical Understanding', in, Field, J. V. and A. J. L. James, eds., *Renaissance and Revolution: Humanists, Scholars, Craftsmen, and Natural Philosophers in Early Modern Europe* (Cambridge, 1994), pp. 147 - 59.
- Robert Boyle by Himself and his Friends: with a Fragment of William Wotton's Life of Boyle* (London, 1994).
- Hunter, R. A. and Ida Macalpine. 'Valentine Greatrakes', *St. Bartholomew's Hospital Journal*, 60 (1956), 361 - 8.
- Hutin, Serge. *Henry More. Essai sur les doctrines theosophique chez les Platoniciens de Cambridge* (Hildesheim, 1966).
- Hutton, Sarah. *Of Mysticism and Mechanism: Tercentenary Studies of Henry More, 1614-1687* (Dordrecht, 1990).
- and John Henry, eds., *New Perspectives on Renaissance Thought: Essays in the History of Science, Education, and Philosophy: in Memory of Charles B. Schmitt* (London, 1990).
- 'Edward Stillingfleet, Henry More, and the Decline of Moses Atticus: A Note on Seventeenth-Century Apologetics', in W. R. F. Kroll, ed., *Philosophy, Science, and Religion in England 1640-1700* (Cambridge, 1992), 68 - 84.
- 'Science, Philosophy, and Atheism: Edward Stillingfleet's Defence of Religion' in, Richard H. Popkin and Arjo Vanderjagt eds., *Scepticism and Irreligion in the Seventeenth and Eighteenth Centuries* (Leiden/New York/Koln, 1993), pp. 102 - 20.
- Hutchison, Keith. 'Supernaturalism and the Mechanical Philosophy', *HS*, 21 (1983), 297 - 333.
- Iltis, Carolyn. 'The Leibnizian-Newtonian Debates: Natural Philosophy and Social Psychology', *BJHS*, 6 (1973), 343 - 377.
- Irwin, Raymond. *The Origins of the English Library* (London, 1958).
- Jacob, James R. *Robert Boyle and the English Revolution: A Study in Social and Intellectual Change* (New York, 1977).
- Henry Stubbe, Radical Protestantism and the Early Enlightenment* (Cambridge, 1983).
- and Margaret C. Jacob, 'The Anglican Origins of Modern Science: The Metaphysical Foundations of the Whig Constitution', *Isis*, 71 (1980), 251 - 67.
- Jacob, Margaret C. 'The Church and the Formulation of the Newtonian World-View', *Journal of European Studies*, 1 (1971), 128 - 48.
- The Newtonians and the English Revolution, 1689 - 1720* (New York, 1976).
- The Radical Enlightenment: Pantheists, Freemasons and Republicans* (London, 1981).
- The Cultural Meaning of the Scientific Revolution* (New York, 1988).
- 'Scientific Culture in the Early Enlightenment: Mechanisms, Industry, and Gentlemanly Facts', in, Alan Charles Kors and Paul J. Korshin, eds., *Anticipations of the Enlightenment in England, France, and Germany* (Philadelphia, 1987).
- 'Reflections on the Ideological Meanings of Western Science from Boyle and Newton to the Postmodernists', *HS*, 33 (1995), 333 - 57
- Jacob, W. M. and Nigel Yates eds. *Crown and Mitre: Religion and Society in Northern Europe Since the Reformation* (Woodbridge, 1993).
- Jebb, R. C. *Bentley* (London, 1902).
- Johns, Adrian. 'Natural Philosophy and the History of the Book', PhD. thesis (Cambridge, 1989).
- Jones, Clyve and Geoffrey Holmes, eds., *The London Diaries of William Nicolson, Bishop of Carlisle, 1702 - 1718* (Oxford, 1985).
- Jones, Howard. *The Epicurean Tradition* (London, 1989).

- Jones, J. R. *Country and Court: England, 1658 - 1714* (Cambridge, 1979).
- Jones, Richard F. *Ancient and Moderns: A Study of the Rise of the Scientific Movement in Seventeenth-Century England* (2nd. edn., St. Louis, 1961).
- Jones, William Powell. *The Rhetoric of Science: A Study of Scientific Ideas and Imagery in Eighteenth-Century Poetry* (London, 1966).
- Jordan, W. K. *The Charities of London, 1480 - 1660: the Aspirations and the Achievements of the Urban Society* (London, 1960).
- Joy, Lynn Sumida. *Gassendi the Atomist; Advocate of History in an Age of Science* (Cambridge, 1987).
- Kahn, Victoria. *Rhetoric, Prudence and Scepticism in the Renaissance* (Ithaca, 1985).
- Kammen, Michael, ed. *The Past Before Us: Contemporary Historical Writing in the United States* (Ithaca, 1980).
- Kaplan, Barbara Beigun. 'Greatrakes the Stroker: The Interpretations of his Contemporaries', *Isis* 73 (1982), 178 - 85.
- Kargon, Robert Hugh. 'Walter Charlton, Robert Boyle, and the Acceptance of Epicurean Atomism in England', *Isis*, 55 (1964), 184 - 192.
Atomism in England from Hariot to Newton (Oxford, 1966).
- Kearney, H. *Scholars and Gentlemen. Universities and Society in Pre-Industrial Britain 1500 - 1700* (London, 1970).
- Keeble, N. H. *The Literary Culture of Nonconformity in Later Seventeenth-Century England* (Leicester, 1987).
and Geoffrey Nuttall, eds., *Calendar of the Correspondence of Richard Baxter* (2 vols., Oxford, 1991).
- Kellaway, W. *The New England Company, 1649 - 1776* (London, 1961).
- Kemmler, Dieter Werner. *Faith and Human Reason: A Study of Paul's Method of Preaching as Illustrated by 1-2 Thessalonians and Acts 17, 2-4* (Leiden, 1975).
- Kempe, J. E. *The Classic Preachers of the English Church* (2 vols., London, 1877 - 78).
- Kenney, E. J. and W. V. Clausen, eds. *The Cambridge History of Classical Literature*. Vol. 2, Latin Literature (Cambridge, 1982).
- Kenyon, J. *Revolution Principles: The Politics of Party 1688 - 1720* (Cambridge, 1977).
- Kerby-Miller, Charles, ed. *The Memoirs of the Extraordinary Life, Works, and Discoveries of Martinus Scriblerius* (New York, 1966).
- King, P. 'Bishop Wren and the Suppression of the Norwich Lecturers' *Camb. Hist. Journal*, 11 (1968), 237 - 54.
- Kirk, Linda. *Richard Cumberland and Natural Law. Secularization of Thought in Seventeenth-Century England* (Cambridge, 1987).
- Klaaren E. M. *Religious Origins of Modern Science: Belief in Creation in Seventeenth-Century Thought* (Grand Rapids, 1977).
- Koppel, Richard M. 'English Satire on Science, 1660-1750', PhD thesis (Univ. of Rochester, 1978).
- Kors, Alan Charles. "'A First Being of Whom We Have No Proof". The Preamble of Athiesm in Early-Modern France', in Alan Kors and Paul J. Korshin, eds., *Anticipations of the Enlightenment in England, France, and Germany* (Philadelphia, 1987), pp. 17 - 68.
- Korshin, Paul, ed. *Studies in Change and Revolution: Aspects of English Intellectual History 1640-1800* (Menston, 1972).
- Koyré, Alexander and I. B. Cohn. 'The Case of the Missing Tanquam', *Isis* 52 (1961), 555 - 66.
- Kroll, R. W. F. et. al., eds. *Philosophy, Science, and Religion in England 1640-1700* (Cambridge, 1991).
The Material Word: Literate Culture in the Restoration and Early Eighteenth Century (Baltimore/London, 1991).
- Kubrin, D. 'Newton and the Cyclical Cosmos: Providence and the Mechanical Philosophy',

- J. Hist. Idea.*, 28 (1967), 325 - 46.
 'Providence and the Mechanical Philosophy: the Creation and Dissolution of the World in Newtonian Thought', PhD thesis (Cornell University 1968).
- Kuhn, Albert J. 'English Deism and the Development of Romantic Mythological Syncretism', *PMLA*, 71 (1956) 1094 - 1116.
 'Nature Spiritualised: Aspects of Anti-Newtonianism', *English Literary History*, 41 (1974), 400 - 12.
- LaCapra, Dominique. *Rethinking Intellectual History: Texts, Contexts, Language* (New York, 1983).
 and Steven Kaplan, eds., *Modern European Intellectual History: Reappraisals and New perspectives* (New York, 1982).
- Langford, Paul. *Public Life and Propertied Englishmen, 1689 - 1798* (Oxford, 1990).
- Lanham, Richard A. *A Handlist of Rhetorical Terms: A Guide for Students of English literature* (2nd. ed., Berkeley/ Los Angeles/Oxford, 1991).
- Latour, Bruno. *Science in Action* (Cambridge, Mass., 1987).
- Lawn, Brian. *The Rise and Decline of the Scholastic 'Quaestio Disputata': with a Special Emphasis on its Use in the Teaching of Medicine and Science* (Leiden, 1993).
- Leites, Edmund, ed. *Conscience and Casuistry in Early Modern Europe* (Cambridge, 1988).
- Lemay, J. A. Leo, ed., *Deism, Masonry, and the Enlightenment* (Delaware, 1987).
- Lennox, James G. 'Robert Boyle's Defence of Teleological Inference in Experimental Science', *Isis* 74 (1983), 38 - 52.
- Le Rossignol, James Edward. *The Ethical Philosophy of Samuel Clarke* (Leipzig, 1892).
- Leslie, Michael and Timothy Raylor, eds. *Culture and Cultivation in Early Modern England: Writing and the Land* (Leicester/London, 1992).
- Lessenich, Rolf P. *Elements of Pulpit Oratory in Eighteenth-Century England, 1660-1800* (Cologne, 1972).
- Levine, Joseph M. *Dr. Woodward's Shield Shield: History, Science, and Satire in Augustan England* (Berkeley/Los Angeles/London, 1977).
Humanism and History (New York/London, 1987).
The Battle of the Books: History and Literature in the Augustan Age (Cornell, 1991).
 'Bentley's Milton: Philosophy and Criticism in Eighteenth-Century England', *J. Hist. Ideas*, 50 (1989), 549 - 68.
- Lillywhite, Bryant *London Coffee-houses: A Reference Book of Coffee-houses of the Seventeenth, Eighteenth and Nineteenth Centuries* (London, 1963).
- Lindberg, David C. and Ronald L. Numbers, eds., *God and Nature: Historical Essays on the Encounter Between Christianity and Science* (Berkeley, 1986).
- Lindberg, David C. and Robert S. Westman, eds., *Reappraisals of the Scientific Revolution* (Cambridge, 1990).
- Lund, Roger D. *The Margins of Orthodoxy: Heterodox Writing and Cultural Response, 1660 - 1750* (Cambridge, 1995).
- McAdoo, H. R. *The Structure of Caroline Moral Theology* (London, 1949).
The Spirit of Anglicanism: A Survey of Anglican Theological Method in the Seventeenth Century (London, 1965).
- McDonald, Mary Francis, trans. *Lactantius The Divine Institutes Books i - vii* (Washington, 1964).
- McEvoy, John. 'Matter and Spirit in Eighteenth-Century British Natural Philosophy', *BJHS*, 15 (1982), 99 - 131.
- McGuire, J. E. and P. M. Rattansi. 'Newton and the "Pipes of pan"', *NRRS*, 21 (1966), 108 - 43.
 'Force Active Principles and Newton's Invisible Realm', *Ambix* 15 (1968) 154-208.
 'Boyle's Conception of Nature', *J. Hist. Ideas*. 33 (1972), 523 - 542.
 'Newton on Place . Time, and God: An Unpublished Source', *BJHS*, 11 (1978), 114 -

29.
 and Martin Tamney. *Certain Philosophical Questions: Newton's Trinity Notebook* (Cambridge, 1983).
- and Trevor Melia, 'Some Cautionary Strictures on the Writing of the Rhetoric of Science', *Rhetorica*, 7 (1989), 87 - 99.
- 'Predicates of Pure Existence: Newton on God's Space and Time', in Philip Bricken and R. I. G. Hughes, eds., *Philosophical Perspectives on Newtonian Science* (Cambridge, Mass./London, 1990).
- Mckenzie, D. F. 'Richard Bentley's Design for the Cambridge University Press', *Transactions of the Cambridge Bibliographical Society*, 6 (1976), 322 - 7.
- Mckee, Richard. 'The Battle of the Books', in Wayne C. Booth ed., *The Knowledge Most Worth Having* (Chicago, 1967), pp. 173 - 202.
- McKie, Douglas. 'John Harris and his Lexicon Technicum', *Endeavour*, 4 (1945), 53 - 7.
- McKitterick, D. *Cambridge University Library. A History* (2 vols., Cambridge, 1986).
- McLachlan, Herbert. *The Religious Opinions of Milton, Locke and Newton* (Manchester, 1941).
- Socinianism in Seventeenth-Century England* (London, 1951).
- Macdonald, Michael. *Sleepless Souls: Suicide in Early Modern England* (Oxford, 1990).
- MacIntyre, Alisdair and Paul Ricœur. *The Religious Significance of Atheism* (New York/London, 1969).
- Macpherson, C. B. *The Political Theory of Possessive Individualism: Hobbes to Locke* (Oxford, 1962).
- Madison, R. E. W. *The Life of the Honourable Robert Boyle, F. R. S.* (London, 1969).
- Mallet, Charles Edward. *A History of the University of Oxford* (2 vols., London, 1924).
- Mandlebrote, Scott. "'A duty of the greatest moment": Isaac Newton and the Writing of Biblical Criticism', *BHHS*, 26 (1993), 281 - 302.
- Manuel, Frank. *Isaac Newton Historian* (Cambridge, Mass., 1963).
- A Portrait of Isaac Newton* (Cambridge, Mass., 1968).
- The Religion of Isaac Newton* (Oxford, 1974).
- Markley, Robert. *Fallen Languages: Crises of Representation in Newtonian England, 1660 - 1740* (Ithaca/London, 1993).
- 'Objectivity as Ideology: Boyle, Newton, and the Language of Science', *Genre*, 14 (Winter, 1983), 355 - 72.
- Marshall, John. 'The Ecclesiology of the Latitude-Men 1660-1689: Stillingfleet, Tillotson, and "Hobbism"', *Journal of Ecclesiastical History*, 36 (1985), 407 - 27.
- Matar, Nabil I. 'The Idea of the Restoration of the Jews in English Protestant Thought: 166-1701', *Harvard Theological Review*, 78 (1985), 115 - 48.
- 'John Locke and the Jews', *Journal of Ecclesiastical History*, 44 (1993), 45 - 62.
- Mayo, T. F. *Epicurus in England* (Dallas, 1934).
- Meinel, Christoph. 'Early Seventeenth-Century Atomism. Theory, Epistemology, and the Insufficiency of Experiment', *Isis*, 79 (1988) 68-103.
- Mendelson, Sara Heller. *The Mental World of Stuart Women: Three Studies* (Brighton, 1987).
- Mendyk, A. E. 'Speculum Britanniae.' *Regional Study, Antiquarianism, and Science in Britain to 1700* (Toronto, 1989).
- Merton, Robert K. *Science, Technology and Society in Seventeenth-Century England* (New York, 1970).
- Metzger, Helene. *Attraction universelle et religion naturelle chez quelques commentateurs anglais de Newton* (Paris, 1938).
- Miles, Roger B. *Science, Religion, and Belief: the Clerical Virtuosi of the Royal Society of London 1663-1687* (New York, 1992).
- Mintz, Samuel I. *The Hunting of Leviathan: Seventeenth-Century Reactions to the Materialism and Moral Theory of Thomas Hobbes* (Cambridge, 1962).

- Mitchell, W. Fraser. *English Pulpit Oratory from Andrews to Tillotson: A Study of its Literary Aspects* (London/New York/Toronto, 1932).
- Monk, J. H. James Henry Monk, *The Life of Richard Bentley, D. D. Master of Trinity College, and Regius Professor of Divinity in the University of Cambridge: With an Account of His Writings, and Anecdotes of Many Distinguished Characters During the Period in Which He Flourished* (2 vols., London, 1833).
- Moran, Bruce T. *Patronage and Institutions: Science, Technology, and Medicine at the European Court, 1500 - 1750* (Woodbridge, 1991).
- More, Louis Trenchard. *The Life and Works of the Honourable Robert Boyle* (Oxford, 1944).
- More, Paul Elmer and Frank Leslie Cross, eds. *Anglicanism: The Thought and Practice of the Church of England, Illustrated from the Religious Literature of the Seventeenth Century* (London, 1957).
- Morgan, John. *Godly Learning - Puritan Attitudes Towards Reason, Learning and Education, 1540 - 1640* (Cambridge, 1986).
- Mulligan, Lotte. 'Civil War Politics, Religion and the Royal Society', *Past and Present*, 59 (1973), 92 - 116.
'Robert Boyle, "Right Reason", and the Meaning of Metaphor', *J. Hist. Ideas*, 55 (1994), 235 - 57.
- Munz, Peter. 'The Rhetoric of Rhetoric', *J. Hist. Ideas*, 51 (1990), 121 - 59.
- Murphy, James. *Rhetoric in the Middle Ages: A History of Rhetorical Theory from St. Augustine to the Renaissance* (Berkeley, 1974).
- Newton, Isaac. *The Correspondence of Isaac Newton*, eds., H. W. Turnbull, J. F. Scott, A. R. Hall and Laura Tilling (7 vols., Cambridge, 1959 - 77).
- Nelson, Benjamin. ' "Probabilists", "Antiprobabilists" and the Quest for Certitude in the Sixteenth and Seventeenth Centuries', *Actes du XC Congres Internationale d'Histoire des Sciences*, Proceedings, 1 (1965).
- Nelson, Thomas, Allan McGill and Donald McCloskey, eds. *The Rhetoric of the Human Sciences: Language and Argument in Scholarship and Public Affairs* (Madison, 1987).
- Nicolson, Marjorie Hopc, ed., *The Conway Letters: The Correspondence of Anne, Viscountess Conway, Henry More, and their Friends 1642 - 1684*. Revised Edition with an Introduction and New Material Edited by Sarah Hutton (Oxford, 1992).
- Nye, Mary Jo, Joan L. Richards and Roger H. Steuwer, eds. *The Invention of Physical Science: Intersections of Mathematics, Theology, and Natural Philosophy since the Seventeenth Century* (Boston, 1992).
- Oakley, Francis. *Omnipotence, Covenant, and Order* (Ithaca, 1984).
'Christian Theology and Newtonian Science: The Rise of the concept of Laws of Nature', *Church History*, 30 (1961), 433 - 57.
- O'Day, R. 'Anatomy of a Profession: the Clergy of the Church of England' in W. Prest, ed., *The Professions in Early Modern England* (London, 1987), pp.
- Ogilvie, R. M. *Latin and Greek. A History of the Influence of the Classics on English Life from 1600 to 1918* (London, 1964).
- Olson, Richard. 'On the Nature of God's Existence, Wisdom and Power: the Interplay Between Organic and Mechanistic Imagery in Anglican Natural Theology 1640-1740', in Frederick Burwick, ed., *Approaches to Organic Form* (Dordrecht, 1987), pp. 1 - 48.
'Tory-High Church Opposition to Science and Scientism in the Eighteenth Century: the Works of John Arbuthnot, Jonathan Swift, and Samuel Johnson', in John G. Burke, ed., *The Uses of Science in the Age of Newton* (California, 1983), pp. 171 - 204;
- Ong, Walter. *Ramus. Method, and the Decay of Dialogue* (Cambridge/Mass., 1958).
- Osler, M. J., ed. *Atoms, Pneuma and Tranquillity: Epicurean and Stoic Themes in European Thought* (Cambridge, 1992).

- and Paul Lawrence Farber, eds., *Religion, Science, and World View Essays in Honour of Richard Westfall* (Cambridge, 1985).
- Oster, Malcolm. 'Nature, Ethics and Divinity: the Early Thought of Robert Boyle', D.Phil. thesis (University of Oxford, 1990).
- Malcolm Oster, 'Biography, Culture and Science: the Formative Years of Robert Boyle', *HS*, 31 (1993), 177 - 226.
- Overton, J. H. *Life in the English Church, 1660-1714* (London, 1885).
- The Non-Jurors: Their Lives, Principles and Writings* (London, 1902).
- Owen, David. *English Philanthropy: 1660-1960* (Cambridge, 1965).
- Pagden, Anthony. *European Encounters with the New World* (New Haven/London, 1993).
- Pailin, David, A. *Attitudes to Other Religions: Comparative Religion in Seventeenth-and Eighteenth-Century Britain* (Manchester, 1984).
- Palter, Robert. 'Saving Newton's Text: Documents, Readers, and the Ways of the World', *Studies in the History and Philosophy of Science*, 18 (1987), 385 - 439.
- Paradis, James. 'Montaigne, Boyle, and the Essays of Experience', in, George Levine, ed., *One Culture* (Madison, 1987), pp. 59 - 91
- Parker, T. M. 'The Rediscovery of the Fathers in the Seventeenth-Century Anglican Tradition', in J. Coulson and a. M. Allchin, eds., *The Rediscovery of Newman* (London, 1967).
- Parry, Graham. 'John Evelyn as Hortulan Saint', in Michael Leslie and Timothy Raylor, eds., *Culture and Cultivation in Early Modern England: Writing and the Land* (Leicester/London, 1992).
- The Trophies of Time: English Antiquarians of the Seventeenth Century* (Oxford, 1995).
- Patey, Douglas Lanc. *Probability and Literary Form: Philosophic Idea and Literary Practice in the Augustan Age* (Cambridge/New York, 1984).
- Perl, Margula R. 'Physics and Metaphysics in Newton, Leibniz, and Clarke', *J. Hist. Ideas*, 30 (1969), 507 - 26.
- Phiddian, Robert. *Swift's Parody* (Cambridge, 1995).
- Philipp, Wolfgang. 'Physicothology in the Age of Enlightenment: Appearance and History', *Studies on Voltaire and the Eighteenth Century*, 57 (1967), 1233 - 67.
- Popkin, R. H. 'The Religious Background to Seventeenth-Century Philosophy', *Journal of the History of Philosophy*, 25 (1987), 35 - 50.
- 'The Crisis of Polytheism and the Answers of Vossius, Cudworth, and Newton', in, James E. Force and Richard H. Popkin, eds., *Essays on the Context, Nature, and Influence of Isaac Newton's Theology* (Dordrecht/Boston/London, 1990), pp. 9 - 42.
- and Arjo Vanderjagt eds., *Scepticism and Irreligion in the Seventeenth and Eighteenth Centuries* (Leiden/New York/Koln, 1993).
- Porter, Roy. Review of *NLR*, *Social History*, 3 (1978), 246 - 49.
- and Mikulas Teiche, eds., *The Scientific Revolution in National Context* (Cambridge, 1992).
- Prelli, Lawrence J. *A Rhetoric of Science: Inventing Scientific Discourse* (South Carolina, 1989).
- Prickett, Stephen. *Words and the Word: Language, Poetics and Biblical Interpretation* (Cambridge, 1986).
- Principe Lawrence M. 'Style and Thought of the Early Boyle: Discovery of the 1648 Manuscript of Seraphic Love' *Isis*, 85 (1994), 249 - 60.
- Rackham, H. *De Natura Deorum, with an English Translation* (London, 1933).
- Redwood, John. *Reason, Ridicule and Religion: The Age of Enlightenment in England 1660-1750* (London, 1976).
- Reedy, Gerard. *The Bible and Reason* (Philadelphia, 1975).
- Robert South (1634 - 1716): An Introduction to his Life and Sermons* (Cambridge, 1992).

- 'Interpretating Tillotson', *Harvard Theological Review*, 86, (1993), 81 - 103.
- Reventlow, Henning Graf. *The Authority of the Bible and the Rise of the Modern World*. Trans., John Bowden (London, 1984).
- Rex, Walter. *Essays on Pierre Bayle and Religious Controversy* (The Hague, 1965).
- Reynolds, L. D. and N. G. Wilson, eds. *Scribes and Scholars: A Guide to the Transmission of Greek and Latin literature* (Oxford, 1991).
- Richards, I. A. *The Philosophy of Rhetoric* (Oxford, 1965).
- Richardson, C. F. *English Preachers and Preaching* (London, 1928).
- Rigaud, S. J. *Correspondence of Scientific Men of the Seventeenth Century* (2 vols., Oxford, 1841).
- Rivers, Isabel, ed. *Books and their Readers in Eighteenth-Century England* (Leicester, 1982).
- Reason Grace and Sentiment: A Study of the Language of Religion and Ethics in England, 1660 - 1780* (Cambridge, 1991).
- Robbins, Keith, ed. *Religion and Humanism* (Oxford, 1981).
- Roberts, R. H. and J. M. M. Good. *The Recovery of Rhetoric: Persuasive Discourse and Disciplinarity in the Human Sciences* (London, 1993).
- Robinson, A. E., ed. 'The Life of Richard Kidder D. D. Bishop of Bath and Wells Written by Himself', *Somerset Record Society*, 37 (1922).
- Rogers, G. A. C. 'Locke's Essay and Newton's Principia', *J. Hist. Ideas*, 39 (1978), 217 - 32.
- 'The Basis of Belief: Philosophy, Science, And Religion in Seventeenth-Century England', *History of European Ideas*, 6 (1985), 19 - 30.
- Rosa, Susan. 'Ralph Cudworth in the *Republique des Lettres*: the Controversy about *Plastic Nature* and the Reputation of Pierre Bayle', in *Studies in Eighteenth Century Culture*, 23 (1994), 147 - 60.
- Rose, Craig 'Providence, Protestant Union and Godly Reformation in the 1690s', *Royal Historical Society Transactions*, Sixth Series, 3 (London, 1993), pp. 151 - 169.
- Rostvig, Maria-Sophie. *The Happy Man. Studies in the Metamorphoses of a Classical Ideal* (vol. i, Oslo/Oxford, 1958).
- Rudwick, Martin. 'Senses of the Natural World and Senses of God: Another Look at the Historical Relation of Science and Religion', in A. R. Peacocke, ed., *The Sciences and Theology in the Twentieth Century* (Indiana, 1981), pp. 241 - 61.
- Ruestow, Edward G. 'Piety and the Defence of Order: Swammerdam on Generation', in Osler and Faber eds. (1985), pp. 217 - 41.
- Russell, C. A. *Science and Social Change 1700 - 1900* (Hong Kong, 1983).
- Russell, R. J., William R. Stoegger and George V. Coyne, eds. *Physics, Philosophy and Theology: A Common Quest for Understanding* (Vatican City/Indiana, 1988).
- Sailor, Danton B. 'Newton's Debt to Cudworth', *J. Hist. Ideas*, 49 (1988), 511 - 18.
- Sandys, John Edwin. *A History of Classical Scholarship* (3 vols., New York, 1958).
- Sarashon, L. T. 'Nicholas Claude Fabri de Peiresc and the Patronage of the New Science in the Seventeenth Century', *Isis*, 84 (1993), pp. 70 - 90.
- Sargent, Rose-Mary. 'Scientific Experiment and Legal Expertise: The Way of Experience in Seventeenth-Century England', *Studies in the History and Philosophy of Science*, 20 (1989), 19 - 45.
- The Diffident Naturalist: Robert Boyle and the Philosophy of Experience* (Chicago, 1995).
- Schaffer, Simon. 'Halley's Atheism and the end of The World', *NRRS*, vol. 32 (9177), 17 - 40.
- 'Newtonian Cosmology and the Steady State', PhD thesis (University of Cambridge, 1980).
- 'Natural Philosophy and Public Spectacle in the Eighteenth Century', *HS*, 21 (1983), 1 - 43.

- 'Self Evidence', *Critical Inquiry*, 18 (1992), 327 - 62,
- Scheurer, P. B. and G. Debrock, eds. *Newton's Scientific and Philosophical Legacy* (Dordrecht, 1988).
- Schierbeck, Abraham. *Jan Swammerdam (1633 - 1680). His Life and Works* (Amsterdam, 1967).
- Schlatter, Richard. *The Social Ideas of Religious Leaders, 1660 - 1688* (Oxford, 1940).
- Schmitt, Charles B. *Aristotle and the Renaissance* (Cambridge, Mass., 1983).
The Aristotelian Tradition and Renaissance Universities (London, 1984).
- Schofield, Robert E. *Mechanism and Materialism: British Natural Philosophy in an Age of Reason* (New Jersey, 1970).
- Schuster, John and Richard Yco, eds. *The Politics and Rhetoric of Scientific Method: Historical Studies* (Dordrecht, 1986).
 'Descartes' *Mathesis Universalis*: 1619 - 28', in Stephen Gaukroger, ed., *Descartes: Philosophy, Mathematics and Physics* (Sussex, 1980), pp. 41 - 96.
- Schwartz, Hillel. *Knives, Fools, Madmen and that Subtle Effluvia: A Study of the Opposition to the French prophets in England 1706 - 1710* (Gainesville, 1978).
The French prophets: The History of a Millenarian Group in Eighteenth-Century England (Berkeley/London, 1980).
- Seigel, Jerrold E. *Rhetoric and Philosophy in Renaissance Humanism: The Union of Eloquence and Wisdom, Petrarch to Valla* (Princeton, 1968).
- Sell, Alan P. F. 'Samuel Clarke on the Existence of God', *Enlightenment and Dissent*, 3 (1984), 65 - 76.
- Seznec, Jean. *The Survival of the Pagan Gods* (Princeton, 1953).
- Shanahan, Timothy. 'God and Nature in the Thought of Robert Boyle', *Journal of the History of Philosophy* 26 (1988), 547 - 69.
- Shapin, Steven. 'Social uses of Science', in G. S. Rousseau and Roy Porter eds., *The Ferment of Knowledge: Studies in the Historiography of Eighteenth-Century Science* (Cambridge, 1980), pp. 93 - 139.
 and Simon Schaffer. *Leviathan and the Air Pump: Hobbes, Boyle, and the Experimental Life* (Princeton, 1985).
 "'A Scholar and a Gentleman": The Problematic Identity of the Scientific Practitioner in Early Modern England', *HS*, 29 (1991), 279 - 327).
 'Personal Development and Intellectual Biography: the Case of Robert Boyle', *BJHS*, 26 (1993), 335 - 45.
A Social History of Truth: Civility and Science in Seventeenth-Century England (Chicago/London, 1994).
- Shapiro, Barbara J. 'Latitudinarianism and Science in Seventeenth Century England', *Past and Present*, 40 (1968), 16 - 41.
Probability and Certainty in Seventeenth-Century England (New Jersey, 1983).
- Shapiro, A. E. *Fits, Passions and Paroxysms: Physics, Method, and Chemistry and Newton's Theories of Coloured bodies and Fits of Easy Reflection* (Cambridge, 1993).
- Simon, Irène. *Three Restoration Divines: Barrow, South, Tillotson* (Paris, 2 vols., 1967 & 1976).
 'The Preacher', in Mordechai Feingold, ed., *Before Newton: The Life and Times of Isaac Barrow* (Cambridge, 1990), pp. 303 - 32.
- Simons, Herbert, ed. *The Rhetorical Turn: Invention and Persuasion in the Conduct of Inquiry* (Chicago, 1990).
- Skinner, Quentin. *Reason and Rhetoric in the Philosophy of Hobbes* (Cambridge, 1996).
- Slaughter, M. M. *Universal Languages and Scientific Taxonomy in the Seventeenth Century* (Cambridge, 1982).
- Slights, Camille. 'Ingenuous Picty: Anglican Casuistry of the Seventeenth Century', *Harvard Theological Review*, 63 (1970), 409 - 32.

- Smart, Ninian. 'Understanding Religious Experience', in Steven T. Katz, ed., *Mysticism and Philosophical Analysis* (London, 1978), pp. 10 - 24.
- Smith, H. Maynard. 'The Early Life and Education of John Evelyn', in *Oxford Historical and Literary Studies*, 11 (Oxford, 1920).
- Smith, Nigel. *Perfection Proclaimed: Language and Literature in English Radical Thought 1640-1660* (Oxford, 1989).
- Snider, Alvin. *Origin and Authority in Seventeenth-Century England: Bacon, Milton, and Butler* (Toronto/Buffalo/London, 1994).
- Sonnino, Lee A. *A Handbook to Sixteenth-Century Rhetoric* (London, 1968).
- Sorrell, Tom, ed. *The Rise of Modern Philosophy: The Tension between the New and Traditional Philosophies from Machiavelli to Leibniz* (Oxford, 1993).
- Spellman, W. M. *John Locke and the Problem of Depravity* (Oxford, 1988).
The Latitudinarians and the Church of England, 1660-1700 (Georgia/London, 1993).
- Spiller, Michael R. G. "Concerning Natural Experimental Philosophie": Meric Casaubon and the Royal Society (The Hague, 1980).
- Spingarn, J. E., ed. *Critical Essays of the Seventeenth Century* (3 vols., Oxford, 1957).
- Spink, J. S. *French Free-Thought from Gassendi to Voltaire* (London, 1960)
- Spurr, John. ' "Latitudinarianism" and the Restoration Church', *History Journal*, 31 (1988), 61 - 82.
' "Rational Religion" in Restoration England, *J. Hist. Ideas*, 49 (1988), pp. 563 - 85.
'The Church of England, Comprehension and the Toleration Act of 1689' *English Historical Review*, 104 (1989), pp. 927 - 46.
'Schism and the Restoration Church', *Journal of Ecclesiastical History*, 41 (1990), 408 - 24.
'"Virtue, Religion, and Government": The Anglican Uses of Providence', in T. Harris, P. Seaward and M. Goldie, eds., *The Politics of Religion in Restoration England* (Oxford, 1990), pp. 29 - 48.
The Restoration Church of England, 1646 - 1689 (New Haven/London, 1991).
- Stewart, Larry. 'Samuel Clarke, Newtonianism and the Factions of Post-Revolutionary England', *J. Hist. Ideas.*, 42 (1981) 53-72.
The Rise of Public Science: Rhetoric, Technology, and Natural Philosophy in Newtonian Britain, 1660 - 1750 (Cambridge, 1992).
- Stimson, Dorothy. 'Puritanism and the New Philosophy in Seventeenth-Century England', *Bulletin of the Institute of the History of Medicine*, 3 (1935), 321 - 34.
Scientists and Amateurs: A History of the Royal Society (London, 1949).
- Stones, G. B. 'The Atomic View of Matter in the XVth, XVIth, and XVIIth Centuries', *Isis*, 10 (1928), 445 - 65.
- Stranks, C. J. *Anglican Devotion* (London, 1951).
The Life and Writings of Jeremy Taylor (London, 1952).
- Streuver, Nancy S. *The Language of History in the Renaissance* (Princeton, 1970).
- Stromberg, R. N. *Religious Liberalism in Eighteenth-Century England* (London, 1954).
- Strong, E. W. 'Newtonian Explications of Natural Philosophy', *J. Hist. Ideas.*, 18 (1957), 49 - 83.
- Sullivan, Robert E. *John Toland and the Deist controversy: A Study in Adaptions* (Cambridge, Mass./London, 1982).
- Swedenborg, H. T. Jr. *England in the Restoration and the Early Eighteenth Century: Essays on culture and Society* (Berkeley, 1972).
- Sykes, Norman. *Church and State in England in the Eighteenth Century* (Cambridge, 1934).
From Sheldon to Secker (Cambridge, 1959).
and J. Booty, eds., *The Study of Anglicanism* (London, 1988).
- Tanner, J. R., ed. *The Private Correspondence and Miscellaneous Papers of Samuel Pepys 1679 - 1703: In the Possession of J. Pepys Cockerell* (2vols., London, 1926).

- Taylor, E. G. R. *The Mathematical Practitioners of Tudor and Stuart England* (Cambridge, 1954).
The Mathematical Practitioners of Hanoverian England (Cambridge, 1966).
- Thackray, Arnold. "The Business of Experimental Philosophy": The Early Newtonian Groups at the Royal Society', *Actes du XIIe longres International d'Histoire des Sciences*, 1 (1970-1) 3B: pp. 155-59.
- Thomas, Keith. *Religion and the Decline of Magic* (London, 1973).
- Thorndyke, Lynn. *A History of Magic and Experimental Science: Volumes vii and viii The Seventeenth Century* (2 vols., New York, 1958).
- Thrower, Norman J. W. *Standing on the Shoulders of Giants* (Berkeley, 1990), esp., B. J. Teeter-Dobbs, 'Newton as Alchemist and Theologian.'
- Tinkler, John F. 'The Splitting of Humanism: Bentley, Swift and the English Battle of the Books', *J. Hist. Ideas*, 49 (1988), 453 - 72.
- Todd, Margo. *Christian Humanism and the Puritan Social Order* (Cambridge, 1987).
- Topham, Jonathan. 'Science and popular Education in the 1830s: the Role of the Bridgewater Treatises', *BJHS*, 25 (1992), 397 - 430.
- Trompf, Gary W. 'On Newtonian History', in Gaukroger (1991), pp. 213 - 49.
- Trowbridge, Hoyt. 'Scattered Atoms of Probability', *Eighteenth Century Studies*, 5 (1971), 1 - 38.
- Tumbleson, Raymond D. "Reason and Religion": The Science of Anglicanism', *J. Hist. Ideas*, 57 (1996), 131 - 56.
- Vailati, Ezio. 'Leibniz and Clarke on Miracles', *J. Hist. Ideas*, 33 (1995), 363 - 91.
- van Leeuwen, Henry. *The Problem of Certainty in English Thought 1630 - 1690* (The Hague, 1963).
- Vickers, Brian. *Public and Private Life in the Seventeenth Century: the Mackenzie-Evelyn Debate* (New York, 1986).
Rhetoric and the Pursuit of Truth: Language Change in the Seventeenth and Eighteenth Centuries (Los Angeles, 1985).
In Defence of Rhetoric (Oxford, 1988).
- Viner, Jacob. *The Role of Providence in the Social Order: An Essay in Intellectual History* (Philadelphia, 1972).
- Wagar, W. W., ed., *The Secular Mind* (New York, 1982).
- Wakefield, G. S. *Puritan Devotion* (London, 1957).
- Waldman, Theodore. 'Origins of the Legal Doctrine of Reasonable Doubt', *J. Hist. Ideas*, 20 (1959), 299 - 316.
- Walmsley, Peter. 'Dispute and Conversation: Probability and the Rhetoric of Natural Philosophy in Locke's *Essay*', *J. Hist. Ideas* (1993).
- Wallace, D. D. *Puritans and Predestination - Grace in English Protestant Theology 1525 - 1695* (Chapel Hill, 1982).
- Wallace, William A. 'Newton's Early Writings: Beginnings of a New Direction', in G. V. Coyne, S. J., M. L. Heller and Z Zycinski, eds., *Newton and the New Direction in Science* (Vatican City, 1988), pp. 23 - 44.
- Watkins, Owen C. *The Puritan Experience* (London, 1972).
- Watson, Richard. *The Downfall of Cartesianism, 1673-1712* (The Hague, 1966).
- Webb, C. C. J. *Studies in the History of Natural Theology* (Oxford, 1915).
- Weber, Max. *The Protestant Ethic and the Spirit of Capitalism*. Trans. Talcott Parsons (London, 1930).
- Webster, Charles. *Samuel Hartlib and the Advancement of Learning* (Cambridge, 1970).
The Great Instauration: Science, Medicine, and Reform 1626 - 1660 (London, 1975).
- Weiss, Roberto. *The Renaissance Discovery of Classical Antiquity* (Oxford, 1969).
- Westfall, R. S. *Science and Religion in Seventeenth-Century England* (Ann Arbor, 1973).
Never at Rest: A Biography of Isaac Newton (Cambridge, 1980).
'Newton's Theological Manuscripts', in, Z. Bechler, ed., *Contemporary*

- Newtonian Research* (Dordrecht, 1982), pp. 29 - 143.
- White, R. J. *Dr. Bentley: A Study in Academic Scarlet* (London, 1965).
- Wilde, Chris. 'Hutchinsonianism. Natural Philosophy and Religious Controversy in Eighteenth-Century Britain', *HS*, 18 (1980), 1 - 24.
- Wilson, Catherine. 'Visual Surface and Visual Symbol: The Microscope and the Occult in Early Modern Science', *J. Hist. Ideas*, 49 (1988), 85 - 108.
- The Invisible world: Early Modern philosophy and the Invention of the Microscope* (New Jersey, 1995).
- Wilson, J. H. *The Court Wits* (Princeton, 1948).
- Winship, Michael P. *Seers of God: Puritan Providentialism in the Restoration and Early Enlightenment* (Baltimore, 1996).
- Wojcik, Jan W. 'Robert Boyle and the Limits of Reason: A Study of the Relation Between Science and Religion in Seventeenth-Century England', PhD thesis (Kentucky, 1992).
- Wood, Paul. 'Methodology and Apologetics: Thomas Sprat's *History of the Royal Society*', *BJHS*, 13 (1980), 1 - 26.
- Wood Thomas. *English Casuistical Divinity in the Seventeenth Century* (London, 1952).
- Woodhead, J. R. *The Rulers of London, 1660-1689: A Biographical Record of the Aldermen and Common Councilmen of the City of London* (London, 1965).
- Wordsworth, Christopher. *The Correspondence of Richard Bentley D. D. Master of Trinity College* (2 vols., Cambridge, 1848).
- Yeo Richard. 'Ephraim Chambers's *Cyclopaedia* (1728) and the Tradition of Commonplaces', *J. Hist. Ideas.*, 57 (1996), 157 - 75.
- Yolton, J. W. *Thinking Matter: Materialism in Eighteenth-Century Britain* (Oxford, 1983).
- John W. Yolton, 'On Being present to the Mind: A Sketch for the History of an Idea', *Dialogue*, 14 (1975), 373 - 88.
- Yoshimoto, H. 'Science and Religion in the Thought of Robert Boyle', *Kagakusi Kenkyu* 23 (1984), 193 - 200.
- Yung, Sik Kim. 'Another Look at Boyle's Acceptance of the Mechanical philosophy: its Limits and its Chemical and Social Context', *Ambix*, 38 (1991), 1 - 10.
- Young, B. W. "'Orthodoxy assailed": An Historical Examination of Some Metaphysical and Theological Debates In England From Locke to Burke', DPhil. diss. (Oxford, 1990).
- Zagorin, Peres. *Culture and Politics from Puritanism to the Enlightenment* (Berkeley/London, 1980).
- Zeitz, Lisa M. 'Natural Theology, Rhetoric, and Revolution: John Ray's Wisdom of God 1691 - 1704', *Eighteenth Century Life*, 18 (1994), 120 - 33.