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Ideas, Relations, and Signs: ‘Intuition’ and ‘Symbolic Substitution’ in Berkeley’s Theory of Knowledge of Nature

A thesis submitted to the faculty of Trinity College Dublin in fulfilment of the requirements for the degree of Doctor of Philosophy in the Department of Philosophy.

2014
Yasuaki Nakano
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Sumio Nakagawa,
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Summary

The chief aim of this thesis is to develop an interpretation of Berkeley's theory of knowledge of nature through clarification of two prominent motifs which underlie it, 'intuition' and 'symbolic substitution'. I regard these motifs as respectively characterizing two distinguishable stages of his thought about knowledge of nature. The 'intuition' motif is developed in the early period in his project of rebutting scepticism, conceiving knowledge of nature in terms of knowledge of 'ideas'. The motif of 'symbolic substitution' is only nascent in the early period and is fully developed through the middle to the late period. The latter motif grew out of Berkeley's attempt to account for general knowledge of nature, and conceives knowledge of nature in terms of knowledge of 'the laws of nature'. According to Berkeley's view in the middle-period works, scientific knowledge of nature is 'knowledge of relations' by symbolic representation. My discussion will be conducted in the following order.

In chapter 1, I start by distinguishing two basic strata which constitutes Berkeley's natural world, 'ideas' and 'the laws of nature'. Two types of knowledge are formulated which corresponds to these two strata of nature, 'intuitive' and 'predictive', and the structure and nature of each type of knowledge are discussed. Then I address myself to the question about the status of 'knowledge of relations' which Berkeley introduced in the second edition of the Principles. I will suggest that the significance of this new category of the object of human knowledge lies in its close link with the development of Berkeley's theory of 'the laws of nature'. This suggestion will be clarified through critical examination of Luce's and Johnston's interpretation.

In chapter 2, I discuss the intuitionist motif in Berkeley's early theory of knowledge. I highlight his intuitionist ideal of knowledge which is conspicuous in his response to scepticism, and argue that Berkeley's intuitionism in the early philosophical works, the Principles and Three Dialogues, follows the pattern of Cartesian epistemology which aims to attain 'absolute certainty' in knowledge. But it will be observed that Berkeley's intuitionist response to scepticism is problematic since it does not take 'the laws of nature' into consideration. It will be pointed out that, though he could defend knowledge-claim about laws of nature by appeal to 'moral certainty', he generally tends to keep knowledge of laws out of consideration in his response to scepticism. Finally, I turn to Berkeley's account of the role of language in the formation of knowledge as it is developed in the Introduction to the Principles, and highlight his negative evaluation of language in the early intuitionist methodology of knowledge.

In chapter 3, I explore Berkeley's thesis of the language of nature and clarify his account of knowledge of 'the laws of nature', both at the ordinary and the scientific levels, by reference to this thesis. Here I present a novel interpretation of Berkeley's use of the language model in his account.
of knowledge of laws. I will point out the inadequacy of the associationist interpretation supported by Margaret Atherton, developing an alternative view by drawing attention to the pragmatic function of the language of nature. This interpretation is further developed by looking at Berkeley’s account of ordinary knowledge of laws in the *Principles*. Then I turn to his discussion of knowledge of laws at the scientific level and clarify the implication of his distinction of scientific knowledge ‘by rule’ from ordinary knowledge ‘by practice’. I will also consider Berkeley’s critique of Newton’s concept of ‘attraction’ in the *Principles*, and point out the inadequacy of his view of the nature of scientific explanation. Finally, I will discuss his account of arithmetic. This discussion is useful since his account of knowledge of relations by symbolic substitution was first developed through his reflection on the nature of arithmetic.

In chapter 4, I explore the motif of ‘symbolic substitution’ in Berkeley’s theory of knowledge in the middle-period works, *Alciphron* and *De Motu*, and conclude the thesis by pointing out the link between the middle-period view of scientific knowledge and his theory of knowledge in *Siris*. We will see Berkeley’s positive evaluation of the role of language and artificial signs in knowledge acquisition by looking at his exposition of ‘the doctrine of signs’ in *Alciphron*: there he considers the nature of science to consist in the study of sensible reality by symbolic substitution. Further, I try to clarify the interconnection between the introduction of ‘knowledge of relations’ in the second edition of the *Principles* and ‘the doctrine of signs’ in *Alciphron*. On the basis of these discussions, I turn to Berkeley’s treatment of Newton’s mechanics in *De Motu* and consider how his view of scientific knowledge developed in this work can be interpreted in light of the motif of symbolic substitution as is presented in *Alciphron*. Finally, I look at some aspects in his account of knowledge of nature in *Siris* and clarify the sense/understanding distinction he draws there in terms of Berkeley’s middle-period theory of knowledge.
I would like to express the greatest gratitude to my supervisors, David Berman and Paul O’Grady. Throughout the writing of this thesis I received encouragements and invaluable support from them. I have learnt great deal from private conversations with Professor David Berman for years, and they often provided a great stimulus to the development of my ideas. I am very grateful to Dr Paul O’Grady for his constant and warm encouragements throughout the process of writing. I owe great debt to the generous aid he gave me when they were most necessary. It is indeed owing to his patience and timely supports that I was able to complete so long a journey. I would also like to thank Dr Lilian Alweiss for providing me with support and helpful directions at the final stage of the writing. I owe great intellectual debt to a number of writers on Berkeley’s works, whom I mention in bibliography. It will be apparent to the reader that I have been particularly informed by the works of G.A. Johnston, A.A. Luce, David Berman, and Margaret Atherton. I am grateful for what I have learnt from them. Lastly I express special thanks to Professors Tom Stoneham and Margaret Atherton, the examiners of this thesis, for comments and suggestions for improvement, some of which I will need to take time to consider for further work.
References and abbreviations


For *Philosophical Commentaries* (in volume I of the *Works*) I use the edition by George H. Thomas, which is based on Luce’s 1944 edition of the notebooks. For the unpublished manuscript of the *Introduction* to the *Principles* (in volume II of the *Works*) I use Bertil Belfrage’s diplomatic edition of the *Manuscript Introduction*, published in 1987.

References to the works of Berkeley, except to those I mention below, are by volume and page number.

References to *Philosophical Commentaries* are by the abbreviation PC, followed by the entry number assigned by Luce. References to the *Manuscript Introduction* is by the abbreviation MI, followed by the section number assigned by Belfrage.

For other works of Berkeley, I use the following abbreviations.

- **NTV** *An Essay towards A New Theory of Vision* (first ed. 1709; second ed. 1710; third/fourth ed. 1732). Quoted by section.
- **PHK** *The Principles of Human Knowledge* (first ed. 1710; second ed. 1734). Quoted by section.
- **PI** *Introduction to the Principles of Human Knowledge*. Quoted by section.
- **DHP** *The Three Dialogues between Hylas and Philonous* (first ed. 1713; second ed. 1725; third ed. 1734). Quoted by page.
- **DM** *De Motu* (1721). Quoted by section.
- **Alc** *Alciphron, or the Minute Philosopher* (first/second ed. 1732; third ed. 1752). Quoted by dialogue and section.
- **TVV** *The Theory of Vision or Visual Language* (1733). Quoted by section.
- **Q** *The Querist* (1735-7). Quoted by section.
- **S** *Siris: A Chain of Philosophical Reflexions and Inquiries* (1744). Quoted by section.
CONTENTS

Summary v
Acknowledgements vii
References and Abbreviations viii

Introduction 1

Chapter 1: ‘Ideas’ and ‘laws’: two strata of reality and two ways of knowing nature 21
1. ‘Ideas’ and ‘laws’: two basic strata in the Berkeleian natural world 22
   (1) The first stratum of reality: ‘ideas’ 22
   (2) The second stratum of reality: ‘the laws of nature’ 31
2. ‘Intuition’ and ‘foresight’: two ways of knowing nature 38
   (1) Knowledge of ‘ideas’ 38
   (2) Knowledge of ‘the laws of nature’ 46
3. ‘Relations’: the third province of human knowledge 54

Chapter 2: Knowledge of ideas and Berkeley’s early intuitionism 75
1. Cartesian heritage and the intuitionist motif in Berkeley’s response to scepticism 76
2. Ideas, things, and the laws of nature: the limited scope of Berkeley’s intuitionism 89
3. Intuition, foresight, and benevolence of God 102
4. Thinking without words: the meditative ideal of the ‘solitary philosopher’ 115
Chapter 3: Knowledge of laws and the language model of nature

1. The laws of nature and Berkeley’s ‘language model of nature’  

2. ‘Foresight’: the language model and the pragmatic approach to knowledge of laws  
   (1) The language model in the *New Theory*  
   (2) The language model in the *Principles*  

3. Scientific knowledge as ‘the grammar of nature’  
   (1) Knowing the language of nature ‘by practice’ and ‘by rule’  
   (2) ‘Similitude’ and ‘analogy’: ‘attraction’ and the nature of scientific explanation  

4. Signs, rules, and knowledge of number  
   (1) Knowledge of number and its pragmatic orientation  
   (2) Knowledge of number as ‘knowledge of relations’  

Chapter 4: Symbolic substitution and scientific knowledge of nature

1. The ‘doctrine of signs’ and the nature of scientific knowledge in *Alciphron*  
   (1) ‘Force’ and ‘grace’: two modes of the action-oriented use of language  
   (2) Symbolic substitution: the core concept of Berkeley’s ‘doctrine of signs’  

2. Symbolic substitution and scientific knowledge as ‘knowledge of relations’  

3. ‘The grammar of nature’ in *De Motu*: mechanics and metaphysics  
   (1) Berkeley’s view of dynamical concepts as ‘mathematical hypotheses’  
   (2) The ‘mechanical’ and ‘metaphysical’ principles: two senses of ‘causal explanation’ and Berkeley’s demarcation of mechanics from metaphysics  

4. Knowledge and the activity of the mind: the Sense/Understanding distinction in *Siris*  

Bibliography
I thought that as I had failed in the study of material things, I ought to be careful that I did not lose the eye of my soul; as people may injure their bodily eye by observing and gazing on the sun during an eclipse, unless they take the precaution of only looking at the image reflected in the water, or in some similar medium. So in my own case, I was afraid that my soul might be blinded altogether if I looked at things with my eyes or tried to apprehend them by the help of particular senses. And I thought that I had better retreat to the domain of reasoning and seek there the truth of existence. I dare say that the simile is not perfect—for I do not quite agree that he who contemplates things through the medium of thought, sees them only ‘through a glass darkly’, more so than he who considers them in their material existence.

—Plato, Phaedo 99d-e
INTRODUCTION

The chief aim of this thesis is to give an exegetical clarification of Berkeley’s theory of knowledge of nature, particularly focusing on the constructive aspect of his view. The distinctive feature of my study is that it highlights two motifs of his thought as points of reference in my discussion of Berkeley’s theory of knowledge of nature: ‘intuition’ and ‘symbolic substitution’. In this thesis, I address myself to the long-neglected question about the status of ‘knowledge of relations’ in Berkeley’s philosophy and try to make sense of ‘relation’ as the third category (distinct from ‘spirit’ and ‘idea’) of his system of knowledge. My answer to the question is that Berkeley’s introduction of ‘knowledge of relations’ reflects the development of his theory of knowledge of nature. I consider the dominant motif of Berkeley’s theory of knowledge in the early period to be ‘intuitionism’. This motif is conspicuous in his project of rebutting scepticism in his early works, in which he conceives knowledge of nature in terms of knowledge of ‘ideas’. The other motif, ‘symbolic substitution’, is developed in his account of general knowledge of nature, and conceives knowledge of nature in terms of knowledge of ‘the laws of nature’. I argue that Berkeley’s introduction of ‘relations’ to his system of knowledge is closely connected with his positive evaluation, towards the middle period, of the essential role of artificial symbols in the formation of scientific knowledge of laws. In the middle period, Berkeley came to hold that scientific knowledge of ‘the laws of nature’ is knowledge of relations by symbolic representation.

*   *   *

Berkeley is most renowned for the audacious claim about the ontological status of physical things –
that their existence is wholly mind-dependent. Physical things are, in general, nothing more than ‘sensible qualities’ and their ‘collections’, and since whatever sensible qualities are ‘ideas’ which cannot exist without being perceived by the mind, Berkeley concluded: ‘that all the choir of heaven and furniture of the earth, in a word all those bodies which compose the mighty frame of the world, have not any subsistence without a mind, that their being is to be perceived or known’ (PHK.6). To establish the esse-percipi thesis about the physical world and defend it against possible objections was the central concern of Berkeley’s two early works, *A Treatise concerning the Principles of Human Knowledge* and the *Three Dialogues between Hylas and Philonous*. Undoubtedly, Berkeley counted the discovery of this thesis among the most valuable achievements of the ‘long and scrupulous inquiry’ (*Preface to the Principles*) he conducted in the formative period of his philosophy. It is very natural, then, that most of the scholarly works on Berkeley has generally turned to the analysis of his arguments for the mind-dependence of bodies and the assessment of their strength. From the standard viewpoint that the fame of Berkeley as an original thinker rests on his argumentative power of establishing the esse-percipi thesis, the central theme of his philosophy should be the question about the ontological status of physical reality.

Yet, on the other hand, it is clear that for Berkeley, the explosion of the widely accepted belief in matter or the mind-independent physical world was not the goal of his philosophical enterprise but just a starting point. Berkeley started his philosophical career with a clearly constructive program in mind. One major driving force of Berkeley’s intellectual occupation – as well as of his public life – is religion. This is impressively expressed in the closing section of the *Principles*: ‘after all, what deserves the first place in our studies, is the consideration of God, and our duty; which to promote … was the main drift and design of my labours’ (PHK.156). In his estimation, the existence of physical things independent of the mind entails the severance of man from God, and this eventually opens the way to materialistic atheism. And he firmly believes that moral corruption inevitably
results as the sense of God’s direct presence to us lessens. People are on the way towards atheism when they believe in the mind-independence of the objects of sense perception. Philosophers underpinned this vulgar belief by an elaborate theory of material substance, and some of them embraced atheism. The elimination of mind-independent matter is, for Berkeley, a crucial step to restore the sense of ever present God and thereby to bring people back to the life of duties. But besides religion and restoration of morality, there is another major concern which underlies Berkeley’s philosophy in the Principles and the Three Dialogues: the vindication of sense faculty and the reconstruction of science by rebuttal of philosophical scepticism.

As we know from the notebooks (named Philosophical Commentaries by A.A. Luce) of Berkeley, according to his original plan, this book was to be divided into three parts. The Principles we now have consists only of the Introduction and Part I. In the following Part 2 and 3, Berkeley intended to deal with the topics related to ethics and natural philosophy respectively. Unfortunately, however, after the completion of the first part he gave up the remaining parts, and we never know the exact contents and structure of those parts. But we can guess what topics Berkeley intended to discuss in the unwritten parts from the remarks he left in the notebooks and in the published first part. Thus, we see from the notebooks that the second part dealt with the existence and nature of God, human freedom, and the soul’s immortality which together constituted the cardinal principles of morality for Berkeley. And in the third part, Berkeley planned to discuss the nature of space and motion, the cause of natural phenomena, and the principles of natural philosophy. It seems likely that Berkeley intended to develop his views in these parts in a much more constructive manner than he did in the first part. The overall tone of the published Introduction and Part 1 is critical: the chief

1 In the notebook, Berkeley’s explicit mention of the ‘second book’ is found in 508, 807, 878, and of the ‘third book’ in 583. There is a possibility that Berkeley planned yet another book on mathematics, but there is no explicit mention of the fourth book. On Berkeley’s original plan on the division of parts, see Luce’s notes for the entries 508 and 676 in the Philosophical Commentaries: Transcribed from the Manuscript and Edited with an Introduction and Index by George H. Thomas; Explanatory notes by A.A. Luce, Alliance, Ohio, 1976.
aid of it is to clear away the mistakes of his predecessors and thereby prepares the way 'towards erecting a firm system of sound and real knowledge' (PHK.89). The intended project in the first part is mostly of therapeutic nature. But in the subsequent parts where ethics and natural philosophy were to be treated, he would have aimed at positive achievements.

Thus, while the destructive part of Berkeley's philosophical enterprise is undoubtedly important, it would be unwarranted to approach his philosophy only from this perspective. Representing Berkeley as a philosopher whose chief interest was to reduce physical things to the mind-dependent 'ideas' is just like representing Descartes as a philosopher whose chief occupation was to perform 'hyperbolical doubt' and discover the absolute certainty of the existence of the thinking self. But commentators on Berkeley have generally tended in the literature to dwell on the critical examination of his arguments for the mind-dependence of the physical world². Now one of the important subjects which have been left out by such unbalanced approach to Berkeley's philosophy is his positive theory of knowledge. Although it is somewhat surprising when we consider the title of his greatest work, the Principles of Human Knowledge, Berkeley's theory of knowledge has been among the neglected subjects in the literature. Another prominent tendency in the literature on Berkeley has been the concentration on his early philosophy represented by the New Theory, the Principles, and the Three Dialogues. This is certainly understandable, since they are widely recognized, quite justly, as best representing the achievement of Berkeley's philosophical genius as well as the contribution he made to the subsequent history of philosophy. But concentration on the early works seems to have resulted in the minimum regard to his works after the Three Dialogues³.

² This is a general tendency of Berkeley scholarship since A.A. Luce who paid particular attention to the genesis of Berkeley's immaterialism. Scholars of the older generations, such as G.A. Johnston and G Dawes Hicks, took a more comprehensive approach to Berkeley's philosophy.
and the neglect of the possibility of important developments in his thought afterwards.

In this thesis, I explore Berkeley's positive doctrine of human knowledge, particularly focusing on his account of knowledge of nature. And in undertaking the exploration, I will keep an eye on the line of development which Berkeley had gone through in his theory of knowledge of nature from the early to the middle period. At this point, then, the distinction of periods in Berkeley's philosophical career will be in order. In agreement with the standard way of making the three-term division in Berkeley's life, I distinguish three stages of his philosophical thinking as follows. By the *early* period, I understand the heroic period in which Berkeley prepared the notebooks (1707-8) and published his most celebrated works, the *New Theory of Vision* (1709), the *Principles* (1710), and the *Three Dialogues* (1713). By the *middle* period, I understand the period in which Berkeley was publicly most active in his life: it started with his continental tour and culminated in his stay in Rhode Island in prospect of the establishment of a missionary college in Bermuda. In this period, Berkeley wrote *De Motu* (1721), *Alciphron* (1732), and the second edition of the *Principles* (1734). This period also includes such works as the *Theory of Vision Vindicated* (1733), *The Analyst* (1734), and the *Querist* (1735). These works are respectively concerned with vision, mathematics, and political economy, and provide important clues for Berkeley's philosophical views in this period. I will also include the third edition of *Alciphron* (1753) in the sphere of his middle-period thought.

4 Concerning this point, Luce seems to have influenced the subsequent current of scholarship. In "The Unity of the Berkeleian Philosophy (1)", *Mind*, vol.46 (1937), pp.44-52, Luce observed: 'in youth [Berkeley] climbed so high and saw so far that his 'development' could consist only in seeing wider applications of that early philosophy, which he never abandoned, never out-grew, and never changed'. In his defence of the unitarian view, Luce is opposed to the developmental interpretation of Berkeley submitted earlier by G.A. Johnston and G Dawes Hicks in particular.

5 It seems now standard to distinguish the early, middle, and late periods in Berkeley's life, drawing the line between the early and the middle on 1713 (the year he moved to London), and the line between the middle and the late on 1734 (the year Berkeley was appointed Bishop of Cloyne). The classification of his works I make here is thus in general agreement with this division of his life. For an account of such division of distinct periods in Berkeley's life, see David Berman, *George Berkeley: Idealism and the Man*, Oxford: Clarendon Press, 1994, p.71.
for it contains several important additions which are closely linked with Berkeley's middle-period view presented in *Alciphron* and in the second edition of the *Principles*. The 'late' period starts with Berkeley's appointment as Bishop of Cloyne and ends with his death at Oxford, and his philosophy of this period is represented by an enigmatic but very attractive work, *Siris* (1744).

* * *

Reflections on the possibility of knowledge in witness of the rapid development of modern science have an important place in Berkeley's philosophical enterprise. This is clear from his original plan of the *Principles* that its third part deals with the principles of natural philosophy. It is true that Berkeley was not himself a natural philosopher of the rank of Descartes, Boyle, or Newton. But he was far from a passive spectator of contemporary scientific progress. This is sufficiently testified by his pioneering work on the optics and visual theory. And he was certainly not an uncritical admirer of the achievements of the great scientific masters such as those mentioned above. Berkeley regarded it as one of the central concerns of his philosophical endeavour in the *Principles* to inspect the metaphysical foundations of natural philosophy, to scrutinize its basic assumptions, and, if they be proved unsound, to correct them or clear them away for its further advancement.

In exploration of Berkeley's positive theory of knowledge of nature, it will be instructive to start by comparison of his philosophical aspiration with Descartes'. He is generally seen as an empiricist champion succeeding Locke. But in his general perspective on philosophy and human knowledge, Berkeley is more akin to Descartes than to Locke who wished to be a humble 'under-labourer' of scientific master builders. In the early works published when he was very young, he is as confident as Descartes in prospect of rebutting sceptical challenge and defending the original perfection of human cognitive faculty. In the first section of the *Introduction* to the *Principles*, Berkeley describes
a philosopher who finds himself in ‘a forlorn scepticism’ and proceeds to consider the common complaint that our native faculties are essentially deficient. He observes that the blame should be laid not on the alleged limitation of our faculties but on our misuse of them. For Berkeley, it is contradictory that benevolent God puts us in such an unhappy state that our natural faculties are destined to bear no fruit of knowledge by the right and methodical use of them. Thus, the way to knowledge is open before us, and scepticism which ends up with the censure of our faculties is wrong. Scepticism highlights the impenetrable screen between our thought and the real world which neither sense nor reason is able to penetrate. But towards the end of the Introduction, Berkeley pronounces that ‘the fairest tree of knowledge’ is ‘within the reach of our hand’. The key to it is easy: it is just to restore the clear perception our mind is originally capable of by removal of the barrier we have unwittingly contrived ourselves – ‘the curtain of words’ (Pl.24).

Now, at the centre of the early modern philosophical theory of knowledge is the concept of ‘idea’. Since Descartes, the term ‘idea’, which had been traditionally taken to refer to the object of divine intellect, came to stand for the immediate object of human mind. Although there was much debate about the exact ontological status of ‘idea’ in the late seventeenth century, most notably between Malebranche and Amauld, by the beginning of the eighteenth century it became commonplace for philosophers – with very diverse opinions about the status of ‘idea’ – to use it as the central term of epistemology. At the start of his career Berkeley took the concept of idea for granted (as others did), but in the formation of his philosophy this concept underwent a significant modification: an ‘idea’, considered as the object which mediates human mind and the world, was turned the fundamental constituent of the physical world. This transformation of ‘idea’ into ‘things’, of course, is the consequence of his esse-percepi thesis: the existence of sensible qualities consisting in being perceived by the mind, all physical things that compose the furniture of the world are ideas and their collections; the notion of qualities as distinct from ideas and that of unperceiving material
substances in which qualities inhere do not make sense. Thus Berkeley's theory of 'idea' provides the metaphysical underpinning of the epistemological claim that our knowledge of physical reality is 'perfect'. Our knowledge of nature just consists in 'knowledge of ideas'. Since physical things are nothing but 'ideas' as the immediate object of the mind, all sceptical worries which threaten our claim of knowing nature should vanish.

Berkeley's account of knowledge of nature in the *Principles* and *Three Dialogues* is chiefly developed in terms of 'knowledge of ideas', and there he is basically moving, as with the case in his seventeenth-century predecessors, within the *intuitionist* framework of epistemology. Traditionally, 'intuition' is considered the highest form of knowledge. In the early modern age in which 'idea' is made the object of human knowledge, intuition is conceived in terms of the 'clear and distinct perception' of ideas presented to the mind. Descartes demanded all knowledge in genuine sense should be founded on 'intuition'. And he held this form of knowledge to yield 'absolute certainty'. Locke followed Descartes by claiming that knowledge is nothing but 'perception of agreement or disagreement between ideas'. Now in the *Principles* Berkeley divided human knowledge in two basic categories, 'knowledge of ideas' and 'knowledge of spirits'. And for Berkeley who conceives physical reality as composed of 'ideas', knowledge of nature belongs to the category of 'knowledge of ideas'. His central epistemological claim is that the truth of the *esse-percipi* thesis about things entails that we are guaranteed to have intuitive knowledge of them – whenever we perceive ideas, it amounts to intuitive knowledge of physical things at once. On this point, he thinks he is superior to his predecessors who distinguished 'ideas' and 'things' in their espousal of representationalist theory of perception. Berkeley's early project of rebutting scepticism and demonstrating 'perfection of human knowledge' – as is promised on the title pages of the *Principles* and the *Three Dialogues* – was thus developed in the intuitionist framework.

In such optimistic vision about the prospect of achieving 'perfect knowledge' by conquest of
scepticism, Berkeley looks fairly like a Cartesian. Of course, there are significant differences between his theory of knowledge and Descartes'. When Descartes mentions intuition or clear perception of ideas, what he means by 'ideas' are intellectual ideas which are originally implanted in our mind by God, and the intuition of those innate ideas is the function of 'pure intellect' distinguished from sensory perception. By contrast, what Berkeley means by 'ideas' are either 'ideas of sense' or their copies called up to imagination, and the intuition of these ideas is not considered as distinct from sense perception or imagination. Nonetheless, he agrees with Cartesian methodology of knowledge – the first fundamental rule of which is that of 'clear and distinct' perception. It may seem, however, that Berkeley is rather to be affiliated with Locke who, following Descartes, endorsed the intuitionist view of knowledge but conceived perception of 'idea' primarily in terms of sense perception. But we should remember that Berkeley's 'idea of sense', unlike Lockean one, comes directly from God. In the immaterialist world where there is no material substance that causes ideas in our mind, it is God as 'the author of Nature' that is the cause of sensory ideas. Thus, in spite of his reference to sense as the 'inlet' of ideas (PHK.81), Berkeley's 'idea of sense' looks like Cartesian 'idea' implanted in our mind directly by God. Or, as it has been observed since Luce, it would be more appropriate to compare it with Malebranche's 'idea' which is not innate to us but is 'exhibited' to us by God. Human mind is capable of 'perfect knowledge' since we have access to the ideas of direct divine origin – whether their proper location is in us or in God – and the clear and distinct perception of them amounts to it. In contrast to Locke's pessimism about the prospect of human knowledge, Berkeley shares with Descartes (and Malebranche) the view that human mind (as 'an image of God') is capable of 'perfect knowledge'  

6 See Edward Craig, *The Mind of God and the Works of Man*, Oxford, 1987, chapter 1. Berkeley refers to human mind as 'an image or likeness of God' in DHP.231-2. In Guardian Essay no.89, he reports that by inward reflection he found in his faculties an image of divine perfection: 'by this introversion of my faculties ... I regard my own soul as the image of her Creator, and receive great consolation from beholding those perfections which testify her divine original, and lead me into
There is another interesting parallel between Cartesian theory of knowledge and Berkeley's. The important feature of Berkeley's intuitionist view of knowledge is his negative attitude to language. Descartes was not very hostile to the use of language in general (though he accused scholastic language of its drawing on the vulgar prejudices), but Berkeley's attitude to language in the Introduction to the Principles is quite reminiscent of Cartesian attitude to 'sensations'. Whereas Descartes and his successor Malebranche (from whom Berkeley learned Cartesian methodology) regarded the deliverance from sensations as prerequisite to the mind's clear perception of intellectual ideas, Berkeley called for the deliverance from words to obtain clear perception of sensible ideas. Just as sensations are generally given negative evaluation in Cartesian epistemology as the chief source of error, so language is regarded by Berkeley as the principal source of illusions which blocks our way to knowledge – particularly, 'the doctrine of abstract ideas'. The proper method to knowledge is, therefore, to remove the disturbing factor, words, from our understanding and dispel the illusion of abstract ideas. Here the leading thought is that 'perfect knowledge' will be immediately in our reach if only we subtract the bewildering intervention of language and restore the original 'clear sight' of our understanding. In the Manuscript Introduction, Berkeley condensed this methodology of knowledge in the vivid thought experiment of 'the Solitary Philosopher' who is supposed to live in isolation from society and have no use of language. And it would go without saying how this imagery of a philosopher in solitude is akin to Descartes in the Meditations.

In chapter 2, I will explore Berkeley's theory of knowledge in the Principles and the Three Dialogues in the context of his attempt to meet sceptical challenge, and see how he tried to meet the challenge and defend human knowledge along the intuitionist framework as sketched above. But clearly, Berkeley's theory of knowledge of nature will be inadequate as long as it is content with accounting for our knowledge in terms of 'knowledge of ideas'. As I will discuss in chapter 1, the some knowledge of her everlasting archetype' (Works, VII, p.222).
conception of the Berkeleyian natural world as composed of sensible ideas misses another important component of it: the laws of nature. The concept of nature as governed by ‘laws’ is of modern origin: it became prevalent in the latter half of the seventeenth century as Descartes’ mechanical physics gained popularity. By elimination of material substance, Berkeley has made the concept of ‘substance’ and ‘causality’ useless in the account of nature. However, from the earliest stage he acknowledged the lawful order constituting the deeper stratum of physical reality which is more than the flowing individual ideas of sense. In the *Principles*, he considered our knowledge of the laws of nature to be central to the practical concern of life. And needless to say, the concept of law should also be central to Berkeley’s account of natural science. Newton inherited from Cartesian physics the view that nature is governed by a few simple and general laws: his mechanics presented in the *Principia Mathematica* begins with the formulation of the three laws of motion and proceeds to ‘deduce from phenomena’ the law of gravitation by which all motions of bodies in the world are to be uniformly and comprehensively accounted for.

Now knowledge of the laws of nature, unlike knowledge of ideas, cannot be conceived in terms of the ‘intuition’ of the object presented to the mind. In order to explain our knowledge of laws, Berkeley needs to introduce another way of knowing. As I will briefly discuss in chapter 1 and further elaborate it in chapter 3, this way of knowing relevant to the account of knowledge of laws is developed by Berkeley in close connection with his distinctive thesis that the whole natural world is ‘the language of the Author of nature’. The regular order we find in the natural world is

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assimilated to the connection between signs and the things signified which is instituted by God. Accordingly, knowledge of the laws of nature consists in the ability to understand natural signs God constantly presents to us. Thus, knowledge of laws is not to be reduced to ‘knowledge of ideas’ but it is rather ‘knowledge of signs’. The thesis of divine natural language is first developed in the *New Theory of Vision* but appears again in the *Principles*. The conspicuous feature in Berkeley’s account of knowledge of laws in terms of this thesis is that he tends to characterize this type of knowledge as the ability of *prediction* which is practically useful. We acquire ‘foresight’ by learning through experience the sign-signified connections of ideas and thereby steer our way around the world for the interest of life, that is to say, for the attainment of ‘pleasure’ and the avoidance of ‘pain’. Knowledge of laws, considered as knowledge of ‘signs’, is not the ability of *perception* but rather the ability of *perceptual adaptation* to the circumstance by *predictive judgement*.

But now questions arise about how ‘knowledge of laws’ is to be integrated in his overall system of knowledge. *Firstly*, while Berkeley developed the concept of laws as divine natural language extensively in the *New Theory*, it is not very prominent in the *Principles*; and what is most puzzling is that nowhere in the *Principles* Berkeley does not appear to be trying to incorporate his thesis of natural language into his project of responding to scepticism. The same observation applies even more sharply to the *Three Dialogues* in which Berkeley is primarily concerned to show the virtue of immaterialism in coping with sceptical challenge but makes no mention of ‘the language of nature’ at all. As we will see in chapter 2, when Berkeley boasts his philosophy is placed furthest from scepticism, he always points to the immediacy of perceptual knowledge: since the identity of ‘idea’ and ‘thing’ is secured in his immaterialist system, mere perception of ideas sufficiently guarantees knowledge of real things. This kind of knowledge by intuition is absolutely certain and exempt from error. But clearly, this move does not take into account knowledge of laws which is not reduced to mere perception of the present ideas. Knowing laws involves the interpretation of
‘natural signs’, namely, the predicting of what idea will follow the present idea in the course of experience on the basis of the past experience of the regular connections between them. And obviously, there is no absolute certainty in the case of knowing laws thus conceived. Berkeley could appeal to ‘moral certainty’ in defence of knowledge of laws against scepticism, observing that our ability of reading signs generally works well in ordinary life. However, in the Principles and the Three Dialogues, he is always trying to meet sceptical challenge within the framework of intuitionist epistemology. Thus, in his way of coping with scepticism, we can see an indication of the uncertain status of ‘knowledge of laws’ in Berkeley’s early theory of knowledge.

Secondly, another question about knowledge of laws concerns the relationship between two distinguishable levels of it, ordinary and scientific. As it has been noted above, Berkeley developed the concept of the laws of nature by reference to the thesis of divine natural language, and characterized knowledge of laws as the ability of prediction which is practically useful. In the New Theory where Berkeley accounts for visual space perception, the knowledge he is concerned to discuss is the ordinary-level knowledge of laws. But in the Principles, he is also concerned to account for scientific knowledge. There he observes that the aim of natural philosophy is not to discover the ‘efficient cause’ of ideas but to understand ‘the language of the author of Nature’, and this suggests the continuity of two levels of knowledge. At the same time, Berkeley characterizes scientific knowledge as knowledge ‘by rule’ and distinguishes it from the ordinary knowledge acquired ‘by practice’. Thus it seems that science differs from ordinary knowledge in the way or method by which it attains knowledge of laws. But in the Principles, Berkeley does not sufficiently develop his view about the nature of scientific knowledge ‘by rule’. Newton’s mechanics provides him with the model of scientific knowledge, and he regards the Principia as representing ‘the best grammar’ of natural language. There are reasons, however, to conjecture that the account of knowledge of natural language ‘by rule’ or ‘the grammar of nature’ was not fully articulated in
Berkeley's mind at the first publication of the *Principles*. Here we see another indication of the uncertain status of knowledge of laws in Berkeley's early theory of knowledge.

In accordance with his thesis of 'the language of nature' developed in the *New Theory*, Berkeley replaced the ordinary notion of causal relation with the notion of the relation of a sign and the thing signified. When he speaks of ordinary knowledge as acquired 'by practice', he means that we learn the sign-signified relation of ideas by experience of the regular connection of ideas. As we will see in chapter 3 by reference to the *New Theory* and the *Principles*, there is an important pragmatic constraint in the process of learning natural signs at the ordinary level. Since knowledge of laws at the ordinary level serves for our practical concern of life, what constantly guides us in learning the connection of a sign with the thing signified is not just the regular association of ideas but the suitability for teaching us how to act in the attainment of pleasure and avoidance of pain. Thus, at the ordinary level, the objectivity or correctness of our interpretation of the language of nature is to be measured by the general success in the accomplishment of our well-being of life. But how should we conceive of the nature of scientific knowledge characterized as knowledge 'by rule'? Unlike ordinary knowledge, it seems scientific knowledge of laws cannot be attained simply by learning regular connection of ideas by experience; nor can it be reduced to the ability of directing our actions for the interest of life. Of course, it is central to Berkeley's account of science that it is not of purely speculative concern but should be subservient to practical utility. But practical utility of scientific knowledge is rather a consequence of the distinctive feature which it embodies by contrast to ordinary knowledge: 'a greater largeness of comprehension'.

It is the great generality achieved in understanding natural phenomena or connection of ideas that distinguishes scientific knowledge 'by rule' from ordinary knowledge 'by practice'. Berkeley observed that the task of 'the grammar of nature' is to 'frame general rules from phenomena, and afterwards derive the phenomena from those rules' (PHK.108). But as I will discuss in chapter 3
and 4, there is a significant development between the early and the middle period in Berkeley’s view of ‘general rules’. In the *Principles*, he interpreted Newton’s mechanics from a purely phenomenalistic standpoint. According to the account given there, the comprehensive knowledge of phenomena which is achieved by Newton’s formulation of the law of gravitation in the *Principia* is based on the generalization of phenomenal similarities in diverse parts of nature. Explanation of phenomena by ‘attraction’ or ‘gravity’, therefore, rested on the assimilation of them to each other merely on the level of observable regularity. But by the time he wrote *De Motu*, he came to hold that the general law of gravitation and knowledge of phenomena by that law aimed at the common structure of phenomena which lay deeper than the mere observational level. What science is concerned to identify in the attempt to explain phenomena by laws are not their surface similarities but their analogies which are to be made known by the use of ‘hypotheses’. The ‘general rules’ of the natural grammar, then, are not mere empirical generalizations of observable similitude but rather the *postulated* axioms of the hypothetico-deductive system of Newton’s mechanics. In this system the law of gravitation is a ‘general theorem’ deduced from the postulated axioms, the laws of motion, but its truth is confirmed by its general applicability to observable phenomena, terrestrial and celestial motions such as free fall of bodies, tidal movements, and planetary motions.

Thus, in Berkeley’s mature view, the ‘analogies’ of phenomena upon which scientific ‘laws of nature’ are grounded are not simply discovered in phenomena themselves but, to a certain extent, are imposed on them in construction of an explanatory system. This means that scientific knowledge of laws does not rest on a straightforward reading of ‘natural signs’. In order to accomplish ‘a greater largeness of comprehension’ than that possessed by ordinary men, it is necessary for natural philosophers to be *creative or inventive* in the attainment of knowledge of laws. This development of the view of scientific knowledge from the early to the middle period can be traced by comparison of the *Principles* and *De Motu*. But in this thesis I want to interpret it as
interconnected with two significant modifications Berkeley made in the middle period to his theory of knowledge. Firstly, as I will show in chapter 1, Berkeley’s introduction of a new category of object in his system of knowledge, relations, can be interpreted in terms of the development of his view of scientific knowledge. In the first edition of the Principles, Berkeley’s system of knowledge had only two categories, ‘ideas’ and ‘spirits’. But in the second edition, he added ‘relations’ to them as the third province of human knowledge. The question about the status of ‘relations’ in Berkeley’s philosophy has been scarcely raised in the recent literature. But it was discussed earlier by Johnston and Luce. I will argue, by way of discussing Johnston’s interpretation, that Berkeley’s introduction of ‘relations’ is connected with the development of his thought about knowledge, particularly with his recognition of the active creative nature of scientific knowledge of laws.

The second point that I interpret as concurring with Berkeley’s recognition of the creativity of knowledge of laws, which is interwoven with the introduction of ‘knowledge of relations’, is his appreciation of the essential role of artificial signs in scientific knowledge in the middle period. My contention, which will be elaborated in chapter 4, is that Berkeley’s account of scientific knowledge of laws became full-fledged when he combined with it ‘the doctrine of signs’, as it is developed in Alciphron, and arrived at the position that scientific knowledge which aims at a comprehension of natural phenomena by the most general laws essentially involves the systematic and skilful use of artificial signs. What I want to highlight as the core insight of Berkeley’s ‘doctrine of signs’, which has hitherto not attracted attention in the literature, is the concept of symbolic substitution. One of

8 Ernst Cassirer, in his discussion on Berkeley’s philosophical system in Das Erkenntnissproblem, pointed out the importance of the notion of ‘substitution’ presented in Alciphron. See Ernst Cassirer, Das Erkenntnissproblem in der Philosophie und Wissenschaft der neueren Zeit, Zweiter Band, Georg Olms Verlag, New York, 1971, S.318. (Cassirer uses the German word ‘Stellvertretung’ for ‘substitution’) Although Cassirer does not develop his interpretation of Berkeley’s account of substitution by symbols in detail, it is worth noting that the concept of ‘substitution’ (or symbolic representation) plays an important role in Cassirer’s own philosophy developed in his Philosophy of Symbolic Forms. In his theory of concepts, Cassirer explains conceptual thought in terms of representation of the ‘forms of relation’ by symbols. See The Philosophy of Symbolic Forms.
the important implications of the concept of 'substitution' is the positive evaluation of the potential of symbols as the means to acquire knowledge: words and signs do not merely play the static role of recording and utilizing the knowledge we already possess, but they also play the heuristic role in further advancement of knowledge. Thus Berkeley's notion of symbolic substitution in _Alciphron_ suggests that _the use of symbols can create new contents of thought independently of the perception of ideas_. This is a clear departure from his early intuitionist view of knowledge. Another important implication of the concept of symbolic substitution is that 'relations' are made the object of understanding only through symbolic manipulations. This is explicitly stated in the third edition of _Alciphron_, illuminating the important connection between the third province of 'knowledge of relations' and 'the doctrine of signs' which has been neglected by commentators.

In Berkeley's middle-period thought, the creativity of scientific knowledge of laws, the concept of 'symbolic substitution', and 'relations' as the third kind object of knowledge, are mutually interconnected. Taken together, they constitute a new dimension of Berkeley's theory of knowledge which is distinct from the early intuitionist framework based on 'ideas'.

As we will see in section 4 of chapter 3, knowledge of laws by creative symbolic representation is anticipated in his account of arithmetic in the early period. In the _Principles_, Berkeley rejected the received view of arithmetic as knowledge of abstract idea of number, insisting that the science of arithmetic is concerned with the manipulation of numeral symbols and their application to particular sensible things. In conjunction with the thesis that number is the mind's creature, this is generally taken as a purely nominalist or 'formalist' view of the nature of arithmetic. But through critical discussion of Douglas Jesseph's interpretation I will argue that the formalist view of arithmetic does not sit well with Berkeley's pragmatic approach to arithmetic. Hence, in my view, Berkeley holds that number does not consist in mere signs but in the _relations_ of particular things.

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and that knowledge of number is ‘knowledge of relations’ by symbols. My interpretation accords well with Berkeley’s pragmatic view of arithmetic, since it ascribes to him the view that knowledge of number is the ability to regulate actions about particular things by symbolic representation of their relations, i.e. numbers. The important point in my interpretation is its emphasis on the concept of analogy in Berkeley’s account of arithmetic. ‘Analogy’ is the relational structure of things which is ‘expressed’ by the symbolic system defined by certain general rules, and Berkeley can be seen as affirming the objectivity of arithmetical truths through his concept of ‘analogy’. The arbitrary choice of signs and the relativity of denomination which he insists in the Principles do not necessarily lead to the subjectivist view of arithmetic, since the relational structure of things expressed by symbols is kept constant through the use of different symbolic systems.

This interpretation of Berkeley’s account of arithmetic, I must admit, is not clearly developed in the Principles, and he never explicitly formulated knowledge of number in terms of knowledge of ‘relations’. But it can be reasonably attributed to him by taking into account his second-edition introduction of ‘relations’ in his system of knowledge and his discussion of ‘the doctrine of signs’ in Alciphron. By the middle period he came to hold that scientific knowledge in general, not restricted to arithmetic, is to be characterized as ‘knowledge of relations’ by symbols. In the seventh dialogue of Alciphron, Berkeley argues that scientific terms like ‘number’ and ‘force’ are used meaningfully without distinct ideas corresponding to them, and that the use of those central terms of the sciences of arithmetic and mechanics consists in the regulation of our actions by the stipulated general rules.

He develops this view of scientific terms as pragmatically oriented by taking arithmetic (and algebra) as a paradigmatic model of scientific knowledge. As we will see in section 2 of chapter 4, the novel insight which he shows in Alciphron, which is not present in the Principles, is the concept of aptness applied to the scientific use of symbols. Science essentially involves ‘substitution’ of things by artificial signs, and scientific progress depends, as he put it, on ‘the apt choice and skilful
management of signs’. Now Berkeley observes that scientific symbols are said to be *aptly chosen* in accordance with their *heuristic significance in the formulation of ‘general rules’*. In his account of arithmetic, the Arabic-Indian numerals give a good example of the ‘aptly chosen’ signs: by the invention and use of the numerals many general rules and theorems about numbers are formulated and thereby our knowledge of number as ‘knowledge of relations’ is greatly advanced.

Berkeley’s view of scientific knowledge of laws in the middle period is thus best appreciated by reference to his account of arithmetic as sketched above. His view of scientific knowledge of laws as ‘knowledge of relations’ by symbols can be illuminated by paying attention to ‘the parallelogram of force’ which he mentions in *De Motu* and in *Alciphron*. In *De Motu*, Berkeley observes that, while the terms like ‘force’ and ‘gravity’, being ‘mathematical hypotheses’, do not refer to any real quality in bodies, they nonetheless are useful in mechanics insofar as they play significant roles not just in calculating phenomenal motions but also in formulating the fundamental laws of motion.

The point of particular importance is to note that Berkeley mentions ‘the parallelogram of force’ in his talk of ‘force’ as a useful ‘hypothesis’. Now, ‘the parallelogram of force’ plays crucial roles in Newton’s *Principia* and it is well known that Newton’s success in accounting for celestial and terrestrial motions by the single law of gravitation depended on his conception of elliptical orbits of celestial bodies as resulting from the composition of two different kinds of force, i.e. inertial force in the direction of the tangent and gravitational attraction towards the centre of the orbital motions such as the sun and the earth. Although Berkeley denies that the resolution and composition of force in the analysis of orbital motion do not correspond to the forces which really reside in bodies, he acknowledges that it helps us discover the ‘analogies’ of natural phenomena. Thus for Berkeley, the usefulness of ‘the parallelogram of force’ in mechanics consists not in that it discovers us real physical cause of phenomena but because it helps us discover hidden analogies of them through manipulation of the ‘aptly chosen’ symbols (i.e. geometrical diagrams). The formulation of the law...
of gravitation crucially depended on the ‘analysis’ (as Newton stated in Query 31 of the *Optics*) of motion by ‘the parallelogram of force’ which Newton laid out in the first Corollary to the three laws of motion. With regard to mechanics, as well as to arithmetic, Berkeley sees the use of symbols which aptly serve to ‘express’ the relations of things as significant in heuristic terms, and accordingly in the middle period he characterizes scientific knowledge of laws as ‘knowledge of relations’ by symbolic substitution which is distinct from mere ‘knowledge of ideas’.
Chapter 1

‘Ideas’ and ‘laws’: two strata of reality and two ways of knowing nature

In this chapter, I give a preliminary discussion of ‘idea’ and ‘the law of nature’ in Berkeley’s philosophy. These two components of Berkeley’s natural world will be the centres of our concern in discussion of the following chapters.

In section 1, I will observe that there are two basic strata in Berkeley’s positive conception of nature, ‘ideas’ and ‘the laws of nature’. Berkeleian scheme of things is usually considered to consist of two categories, ‘ideas’ and ‘spirits’. Accordingly, the natural world is conceived as the world of ‘ideas’. But I will draw attention to the point that ‘the laws of nature’ constitutes the deeper stratum of nature for Berkeley. Thus Berkeley’s conception of nature, which repudiates the existence of ‘substance’ and ‘causality’ in nature but acknowledges the existence of the stable regular order in it, can be called functionalism. In the first half of this section, I clarify Berkeley’s concept of ‘ideas’ by comparison with his predecessors’, particularly with Descartes and Malebranche. In the second half, I briefly discuss Berkeley thesis of ‘the language of nature’, and considers the implication of Berkeley’s concept of natural order as language by comparison with ordinary notion of causality and scientific notion of mechanical necessary causation.

In section 2, two ways of knowing nature are distinguished which correspond to the two basic strata of nature introduced in section 1. I call the one ‘intuitive’ and the other ‘predictive’, and discuss the structure and the nature of each type of knowledge by reference to the relevant text of the Principles and Three Dialogues. As to the intuitive knowledge which applies to knowledge of ‘ideas’, I will observe in the first half of the section that Berkeley conceives it in terms of simple perceptual apprehension, and that he considers it to constitute ‘perfect knowledge’ because of its
transparency and infallibility. The nature of intuitive knowledge will be further explored by comparison with Russell’s ‘knowledge of acquaintance’, and a brief discussion will be given with regard to the twentieth-century criticism of the sense-datum theory. In the second half, I discuss the structure of predictive knowledge which applies to knowledge of ‘laws’. This type of knowledge involves judgement about the non-present ideas, and it is linked with Berkeley’s thesis of ‘the language of nature’. My discussion of predictive knowledge in this chapter will be brief since it is the topic to be further explored in chapter 2 and 3. Here I will pay attention to the ambiguous status of knowledge of physical things as ‘collections of ideas’.

In section 3, I discuss the new development in Berkeley’s system of knowledge in the second edition of the *Principles* which has been neglected in the recent literature, that is, the introduction of ‘relations’ to his system of knowledge. I will suggest that ‘knowledge of relations’ as comprising the third distinct province of knowledge is particularly correlated with the development of his view about knowledge of nature. I will develop my interpretation of the place of ‘relations’ in Berkeley’s theory of knowledge through discussion of G.A. Johnston’s interpretations in particular. It will be argued that Johnston missed the unique place of knowledge of relations in that he saw ‘knowledge of relations’ solely in connection with what he calls ‘the doctrine of notions’ which accounts for universal knowledge in terms of mental acts and that he failed to link it to ‘the doctrine of signs’. My own interpretation is that ‘knowledge of relations’ is to be located at the intersection of ‘the doctrine of notions’ and ‘the doctrine of signs’.

1. ‘Ideas’ and ‘laws’: two basic strata in the Berkeleian natural world

(1) The first stratum of reality: ‘ideas’

In the history of philosophy from ancient to modern, the concept of ‘substance’ (which is to be
traced back to the Greek word οὐσία, which means ‘being’) played the central role in the construction of metaphysics and epistemology. In diverse great systems of traditional philosophy, the conceptualization of what there are in the world and the account of how we know them rested on the individual philosopher’s conception of the nature of substance.

Substance in the traditional philosophy is conceived, on the one hand, as the ultimate structuring principle of the world. It is the source of all the existences, orders, and changes which we daily observe in the natural world: we see various qualities and relations, but they are said to ‘be’ only because they are in the more fundamental, independent ‘being’ which does not require something else to inhere in; we see qualities and relations constantly appearing and ceasing to be, but all these ‘becomings’ occur because there is some stable persistent ‘being’ through the process of changing; we see bewildering varieties of qualities and relations ever flowing before our eyes, but at the same time recognize some order and unity in such flow of experience. Substance is thus conceived as the principle of inherence, constancy, and unity without which the phenomenal world would not possibly exist. In theory of knowledge, on the other hand, knowing things as substance is considered to consist in knowing their ‘essence’. Among the qualities we attribute to a thing, some are such that the thing would cease to be if it was deprived of them; others are such that the thing would survive even if it no longer possessed them. While the latter is called ‘accidental’, the former is said to constitute ‘essence’ of the thing, by virtue of which the thing is what it is. To know a thing, then, is to know those essential qualities which make it a distinct ‘kind of being’. In the mediaeval scholastic philosophy, the doctrine of essences, or ‘substantial forms’, was concerned to account for phenomenal behaviour of individual things and classify them by assigning them the proper places in the hierarchical system of genera and species.

The conspicuous feature of Berkeley’s philosophical system is that there is no such thing as ‘substance’ in the world of physical things. The first section of the *Principles* begins with a survey
of ‘the objects of human knowledge’. The concise description of physical reality in this section omits the mention of ‘substance’ and thereby suggests that the fundamental constituent of reality for Berkeley is not substance as is traditionally conceived by philosophers. The objective physical world is to be composed of ‘sensible qualities’ or ‘ideas’ of each particular sense modality. These are genuinely basic entities in their own right, and they need no ‘material substance’ to inhere in.

By sight I have the ideas of light and colours with their several degrees and variations. By touch I perceive, for example, hard and soft, heat and cold, motion and resistance, and of all these more and less either as to quantity or degree. Smelling furnishes me with odours; the palate with tastes, and hearing conveys sounds to the mind in all their variety of tone and composition. And as several of these are observed to accompany each other, they come to be marked by one name, and so to be reputed as one thing. Thus, for example, a certain colour, taste, smell, figure and consistence having been observed to go together, are accounted one distinct thing, signified by the name apple. Other collections of ideas constitute a stone, a tree, a book, and the like sensible things.

At the stage of this opening section, of course, Berkeley does not yet draw the radical conclusion that there are no substances in the natural world which are distinct from particular sensible qualities or ideas of sense and which are supposed to be the bearer of those qualities or ideas. But in the subsequent sections he goes on to develop arguments to show that such received concept of material substance is either contradictory or meaningless. Thus, the description of physical reality in this section is not merely giving the picture of how we come to articulate reality as inhabited by such things as apples, stones, trees, etc., starting with experience of particular qualities or ideas. Rather, it gives the picture of the world as it really is: physical reality is composed of those individual items as they are given to each sense, which exist without any need of other more basic
kind of physical or material entity in which they inhere, and substantial objects like apples and trees are nothing more than ‘collections’ of those free-floating items given to the senses.

Berkeley’s account of physical things as ‘collections of ideas’ rejects the traditional conception of the ontological priority of substance to qualities. According to the ‘collections’ account, what is traditionally conceived as ‘substance’ presuppose the existence of ‘qualities’, and not vice versa. Ordinary physical things which are the centre of our concern in everyday affairs of life, are regarded as ontologically secondary. As it is said in the above passage, there is a thing like ‘apple’ in nature only because we pick out some from among the multitude of qualities we perceive one after another and bundle them to constitute one thing with one name attached to it: the thing ‘apple’ does not exist in nature in genuine sense but rather posited in nature by us through the mind’s collecting of qualities and regarding them as ‘one distinct thing’. In the *Three Dialogues*, the same point is made more expressly in the statement of Berkeley’s spokesman Philonous that what we consider one individual physical thing is just the product of our linguistic practice which aims to serve ‘for conveniency and despatch in the common actions of life’ (DHP.246). By contrast, what sensible qualities exist in nature does not depend on our everyday concern for action and linguistic practice; for they are present to us by virtue of our having the senses we now have and being in a certain situation appropriate for perceiving them, whether it is convenient for us or not. The existence of sensible qualities is just the presence of ideas as they are ‘imprinted on the senses’, as Berkeley put it in his definition of the first category of ‘the object of human knowledge’.

According to Berkeley’s new picture of the natural world, therefore, the ontological hierarchy of ‘being’ seems to be the reverse of traditional conception. The objects of sense which we take as qualities of things are now assigned the status of distinct individual things which have their own ‘being’ by themselves, constituting the fundamental units of reality: it is no longer the case, as is traditionally conceived, that they are real only by virtue of ‘being in’ a certain more basic thing.
which is considered to ‘be’ in genuine sense. Each of the qualities of an apple, such as ‘colour, taste, smell, figure and consistence’, constitutes the ultimate stratum of ‘being’ without having another distinct level of ‘being’ considered as the sub-stratum which supports the ‘being’ of qualities. But, of course, it is not that Berkeley assigned self-subsistent being to sensible qualities. According to his esse-percipi thesis, the ‘being’ of those qualities consists in ‘being perceived’ by minds or spirits, and thus they are properly called ‘ideas’ or ‘sensations’ (PHK.3-5). Hence it is concluded that ‘there is not any other substance than spirit, or that which perceives’ (PHK.7). Material substance being eliminated, spirits are now assigned the role of substance for all sensible qualities qua ‘ideas’. This being granted, however, it should still be noted that Berkeley considers ‘ideas’ to comprise one of the two distinct kinds in the general category of ‘thing or being’ with spiritual substance (PHK.89). While ideas depend on spirit’s perception for their ‘being’, they are nonetheless not identical with the ‘being’ of spiritual substance or the parts of it.

As it has been observed, the ontological status of ‘idea’ in Berkeley’s philosophy appears idiosyncratic from the standpoint of traditional ontology. The concept of ‘idea’ is central to his analysis of perceptual awareness, as it is for all major philosophers of the early modern age. But Berkeley departs from the assumption of traditional ontology by conceptualizing ‘idea’ in the way in which it cannot be classified to the two basic categories of being: ‘substance’ and ‘mode’. In traditional metaphysics, substances are independent, self-subsistent being; whereas modes (or accidents), such as activities and qualities, are dependent being which only exist ‘in’ a substance. At the same time, this relation of ontological inherence is seen as corresponding to the relation of ‘predication’: while the term denoting ‘mode’ is to be predicated of the term denoting ‘substance’, substance is the ultimate subject which is incapable of being predicated of anything else. Now Berkeley holds that ideas are dependent being existing only ‘in the mind’. But contrary to the traditional assumption, he denies that ideas are ‘modes’ of the mind. To the possible objection that
the existence of qualities like extension and figure ‘in the mind’ should entail that they are
predicated of the mind, he replies: ‘those qualities are in the mind only as they are perceived by it,
that is, not by way of mode or attribute, but only by way of idea . . . As to what philosophers say of
subject and mode, that seems very groundless and unintelligible’ (PHK.49).

Although Berkeley here speaks as if no explanation is necessary of what it means for ideas to
be in the mind ‘not by way of mode or attribute, but by way of idea’, it is not immediately clear
what he exactly wants to convey with this statement. Indeed, since Descartes, there were varieties
of understanding about the relationship of idea to the mind perceiving them. The generally accepted
definition of ‘idea’, which appears in the text of Descartes, Malebranche, Locke, and others, was
that it was ‘the immediate object of the mind or understanding’9. But opinions were divided among
philosophers over the exact location of this ‘immediate object’ in relation to the mind. Descartes’
view of idea is complex and affords conflicting interpretations, but he largely seems to be inclined
to conceive ideas as ‘modes of the mind’. As he famously argued in the Third Meditation, ‘idea’
may be considered in two different ways: in terms of ‘formal reality’, it is nothing but modifications
of the mind; in terms of ‘objective reality’, it is an external thing as it exists objectively in the mind10.
To put it in a more plain language, ‘idea’ is the mind’s act of thought or perception which represents
an external thing. Thus, according to Descartes, an idea as the immediate object of mind is not
distinct from the mind, and this conception of idea is in line with the traditional substance-mode
ontology. Malebranche, however, rejected such Cartesian conception of idea as ‘mode of the mind’
and located it in God: ideas are not mere mental modifications but the archetypes of created things

9 Berkeley mentions this definition of ‘idea’ in section 45 of the New Theory of Vision: ‘I take the
word idea for any the immediate object of sense or understanding, in which large signification it is
commonly used by the moderns’.
10 Descartes: Selected Philosophical Writings, translated by John Cottingham, Robert Stoothoof,
Dugald Murdoch, Cambridge, 1988, pp.90-1. In the Second Replies, idea is defined to be ‘the form
of any given thought, immediate perception of which makes me aware of the thought’; and the
ideas’ objective reality is defined to be ‘the being of the thing which is represented by an idea, in so
far as this exists in the idea’, Ibid. pp.152-3.
in the divine intellect. According to the Malebranchean view, then, ideas as immediate objects are entirely distinct from finite perceiving minds, having independent existence in God. Locke, by contrast to both Descartes and Malebranche, can be seen as deliberately avoiding commitment to any specific view about the ontological status of ideas. In the beginning of the *Essay*, Locke defined 'idea' broadly as 'whatsoever is the object of the understanding when a man thinks', but in keeping with his 'historical, plain method' he never ventured to go into the 'physical inquiry' of the cause of ideas or metaphysical speculations about the ontological status of ideas.¹¹

Now Berkeley's denial of the status of 'mode or attribute' to idea in section 42 may be taken to suggest that he rejects Cartesian conception of idea. But it still seems the case that his conception of the idea's being in the mind is harmonious with the concept of idea as 'objective reality': for Descartes considers the objective reality of an idea to consist in the existence of a thing *objectively* in the mind, and this is just tantamount to saying that the mind's perception has a certain *content* as the immediate object of awareness.¹² When Berkeley observes that 'qualities are in the mind only as they are perceived by it', he can reasonably be taken as saying just the same thing. However, we should consider at this point what Berkeley states in the very beginning of the *Principles* where he first introduces spiritual substance. In section 2, he unambiguously states that what we call 'mind, spirit, soul, or my self' denotes 'a thing *entirely distinct* from' ideas. The claim of 'entire distinction' between mind and ideas is further emphasized to the point of asserting the 'heterogeneity' of their being (PHK.89/141). These assertions, as it has been observed since Luce, undoubtedly urges us to see Berkeley's conception of idea on the Malebranchean model.¹³ It was Malebranche who gave idea as objective reality the robust character of solid reality standing in its own right: the content of

¹¹ Essay, Book 1, Chapter 1, section 2 & 8.
immediate perceptual awareness is a thing that really exists, an object distinct from the mind and its act of perception. Furthermore, Berkeley agrees with Malebranche that ideas, considered as robust things distinct from perceptual awareness, are directly ‘exhibited’ to us by God (DHP.231).

But, of course, we should not take the similarity between Berkeley’s and Malebranche’s conceptions of ‘idea’ too far, though Luce tended to do so. Clearly, his view is decisively different from Malebranche’s in the following points. (1) Unlike for Malebranche who considers ideas to be uncreated archetypes of physical things in God’s intellect, ideas for Berkeley are only creatures of God’s will which are every moment produced. As he frequently put it, they are ‘effects’, the items which are ‘imprinted on’ or ‘excited in’ finite spirits. (2) For Berkeley, ideas as objects of perceptual awareness are ‘our own ideas’: they are, unlike Malebranchean ideas which are located in the public realm of God and accessible to all minds, private possessions of each mind which perceives them. He suggests in several places that different finite spirits do not perceive numerically the same idea, but only perceive qualitatively similar ideas (PHK.140). (3) Since ideas for Berkeley are only ‘effects’ in our mind, they bear a temporal and passing character. That is, they are ‘fleeting, perishable passions’ (PHK.89; first ed.), or ‘perpetually fleeting and variable’ (DHP.206). By contrast, Malebranche’s ideas, being uncreated archetypes in God, are eternal and immutable. (4) Berkeleian ideas are all objects of sense and particular beings, and in Berkeley’s system there is no place of the existence of ‘abstract general ideas’, whether they are formed by mental abstraction or are uncreated entities in a certain supernatural realm. Malebranchean ideas are Platonic universals and objects of pure intellection. (5) Berkeley certainly agrees that God must perceive those ideas he

14 Luce emphasizes the affinity of Berkeley’s conception of ‘idea’ with Malebranche’s in the context of defending what he regards as Berkeley’s ‘realism’. According to him, Malebranche ‘showed Berkeley how our ideas can be also God’s ideas, thereby laying a foundation for inter-subjective thinking’ (Berkeley and Malebranche, p.83); ‘Real things, … for Berkeley, are in God and are our ideas. I have real ideas; therefore some of my ideas are also God’s ideas. This twofold status of the idea comes out repeatedly in the Principles, and … it is one of the major results of Malebranche’s study of the nature of ideas’ (Ibid., p.84).
creates in us, and in several places he gives a licence to talking about the archetypes in God’s mind, corresponding to our own ideas which are ‘ectypal’ (DHP.254). But he rightly emphasized that he is far from affirming with Malebranche that we need, in perceiving physical objects surrounding us, to contemplate their archetypes in God. To sum up, taking into account the points given above, Berkeley’s ‘idea’ – here I do not take into account his occasional discussion of the archetypal idea in God’s mind, for they are not objects of human knowledge – looks more akin to Malebranche’s ‘sensation’ than to Malebranche’s ‘idea’, though it should be always remembered that Berkeley rejects Malebranchean view of sensation as ‘modifications of the mind’\(^\text{15}\). Indeed, Berkeley frequently uses ‘idea’ and ‘sensation’ as interchangeable terms.

In spite of these prominent differences, however, it remains true that the ontological status of ‘idea’ in Berkeley’s metaphysical system can be best clarified by comparison with Malebranche, for it highlights the point that Berkeley’s ‘idea’ is a certain substantial thing which does not fall under the categories of the traditional substance-mode ontology. Berkeley agrees with Malebranche in that ‘idea’ is a distinct category of thing or being in its own right, constituting its own realm of reality distinguishable from both mind and matter. By appeal to the principle that ‘to see nothing is not to see’, Malebranche concluded the real existence of the contents of perception from the very occurrence of perception of them. When we perceive or think of something, he argued, it must necessarily exist because perception of a non-existent is equivalent to no occurrence of perception: ‘there is a contradiction in saying that we can immediately see what does not exist, for this is to say at the same time we see and do not see, since to see nothing is not to see’\(^\text{16}\). Likewise, Berkeley


\(^{16}\) Malebranche, The Search after Truth, Book IV, chapter11, section 3 (L.O.320). All references to Malebranche’s Search are from The Search after Truth, translated by Thomas P. Lennon and Paul J. Olscamp, Ohio University Press, 1980. In quotations from this translation, I use the abbreviation
argued that our perception of a sensible object necessarily entails its real existence: ‘I see this cherry, I feel it, I taste it: and I am sure nothing cannot be seen, or felt, or tasted: it is therefore real’ (DHP.249). Berkeley, with Malebranche, holds that ideas are said to ‘exist’ for the very reason that they are perceived by the mind. And what this implies is that ideas are distinct entities of which various qualities are to be predicated: the qualities we perceive in ideas are not the qualities of things which ideas are about but the qualities of ideas themselves. Thus in the hands of these two philosophers, ‘idea’ has become almost like a ‘substance’. Ideas are no mere ‘intentional objects’ or representational contents that are said to be real only by reference to the external material objects: they are not like Cartesian ideas which are ‘the mode of being by which a thing exists objectively in the intellect by way of an idea’; nor are they like Locke’s ontologically neutral ideas which are analogous to mirror images. For Malebranche and Berkeley, ideas are not mere shadows or images of real things but real things themselves.

(2) The second stratum of reality: ‘the laws of nature’

In the above, we have seen that in Berkeley’s new system of reality sensible qualities qua ‘ideas’ are considered to be the fundamental stratum of the natural world. In this system, sensible qualities such as redness, hardness, sweetness, etc., which are all ‘ideas imprinted on the senses’, are beings in their own right and provide the ultimate unit of physical reality out of which physical things like an apple are constituted. ‘Substance’ as is traditionally conceived vanished from Berkeley’s new picture of the natural world. Now, it is not only substance that has prominent place in other systems of natural philosophy but is assigned no place in Berkeley’s: causal power is also deprived of physical reality. Berkeley argues that objects of sense perception are all inert entities, for we cannot

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17 Descartes, op. cit., p.91.
observe any power in them by attentive perception. ‘All our ideas, sensations, or the things which we perceive, ... are visibly inactive, there is nothing of power or agency included in them. ... To be satisfied of the truth of this, there is nothing requisite but a bare observation of our ideas’ (PHK.25).

In everyday life, we are easily misled by the experience of regular conjunction between ideas. When we experience, for example, constant co-presence of the visible idea of a very bright disc in the sky (a collection of ideas we name ‘the sun’) and the feeling of heat in our hand, we mistakenly infer that it is the visible idea of a bright disc (which we call ‘the sun’) that causes it because we are aware that the feeling of heat is not caused by our own will (PHK.32). But, as Berkeley sees it, such inference is ‘absurd and unintelligible’ (Ibid.). Our accustomed practice of ascribing causal power to sensible things may have its useful functions, but it is still the error which, in terms of strict philosophical truth, should be corrected by ‘attentive perception’.

It is not, however, that Berkeley thinks our belief in causal interactions between physical things is to be entirely falsified. The truth about natural causality, according to him, is that all those becoming and ceasing which we perceive in the realm of sensible objects are directly caused by God, whom Berkeley calls ‘the Author of nature’ or ‘the governing spirit’. But this ascription of all causal productions to the direct operation of God does not necessarily mean that he adopted unrestricted supernaturalism for the understanding of natural phenomena. Just as Malebranche, who ascribed all natural causation to the efficacy of God’s will, retained ‘occasional causes’ even after his vehement attack on the notion of ‘secondary’ causes, so Berkeley retains ‘natural signs’ to express the horizontal relationship of natural phenomena. Our understanding of nature is not completed merely by knowing the vertical relation between natural processes and the general cause of them, God. It is also necessary to know the particular ways God operates in the production of natural processes, and this involves understanding the sign-signified relations between phenomena: ‘the connexion of ideas does not imply the relations of cause and effect, but only of a mark or sign
with the thing signified (PHK.65). To be sure, as it has been observed by commentators, this notion of 'natural sign' does not exactly correspond to the ordinary notion of natural causality\(^{18}\). Berkeley acknowledges in section 51 that ordinary locution such as 'fire heats, water cools' certainly implies the notion of agency ascribed to fire and water. Berkeley's recommendation of the 'sign'-locution is clearly intended to exclude such ascription of agency or productivity to physical things. But he would still hold that to say that 'fire signifies heat' is more conformable to philosophical truth than to say that 'fire heats'; though, at the same time, he allows it necessary 'to speak with the vulgar' since the demand for conformity with the propriety of language is to be given priority 'in the ordinary affairs of life' (PHK.52).

The recognition of 'natural signs' in the inventory of the Berkeleian natural world now leads us to the exploration of the second, deeper stratum in Berkeley's conception of reality. Since ideas of sense present themselves to the perceiving mind not as indifferently succeeding one another but as articulated in the sign-signified relations by which one idea anticipates another, it cannot be the case that Berkeley's conception of physical reality is exhausted by the stream of discrete sensible ideas each of which exists independently of others. There should be yet another stratum of reality which underlies the first stratum of ideas and forms them into the stable semiotic connections. Berkeley introduces this second stratum of reality, 'the laws of nature', in section 30 of the Principles.

\[\text{The ideas of sense have} \text{ a steadiness, order, and coherence, and are not excited at random, as those which are the effects of human wills often are, but in a regular train or series, the admirable connexion whereof sufficiently testifies the wisdom and benevolence of its Author. Now the set rules or established methods, wherein the mind we depend on excites in us the ideas of sense, are called the Laws of Nature.}\]

Though 'substance' and 'causal power' are eliminated from nature, Berkeley does not thereby reject altogether the structuring principle of reality which underlies the realm of ideas. As he put it in section 150, what 'by Nature is meant [is] the visible series of effects, or sensations imprinted on our minds according to certain fixed and general laws'. In marked contrast to his talk about individual sensible ideas, his reference to 'the laws of nature' is frequently accompanied by such adjectives as 'steady', 'constant', 'fixed', 'established', or even 'immutable'. It is because the laws of nature which are steady and constant are incorporated into presentation of sensible ideas that the continuous flow of ideas is said to constitute 'the ordinary course of things' or 'the course of nature' (PHK.30/57/141). Berkeley's accustomed expressions in referring to the totality of nature, such as 'the whole frame of nature' or 'the whole system of beings' (PHK.151/153; my italics), well captures the centrality of the notion of fixed order to his conception of nature.

Berkeley's conception of nature, then, can be appropriately called functionalist: what underlies observable phenomena as the deeper stratum of nature is just a system of connections or relations, and not another distinctive realm of things. But we now confront a question about the status of this second stratum of physical reality. The ontological status of 'the laws of nature' in Berkeley's metaphysical system is no less problematic than that of 'ideas' from the viewpoint of traditional metaphysics. Since he deprived causal power of physical reality by reducing all the component entities to inert inactive ideas, it should follow that the laws of nature cannot have real foundation in the natural world. Material substance in traditional metaphysics played the role of causal agency as well as that of the bearer of qualities, but Berkeley has exploded it. He accuses philosophers of their vain search for 'secondary causes' and insists that we should locate the true agency directly in God: it is the 'will' of God that 'constitutes the Laws of Nature' (PHK.32). This transference of the locus of the structuring principle from the physical to the spiritual realm, however, means that there
remain in nature only connections or relations between things which has no real foundation in the things related or connected. If God’s will should directly ‘constitute’ the lawful connections of nature without interposition of physical agents which perform lawful activities by their own power, then the laws which integrates natural events should be mere abstraction; for God, who is the true cause of natural processes, is transcendent to and distinct from those natural processes themselves. In other words, Berkeley should conceive the lawful connections between things qua sensible ideas as something, as it were, accidentally and extrinsically imposed on them.

As a matter of fact, this is exactly the import Berkeley wants to propagate by the replacement of causal connections in nature with the sign-signified connections. As it is generally acknowledged in the literature, the central message of his thesis of ‘the language of nature’, which was first developed in the New Theory of Vision, lies in the repudiation of ‘necessary connection’ in nature. In sections 60-66 of the Principles, Berkeley confronts the prevailing notion of new scientific age, ‘mechanical necessity’. Exploding the ‘occult natures’ of older metaphysics, new philosophers like Galileo, Descartes, and Boyle, sought to ground the intelligibility of nature on the notion of mechanism which produces observable phenomena by figure, size, and motion of minute extended bodies. The ‘mechanical necessity’, which was modelled on the clockwork whose hands were moved by the workings of the inside springs and wheels, had become the real structuring principle of nature. Berkeley, however, intended to replace mechanical necessity with the new paradigm of linguistic convention, which puts forward the notion of the contingent connections established by custom or stipulated rules. He does not reject mechanism altogether, but rather tries to nullify its claim of causal productivity and thereby paves the way for his own linguistic paradigm.

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19 Brook, Berkeley’s Philosophy of Science, p.18: ‘The crux of the language metaphor ... is to express the contingent nature of the relations between kinds of phenomena; relations that are ultimately formulated as “natural laws”’. 

35
... a particular size, figure, motion and disposition of parts are necessary, though not absolutely to the
producing any effect, yet to the producing it according to the standing mechanical Laws of Nature. Thus,
for instance, it cannot be denied that God ... might ... cause all the motions on the dial-plate of a watch,
though no body had ever made the movements, and put them in it: but yet if he will act agreeably to the
rules of mechanism, ... it is necessary that those actions of the watchmaker, whereby he makes the
movements and rightly adjusts them, precede the production of the aforesaid motions. (PHK.62)

In this passage, it is clearly seen that the notion of ‘mechanism’ is deprived of its ontological import
and made equivalent to ‘the mechanical laws’ or ‘the rules of mechanism’. Though it might appear
that there is ‘necessary connection’ between operations of the clock’s inner parts and the movement
of the hand, the connection is actually contingent; it is necessary only on the supposition that God
acts by ‘the rules of mechanism’, and He can, when a miracle is necessary, occasionally suspend
application of the rules. Thus, on Berkeley’s account, the mechanical rules are, as it were,
something detached and abstracted, having no real ontological ground in machines as concrete
things in nature. Thus having made natural mechanism inefficacious (or ‘anaesthetized’), it was
easy for Berkeley to transform it into a system of ‘signs’. In section 65, he goes on to remark:

... the reason why ideas are formed into machines, that is, artificial and regular combinations, is the
same with that for combining letters into words. That a few original ideas may be made to signify a
great number of effects and actions, it is necessary they be variously combined together: and to the end
their use be permanent and universal, these combinations must be made by rule, and with wise
contrivance.

In section 60, Berkeley was confronting the question, how can he make sense of the existence of
'the clockwork of nature' if the inner structure of the machine is not so 'powerful or operative' as to have 'necessary connection' with its observable effects? By the time he finishes his answer, he urges us to conceive all the fine contrivances of natural machinery 'only as marks or signs for our information', which are 'instituted by the Author of Nature' (PHK.66). According to Berkeley's new conception of nature as structured language-like, there is no reason or ground on the side of physical things why they must behave as they do, since the connection between their inner contrivance and outward behaviours is just arbitrary institution of God as 'the Author of Nature'; this is just analogous to that there is no intrinsic reason for the way 'letters' are combined into one 'word' to have such and such meaning, since the connection between word and meaning derives from our decision as the inventor of language.

But Berkeley's functionalist conception of the natural world, modelled on 'language', would seem to render 'the laws of nature' flimsy and unsteady: to use Leibniz's phrase in criticism of Malebranche's occasionalism, it might appear to turn the course of nature into 'continual miracle'.

I have noted that Berkeley frequently refers to the laws as 'steady', 'fixed', and 'constant'. But if the stability he attributes to the laws of nature is just analogous to the stability of linguistic convention, can we regard it as sufficiently answering to our expectation that they are reliable guide for our actions in the world? Here we may be inclined to conceive of the regularity of nature as having more solid and durable foundation in the nature or essence of things themselves. Berkeley, however, wants to conceive the whole natural process as 'the immediate effects of a free spirit' (PHK.57). But at the same time, he thinks that God's wisdom and goodness sufficiently guarantee the semi-permanent stability of the laws of nature he had once established: it is always easy for God to perform a miracle at any point of the course of nature by suspension of the regular connections of ideas, but he generally intends to exhibit in the works of nature 'plain indications of [his] wisdom

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and beneficence . . ., rather than to astonish us into a belief of his being by anomalous and surprising events’ (PHK.63). The analogy of nature with language, which assimilates the laws of nature to the conventional rules of language, do sufficient justice to our sense of the steady lawful order of nature. In a passage of the Three Dialogues, indeed, Berkeley has Philonous say: ‘So fixed, so immutable are the laws by which the unseen Author of Nature actuates the universe’ (DHP:210).

2. ‘Intuition’ and ‘foresight’: two ways of knowing nature

(1) Knowledge of ‘ideas’

In the previous section, I have identified two basic strata which constitute the natural world as Berkeley conceives it: ‘ideas’ and ‘the laws of nature’. The chief task of this section is to explore two distinct type of knowledge which correspond to these two strata of physical reality as it is presented in the Principles and the Three Dialogues. But before looking at the text, it will be useful, by way of making provision, to give formulations of ‘knowledge of ideas’ and ‘knowledge of laws’. For convenience of reference, I will call the one intuitive and the other predictive.

**Intuitive knowledge:**

The objects of intuitive knowledge are particular sensible qualities qua ideas of sense, which are present to the mind’s awareness, separately one after another or several at once, in sense perception through the five senses, or sensible qualities qua ideas of imagination, which are those ideas we sense-perceived in the past experience and call up to perceptual awareness by imaginative exercise; the way we have this knowledge is by simple perceptual apprehension, through which we capture the whole being of what is present before the mind’s awareness.
**Predictive knowledge:**

The objects of predictive knowledge are *connections* of ideas, or the relations of *signs with the signified*; the way we have this knowledge is not by perceptual apprehension of the actually present, but by acquiring the *ability* of using the present ideas of sense as *signs* of the non-present ideas to be perceived in the subsequent course of sensory experience – the ability of judging the non-present by the present, on the basis of the observation of their lawful connections, so that by such judgement the mind would extend cognitive compass from the present to the non-present objects.

In the above formulation, two types of knowledge are contrasted to each other with respect to their objects and modes of knowing. As to difference in objects, intuitive knowledge involves only one kind of element, the present idea (either of sense or of imagination); whereas predictive knowledge involves three kinds of element, namely, the present idea (*sign*), the non-present idea (the *signified*), and their connections by which the present idea functions as a sign. As to the modes of knowing, intuitive knowledge just consists in *perception*, but predictive knowledge is the *ability of judgement* (or *inference*) about signs. On the level of perceptual knowledge which Berkeley specifies as ‘mediate perception’, the mental function to work out the non-present from the present in predictive knowledge is called ‘suggestion’ rather than ‘judgement’.

Now let us turn to the text of the *Principles* to see how Berkeley discusses these two types of knowledge. The ‘survey of the objects of human knowledge’ in section 1 of the *Principles* unambiguously identifies ‘ideas of sense’ and ‘ideas of imagination’ as objects we know. The objects of knowledge are ‘either ideas actually imprinted on the senses, … [or] ideas formed by help of memory and imagination, either compounding, dividing, or barely representing those originally perceived in the aforesaid ways’. Since the chief concern of the first half of the *Principles*, sections 1-84, lies in the ontological question about the existence of the objects of sense, arguing
that sensible things cannot exist independently of the mind’s perception, the epistemological question how ‘ideas’ as objects of perception are to be known is kept out of sight for the while. But in the second half where Berkeley comes to draw positive consequences of his esse-percipi thesis with regard to human knowledge, it turns out that he considers the relation between perception and knowledge to be straightforward: according to him, just perceiving ‘ideas imprinted on the senses’, without any extra mental processing of them, amounts to knowledge of them.

Berkeley clearly holds that perception is a cognitive (or epistemic) achievement. Simple perceptual apprehension of an object essentially involves knowing it, even before any judgement or inference is made about it. Indeed, it is not just knowing, but knowing in a very strong sense. For, as he states in section 87, knowledge of ideas by simple perception constitute perfect knowledge.

Colour, figure, motion, extension and the like, considered only as so many sensations in the mind, are perfectly known, there being nothing in them which is not perceived.

This claim about ‘perfect knowledge’ is not confined to the Principles. It is repeated in the Three Dialogues, where we find the following passage near the end of the first dialogue (DHP:206).

PHILONOUS. ... Do you not perfectly know your own ideas?

HYLAS. I know them perfectly; since what I do not perceive or know, can be no part of my idea.

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This point is not uncontroversial. Some scholars, such as Winkler and Stoneham, hold that for Berkeley simple perceptual apprehension by sense (i.e. immediate perception) is cognitive; yet others, such as Pitcher and Pappas, suggest that Berkeley conceives it as non-epistemic. Kenneth P. Winkler, Berkeley: An Interpretation, pp.153-4; Tom Stoneham, Berkeley’s World: An Examination of the Three Dialogues, Oxford, 2002, pp.88-92; George Pappas, ‘Berkeley and Scepticism’, Philosophy and Phenomenological Research 59, 1999, pp.133-49. I agree with Winkler and Stoneham that Berkeley’s texts clearly point to the interpretation that Berkeley considers simple perception to be a cognitive relation.
As it can be seen in these two texts, what Berkeley has in mind by ‘perfect knowledge’ is completeness. We may clarify this concept of cognitive completeness in regard to two aspects: transparency and infallibility. When we capture sensible qualities qua ‘ideas’ as they are presented to perceptual awareness, there is nothing more to know about them that is left out from perception. All that constitutes the object of knowledge is right there, in full accessibility, before the mind’s awareness. By virtue of this perfect transparency of the object, there is no possibility that knowledge we have of an idea by simple perceptual apprehension is subject to revision by a new discovery in subsequent experience: if we perceive x as F, it will never happen that we later come to perceive it also as G (supposing that F and G are not identical).

As to the characterization of infallibility attributed to knowledge of ideas, Berkeley thinks it is entailed by the combination of the transparency thesis and the rejection of the representationalist view of perception. In section 87 quoted above, the claim of transparency that ‘there is nothing in [ideas] which is not perceived’ is first put forward, and then this claim is followed by the remark,

But if [ideas] are looked on as notes or images, referred to things or archetypes existing without the mind, then are we involved all in scepticism. We see only the appearances, and not the real qualities of things. What may be the extension, figure, or motion of any thing really and absolutely, or in it self, it is impossible for us to know, but only the proportion or the relation they bear to our senses.

In order to avoid sceptical attack on our knowledge-claim, it is not sufficient that the mind’s awareness captures ‘extension, figure, motion’, qua ideas, as a whole. For, if those ideas are not distinct beings standing on its own but are representative beings which are referred to a certain external standard, then the truth of the contents as we presently perceive in ideas is not determined within that perception itself; it is always subject to falsification by the external standard. And it is
the possibility of this gap that sceptics highlight to overturn our knowledge-claim about reality. But Berkeley rejects the thesis of ‘twofold existence of the objects of sense’. Rejecting the dichotomy of ‘ideas’ and ‘things’, he maintains necessary agreement between the ‘intelligible’ and the ‘real’. When we perceive an idea, what it appears to be to us and what it really is never come apart. Thus, ‘knowledge of ideas’ is infallible. When we perceive the content of an idea as such and such, we immediately attain to the truth about that object straightway just by perceiving it and will never be corrected later by extra information coming from outside of the present perception.

‘Knowledge of ideas’ by simple perceptual apprehension thus constitutes ‘perfect knowledge’, and ‘perfection’ (i.e. completeness) of this knowledge consists in the transparency of the object of cognition (there is nothing more in it yet to be discovered) and the infallibility of cognitive apprehension about the object (there is no possibility of mistaking it). But now questions may be raised concerning the nature of this knowledge. Berkeley attributes transparency and infallibility to perception of ideas, but this would seem to presuppose the use of certain concepts with regard to the perceived objects. The transparency thesis claims that the object always present themselves in totality before the perceiving mind. But how, it may be asked, can the mind know the total presence of the object without judging it as existing or as having such and such qualities? And according to the infallibility thesis, the mind cannot be mistaken about the perceived object’s being F, but how can the mind know that the object is F, without having the concept F (as opposed to being not-F, and as having its proper place in a certain ‘conceptual network’)? But once it is acknowledged that the identification of an object as such and such in awareness involves application of concepts to it, errors should always be possible through misapplication of concepts, such as judging it to be G when it really is F. Even if it is granted that an object can be present to awareness, non-epistemically, without judgements or conceptual commitments made by the mind, such bare presence would never amount to ‘knowledge’. Knowledge necessarily involves discrimination of the presented
objects of sense through judgment, and this discrimination is always theoretically committed.

To the modern mind which is fairly familiar with the distinction between intuition and concept, the dualism of matter and form of thought, these objections cannot but appear compelling. But we should always remember that Berkeley had been working out his position in the age before Kantian distinction between sensory manifold of intuition and conceptual schematic of understanding was introduced to epistemology. For Berkeley, unlike for the post-Kantian philosophers, it was not obvious that the object given in perception can be identified and known only after the application of certain descriptive concepts. In agreement with other philosophers of the early modern age, he believed in the unmediated intuition of objects manifesting themselves before the ‘understanding’, prior to the occurrence of judgemental function ascribed to the ‘will’. Malebranche observed that ‘the understanding never judges since it does nothing but perceive’; that ‘it is the will alone that really judges by assenting to, and voluntarily remaining with, what the understanding represents to it, and that thus it alone plunges us into error’.

Locke famously used the ‘mirror’ analogy in his description of the understanding: ‘simple ideas, when offered to the mind, the understanding can no more refuse to have, nor alter when they are imprinted, nor blot them out and make new ones itself, than a mirror can refuse, alter, or obliterate the images or ideas which the objects set before it do therein produce’. Seen from such pre-Kantian perspective, it is not surprising that Berkeley holds that the object is present to the understanding as full-fledged and fully knowable: ideas of sense are not indeterminate mass of sensory impression which awaits determination from conceptual judgements imposed on it and thereby made knowable; they have discernible contents in themselves and the understanding just captures those contents as they are present to it.

Berkeley’s position has been compared with Russell’s account of ‘knowledge by acquaintance’ as distinguished from ‘knowledge by description’. According to Russell, acquaintance is a simple

22 Malebranche, The Search after Truth, Book 1, chapter 2, section 1 (L.O.7).
23 Locke, Essay, Book 2, chapter 1, section 25.
cognitive relation between subject and object without any mental operations like judgement occurring in the subject. What the concept of acquaintance expresses is nothing more than the fact of the object’s bare presentation to the perceiving subject, as Russell put it: ‘to say that S has acquaintance with O is essentially the same thing as to say that O is presented to S’ 24. As far as Berkeley thinks of knowledge of ideas by perceptual apprehension as just derived from their presentation to the mind, his affinity to Russell’s ‘knowledge by acquaintance’ is conspicuous. And he also agrees with Russell in that acquaintance with an object amounts to infallible knowledge. But Russell later replaced ‘acquaintance’ by ‘noticing’ and thereby introduced a mental operation mediating the relation of subject and object to his account of direct perceptual knowledge. While ‘acquaintance’ does not admit of degrees, ‘noticing’ does; thus when we notice an object, we are ‘isolating it from the sensible environment’. And this led Russell to weaken the claim of immediate knowledge by bare presentation: ‘the most immediate knowing of which we have experience involves sensible presence plus something more .... What is wanted may be called “attention”; this is partly a sharpening of the appropriate sense-organs, partly an emotional reaction’25. This introduces acts of knowing which intervene between the knowing subject and what is known, and implies the denial of the transparency thesis about objects of perception.

However, Berkeley’s view of ‘knowledge of idea’ may actually be interpreted in line with this knowledge by ‘noticing’ rather than knowledge by ‘acquaintance’. In section 22 of the Introduction to the Principles, pointing to the proper method for true knowledge, he advises the reader to be alert to ‘imposition of words’ on the understanding and concentrate our ‘attention’ on ideas.

The objects I consider, I clearly and adequately know. I cannot be deceived in thinking I have an idea which I have not. ... To discern the agreements or disagreements there are between my ideas, to see

24 Stoneham, op. cit., p.88.
In this passage, Berkeley claims that ideas are known 'clearly and adequately', but the implication of the last sentence seems that in order to attain this clear and adequate knowledge of ideas we need to attentively perceive them. It is not sufficient, then, in order for us to have 'perfect knowledge' of an idea that it is just present to the mind. The bare presence of an idea does not necessarily amount to transparent perception of it: all that constitutes the object may be right there as fully accessible, but it is not yet fully grasped by the mind's awareness. It is only through our effort of attention that an idea is made 'perfectly known'. To be sure, Berkeley's 'attentive perception' is not exactly Russelian 'noticing', but the point here is that it requires, like Russell's 'noticing', 'sensible presence plus something more' and thereby brings in the worry that some features of the present object may be always left out of the mind's awareness. Even if it is granted that attentive perception, if it is carried out to the ultimate point, would adequately capture ideas as they are; how can we be assured that attention is paid to the present object sufficiently to reveal its whole being? Berkeley's meaning in the above passage might be just that the removal of 'words' from the present scene of perception will immediately put us in the state of attentiveness which is sufficient to have 'clear and adequate' knowledge of ideas. Then his position about 'knowledge of ideas' is after all akin to Russell's 'knowledge by acquaintance'. But the role of 'attention' in Berkeley's account of knowledge is difficult to figure out, since he says little about it in the texts of his works.

The appeal to simple apprehension of sensory contents considered as 'the given', in the attempt to construct the whole edifice of empirical knowledge out of the fundamental 'sense-data', received favourable light in the early twentieth century, but it is now generally in disrepute after massive criticisms. Most of the contemporary philosophers tend to repudiate the notion of bare sense-data
without conceptual cloths, holding that the sense-data theory represents ‘the myth of the given’. Berkeley’s atomistic sensationalism as seen above is generally regarded as anticipating the later sense-data theory, and in that connection has been roundly criticized. But it would be worth noting that Berkeley’s conception of knowledge of ideas as ‘perfect’, unlike its twentieth-century ‘foundationalist’ counterparts, is developed in close connection with theological motifs. Berkeley’s insistence on ‘perfect knowledge’ about present sensible ideas can be seen as one of the many attempts among early modern philosophers to elaborate the doctrine of ‘man as made in the image of God’ in theories of knowledge. And correlated with this, there is no doubt that Berkeley intended to vindicate the God-given faculties of man in opposition to the blame of their natural weakness made by sceptics: he refers to ‘the wonted, indulgent methods of Providence’ in section 3 of the Introduction to the Principles. The connection of Berkeley’s account of ‘knowledge of ideas’ with this latter motif will be discussed in detail in the next chapter.

(2) Knowledge of ‘the laws of nature’

The type of knowledge which we have explored so far corresponds to ‘intuitive knowledge’ as I formulated in the beginning of this section. As it was noted, intuitive knowledge is concerned with only one kind of element as its object, namely, the ideas present to the mind (one or several at once) and this knowledge is attained by simple perceptual apprehension of ideas. Now we are going to

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26 Edward Craig argued, through an extensive survey of philosophers ranging from Galileo through to the Cambridge Platonists, that the Genesis doctrine of man as ‘the image of God’ (which he calls the ‘Similarity Thesis’) had an enormous influence over philosophical thinking on human knowledge and action in the seventeenth and early eighteenth century. According to Craig, Berkeley’s claim about perfect knowledge of physical reality by ‘ideas’ can be read as developing one version of the ‘Similarity Thesis’, which he tries to identify in the epistemological doctrines of Galileo, Spinoza, Leibniz, Malebranche, et al. Craig calls Berkeley’s version the perceptual model, as opposed to the ‘mathematical model’ of Galileo and others. See Edward Craig, The Mind of God and the Works of Man, Oxford, 1987, pp.32-5.
explore Berkeley’s treatment of another type of knowledge, which I called ‘predictive knowledge’, by looking at the texts of the *Principles* and the *Three Dialogues*. As we will see, this second type of knowledge is properly to be considered to constitute ‘knowledge of the laws of nature’ as distinguished from ‘knowledge of ideas’. To prevent confusions, the scope of ‘knowledge of ideas’, strictly speaking, should be confined to what I called ‘intuitive knowledge’. But in the *Principles* and the *Three Dialogues*, Berkeley himself is far from careful about the distinction between these two kinds of knowledge. Since ideas constitute one category of ‘thing or being’ (PHK.89), knowing ideas is knowing things. Knowledge of the laws of nature, on the other hand, does not seem to belong to knowledge about things; it is knowledge about the relations of things. And as such, knowledge of the laws of nature has a distinctive structure which would be obscured if it was put under the broad title of ‘knowledge of ideas’. As we will see in the next section, it is only as late as in the second edition of the *Principles* that Berkeley makes explicit distinction between two categories of knowledge, ‘knowledge of relations’ and ‘knowledge of ideas’.

In the previous section, we looked at the passage of section 30 of the *Principles* where Berkeley introduces the laws of nature which he regards as the structuring principle of physical reality underlying ‘ideas of sense’: ‘the set rules or established methods, wherein the mind we depend on excites in us the ideas of sense, are called the Laws of Nature’. As Berkeley goes on to observe,

… these we learn by experience, which teaches us that such and such ideas are attended with such and such other ideas, in the ordinary course of things. This gives us a sort of foresight, which enables us to regulate our actions for the benefit of life. … in general, that to obtain such or such ends, such or such means are conducive, all this we know, not by discovering any necessary connexion between our ideas, but only by the observation of the settled laws of Nature. (PHK.30-31)
As we saw in the second half of the preceding section, Berkeley repudiates the ordinary belief in physical causal agency and the notion of ‘necessary connection’ entertained by mechanist philosophers. In place of physical cause and mechanical necessity, he introduces the new notion of ‘natural sign’ which God instituted to maintain the connection between sensible ideas in discernible regular patterns. In the Berkeleian view of the world, all the physical orders are thus transformed into the semiotic relations of ‘a mark or sign with the thing signified’ (PHK.65), and we can learn the sign-signified connections of nature by experience and observation. The special emphasis Berkeley puts in putting forward this new conception of nature as composed of ‘natural signs’ is on the pragmatic significance of knowing natural orders. As it can be seen in the above passage, ‘foresight’ becomes the key concept in his account of knowledge of ‘the laws of nature’. In Berkeley’s natural philosophy, knowledge of laws is chiefly conceived in terms of the ability of acting in the world with predictive judgement. The mechanical structure of the inner parts of bodies, too, is not to be taken as the cause of their observable features but as ‘natural signs’ by which we are instructed about ‘what methods are proper to be taken, for the exciting such and such ideas’ (PHK.65). Hence the proper task of natural philosophy is defined to be ‘the searching after, and endeavouring to understand those signs instituted by the Author of Nature’ (PHK.67).

Now it is clear that Berkeley’s account of knowledge of laws constructed on his theory of ‘natural signs’ corresponds to what I formulated ‘predictive knowledge’ at the start of this section. And it may well seem that this predictive knowledge of laws is very different from that type of knowledge I called ‘intuitive’ in that it essentially involves interpretation of signs: we not only know an idea (or several ideas at once) which is (are) present by perceptual apprehension but know it as a sign of another idea which follows the present one ‘in the ordinary course of things’. Whether the idea signified by the present idea is to be perceivable in the near or remote future, it is not part of the presently perceived object but is only judged about on the basis of the lawful
connection learned through the past experience. This point is particularly clear in the case of knowing the lawful connection of ideas which is vulgarly conceived as physical causality. When Berkeley thinks about the sign-signified relation between (visual idea of) "fire" and (tactual idea of) "warmth" or "pain", between "sowing in the spring" and "reaping in the harvest" (PHK.31/65), there is little danger of assimilating knowing "natural signs" to knowing "ideas". And in discussion of this case of knowing laws, Berkeley clearly has the pragmatic significance of knowledge in view, using such terms as "foresight" or "forewarning" (PHK.31/65). But Berkeley's account of knowledge of laws is not restricted to the case of physical causality. It is also relevant to his account of knowledge of physical things like apples and trees considered as "collections of ideas". The problem about his account in this connection, however, is that there is no text where Berkeley analyses knowledge of physical things by application of the concept of "natural signs". Accordingly, it is not clear how he actually conceived the structure of knowledge of physical things.

Berkeley's account of knowledge of physical things is developed in discussion of mediate perception, and we are now going to see how knowledge of "ideas" and knowledge of "laws" tend to be amalgamated in this context. In the preceding subsection, I used the term "simple perceptual apprehension" to express the way by which the mind attains intuitive knowledge of the objects presented to it. This corresponds to what Berkeley calls "immediate perception" as distinguished from "mediate perception". In the Three Dialogues, Berkeley tries to isolate immediate perception from other modes of non-immediate cognitive apprehension in order to define "sensible things" taken in strict sense. Sensible things, strictly understood, are only those which are perceived immediately by the senses. Now immediate perception should be understood in contradistinction to "inference" on the one hand, and to "mediate perception" on the other. When we see various colours in the sky, we may infer the cause of the diversity of colours; but while colours are perceived by sense, the cause of colours are not: inference of the cause is the function of reason. Likewise, when
we read a book, we perceive the letters, and by mediation of the letters varieties of meaning are suggested to our mind; but meaning is not perceived by the senses, for it is only letters that are objects of sense perception (DHP.174-5). Immediate perception, then, is to be distinguished from both inference by reason and mediate perception by suggestion; hence sensible things in strict sense are defined as objects of immediate perception so understood.

The point which is relevant to our discussion here is about the nature of knowledge by mediate perception. We saw that intuitive knowledge by simple perceptual apprehension amounted to ‘perfect knowledge’: it is characterized by the transparency of the object of cognition (there is nothing more in it yet to be discovered) and the infallibility in cognitive apprehension of the object (there is no possibility of mistaking it). The objects of this knowledge are the particular ideas which are present to each sense or to imagination, as are given in section 1 of the Principles. In the Three Dialogues, the same point is suggested by Philonous: ‘whether we immediately perceive by sight anything beside light, and colours, and figures: or by hearing, any thing but sounds: by the palate, anything beside tastes: by the smell, beside odours; or by the touch, more than tangible qualities’ (DHP.175). Now for clarification of the nature of knowledge by mediate perception, let us turn to the passage where Philonous illustrates mediate perception by example of hearing a coach.

For instance, when I hear a coach drive along the streets, immediately I perceive only the sound; but from the experience I have had that such a sound is connected with a coach, I am said to hear the coach. It is nevertheless evident, that in truth and strictness, nothing can be heard but sound: and the coach is not then properly perceived by sense, but suggested from experience. (DHP.204)

Here we need to be clear about what object we know by mediate perception. The answer would naturally seem to be ‘a coach’. But what is a ‘coach’ which is supposed to be meditately perceived?
In section 1 of the *Principles*, Berkeley observed that an apple is a ‘collection of ideas’: ‘a certain colour, taste, smell, figure and consistence having been observed to go together, are accounted one distinct thing, signified by the name *apple*’. Similarly, a coach should be a collection of such ideas as certain colours, hardness, figure, size, sounds, etc., which have been ‘observed to go together’ and thus are ‘accounted as one distinct thing’. The structure of mediate perception of a coach, then, seems to be this: of those sensible ideas which we observed to go together in the past experience, one component idea – ‘sound’, in the above example – is *immediately* perceived; and by means of this auditory idea which is presently and immediately perceived, a collection of ideas which by virtue of experience we have been accustomed to associate with the sound we now hear and to which we apply the name ‘coach’, is *mediate*ly perceived; the function which brings about such transference of perception from the immediate to the mediate objects, is *suggestion*. Since suggestion depends on the past experience of the perceiver, the mediately perceived coach thus suggested to the perceiver is as many ideas – a limited part of the whole collection – as would be sufficient for each perceiver to distinguish a coach from other sensible things.

Now there is an ambiguity in Berkeley’s account of mediate perception: which of the two types of knowledge – ‘intuitive’ and ‘predictive’ – mediate perception of a coach belongs to? In terms of the way the knowledge is attained, mediate perception of a coach is ‘predictive’ knowledge. For, the immediate object of this knowledge is sound which functions as a ‘sign’, and the mediate object, a coach, is a ‘thing signified’ by the sound; and the judgemental function, ‘suggestion’, interprets sound on the basis of the regular connection observed between them. But at the same time, since Berkeley considers mediate perception to be a kind of *perception*, and since this perception is aiming at a *particular* object (e.g. *the* coach now passing on the street when we hear the sound), knowledge by mediate perception looks like intuitive knowledge as well. To be sure, in mediate perception of a coach, all of the component ideas is not *actually present* to the mind’s awareness –
in the ‘coach’ example, only a series of sound is presented to sense perception. But Berkeley thinks the object of mediate perception, though not actually present to the senses, is still present to perceptual awareness of non-sensory kind. In the Three Dialogues where mediate perception is discussed, Berkeley gives another example of mediately seeing a red-hot bar of iron, and observes: ‘the solidity and heat are not the objects of sight, but suggested to the imagination by the colour and figure, which are properly perceived by that sense’ (DHP.204; my italics). Ideas that are mediately perceived by ‘suggestion’ are present to perceptual awareness not as the object of sense perception but as the object of imaginative perception.

But this reading of Berkeley’s account of mediate perception, which reduces it to intuitive type of knowledge, appears problematic\textsuperscript{27}. For the object which is aimed at by mediate perception cannot be a collection of imagined ideas: it is a collection of ideas which are actually perceivable by sense. When we hear a coach running on the street, the object we mediately perceive is a real coach which we will see and touch if we go out to the street. We may perhaps imagine that the coach passing by is brown and square, but it may turn out that it actually is white and round-figured. Thus

\textsuperscript{27} In Berkeley’s Revolution in Vision (Ithaca: Cornell University Press, 1990), Margaret Atherton rejects this interpretation of mediate perception by ‘suggestion’ when she explains Berkeley’s point of using the language analogy: ‘of course, understanding what the words mean is not a matter of hearing noise and then, undergoing, even in imagination, a set of experiences that constitute the meaning. You hear the words as meaningful’ (p.104). In the note added to this remark, Atherton acknowledges that ‘one undoubted difficulty readers face with Berkeley’s language analogy is that the phenomena he refers to [i.e. hearing words as meaningful], though very familiar, are not taken to be particularly well understood’. Atherton seems to be saying that to understand the meaning of a word is not to perceive two distinct items, the word and the meaning, one after another, but just to perceive one item, the word, in a certain way, that is, meaningfully; and that the experience of seeing as meaningful perception (i.e. seeing visual cues with spatial signification) does not involve perceiving tactual ideas as objects of imagination. But Atherton’s interpretation leaves the question about the reality of mediately perceived objects unsettled, namely, about whether what she calls ‘perception (of visual cues) as meaningful’ amounts to the perception of real space (or properties actually located at a distance). In the case of ‘hearing a word as meaningful’, the question about the real existence of what is meant by the word is irrelevant for understanding its meaning. But in the case of visual perception, it always matters whether there really are space and properties which are suggested by visual cues. In this paragraph, I argue on the ground different from Atherton’s.
mediate perception is not to be reduced to a form of intuitive knowledge in which all of the component ideas constituting a physical object is actually present to the mind's imagination by 'suggestion'. Mediate perception may well involve perceiving ideas of sense and of imagination, but the target object of mediate perception is those ideas of sense which are to be collected into one thing in 'the ordinary course of things'. Mediate perception, then, is different from intuitive knowledge – immediate perception – in that there are parts of the target object which are not perceived: it aims at the non-present object through the present object which functions as a 'sign' of the non-present. Berkeley conceives mediate perception as a kind of perception, and his talk about 'suggestion to imagination' gives impression that he assimilates it to intuitive knowledge. But the physical object which is mediate perceived is not a collection of 'ideas of imagination', as the 'pain' which is signified by 'fire' is not the imagined pain currently present to awareness by 'suggestion'. This being observed, however, it seems probable after all that Berkeley never reached a clear view about the nature of mediate perception of physical things. As we will see in the next chapter, he tends to deal with mediate perception of physical things as if it involved nothing more than perception of 'ideas' and thus is a species of 'intuitive knowledge'. It is only when he came to consider the problem of perceptual error that he explicitly recognized that perceiving physical

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28 Because of this fundamental ambiguity in Berkeley's analysis of the perception of ordinary physical things, there has been two competing interpretations in the literature. George Pappas, on the one hand, argued that Berkeley conceives perception of a physical thing as non-epistemic immediate perception: we immediately perceive a physical thing (a 'collection of ideas') by perceiving an idea (or several ideas) which is present to the mind and which is a member of the collection. According to this interpretation, perception of a physical thing is immediate but does not amount to knowledge. Margaret Atherton, on the other hand, holds (following Pitcher) that for Berkeley, perception of a physical thing is mediate: it involves the mental activity of 'suggestion' which is triggered by immediate perception of a component idea of the collection. As it was stated in the previous note, Atherton takes 'mediate perception by suggestion' as occurring in the same way we hear words as meaningful without awareness of any imagined items. George Pappas, 'Berkeley, Perception, and Common Sense', in Berkeley: Critical and Interpretive Essays, (ed.) C.M. Turbayne, Minneapolis, 1982; Margaret Atherton, 'The Objects of Immediate Perception', in New Interpretations of Berkeley's Thought, Stephen H. Daniel (ed.), New York: Humanity Books, 2008, pp.107-119, esp.p.112. See also Kenneth Winkler, Berkeley: An Interpretation, pp.149-161.
things involved knowledge of ‘the laws of nature’.

3. ‘Relations’: the third province of human knowledge

In the *Principles*, Berkeley conceives his system of the world as consisting of two kinds of ‘being’.

As it is stated in section 89: ‘*Thing or being* is the most general name of all, it comprehends under it two kinds entirely distinct and heterogeneous … to wit, *spirits* and *ideas*’. Accordingly, he recognizes only two distinct categories in his division of the objects of human knowledge:

> From the principles we have laid down, it follows, human knowledge may naturally be reduced to two heads, that of *ideas*, and that of *spirits*. (PHK.86)

When he published the second edition twenty four years later, however, he came to see this broad bisection of being and knowledge as inexact and added yet another to these two categories. Although the division of knowledge in ‘two heads’ was left intact, he inserted a long supplementary passage in section 89, where he newly introduced *notional* knowledge whose objects include ‘relations’ as well as ‘minds’. Both of them are distinguishable from knowledge of ‘idea’.

> We may be said to have some knowledge or notion of our own minds, of spirits and active beings, whereof in a strict sense we have not ideas. In like manner we know and have a notion of relations between things or ideas, which relations are distinct from the ideas or things related, in as much as the latter may be perceived without our perceiving the former. To me it seems that ideas, spirits and relations are all in their respective kinds, the object of human knowledge and subject of discourse: and that the term *idea* would be improperly extended to signify every thing we know or have any notion of.
Now my concern here is only to explore the implication of what Berkeley has to say about ‘relations’ in this passage. According to this addition, ‘relations’, as distinguished from ‘ideas’ and ‘spirits’, constitute the third province of human knowledge, ‘the object of knowledge and subject of discourse’ *in its own kind*. And concerning this newly introduced kind of objects, it is observed that to know relations is not, properly speaking, to have an idea but to have a ‘notion’ of them. Such special attention to ‘relations’ and their distinction from ‘ideas’ is quite remarkable. This passage clearly shows that the category of ‘relation’ has come to have an important place in Berkeley’s system of knowledge by the time he published the second edition.

Berkeley’s later introduction of ‘relation’ to his system of human knowledge has not received sufficient attention in the recent literature. The passage of section 89 added in the second edition has been occasionally discussed by commentators. But their attention hitherto tended to be drawn to Berkeley’s technical use of the term ‘notion’, and if Berkeley’s mention of ‘relation’ here has ever been taken notice of, it was only briefly touched on in the context of discussion on the possible change in his theory of spirits. My reading of section 89, in contrast to this standard approach, locates ‘relation’ in the context of his theory of knowledge of nature. This reading is supported by another coordinating change in section 101 about object of scientific knowledge in the same edition.

As I have noted before, this section which starts Berkeley’s critique of natural science and mathematics up to section 134, originally opened with this statement: ‘The two great provinces of speculative science, conversant about ideas received from sense, are natural philosophy and...

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mathematics'. In the second edition, this statement undergoes a slight but important alteration:

The two great provinces of speculative science, conversant about ideas received from sense and their relations, are natural philosophy and mathematics. (The first italics added)

From this correction, we see that Berkeley came to hold that the occupation of natural philosophy as well as of mathematics can be more adequately captured if we understand them as studying sensible ideas and their relations rather than just ‘ideas received from sense’. The supplementary remark on ‘relations’ in the division of human knowledge in section 89, therefore, is clearly linked with his thought on the nature of mathematical and natural science, and reflects his considered view on scientific knowledge. (Concerning how the ‘relations’ are considered to be the object of mathematics – arithmetic, in particular – by Berkeley, I will have occasion to deal with it extensively later in section 4 of chapter 3).

The linkage between Berkeley’s introduction of ‘relations’ in the second edition and his theory of knowledge of nature has been generally neglected in the literature. While commentators’ attention has been drawn to the technical use of ‘notion’, what appears to me really striking is rather that Berkeley now regards ‘relations’ as constituting in its own right a distinct category of the object known, which is reducible neither to knowledge of ‘ideas’ nor to that of ‘spirits’. In the preceding section, I have pointed out an ambiguity about knowledge of ‘the laws of nature’ in the first edition of the Principles. But we see this ambiguity is resolved in the second edition, for in section 89 quoted above, Berkeley states that ‘relations are distinct from the ideas or things related, in as much as the latter may be perceived without our perceiving the former’ (my italics). This brief sentence shows his clear recognition of the difference between the mind’s perceiving an orderly series of ideas and its conceiving of them as related in an orderly way. To know ‘relations’ of ideas, then, is
an achievement distinct from perception of the ideas related, and the revision of section 101 about
the object of science can be taken as suggesting that science aims at identifying the relations which
are not immediately apprehensible in perceptual awareness. In natural science, this would mean
that it aims at advancement in our knowledge of the ‘relations’ which holds between observable
ideas by improving our understanding of ‘the laws of nature’.

It may seem, however, that since Berkeley’s mention of ‘relation’ is so cryptic and obscure that
any attempt to see a significant development in it leads to an exaggeration. Thus, Luce had this
dismissive remark on the second-edition revision about ‘relations’: ‘Berkeley’s introduction of
‘relations’ alongside of spirit and ideas was half-hearted, not sustained’. But it should be noted that
Berkeley’s concern for the place of ‘relations’ in his theory of knowledge can be traced back to his
unpublished thoughts in the early notebooks. In one remarkable entry, we see him distinguishing
the study of ‘notions’ [i.e. ideas] ‘absolutely in themselves’ and the study of their ‘relations’.

The Vast, Wide-spread, Universal Cause of our Mistakes. Is that we do not consider our own notions, I
mean consider them in them selves, fix, settle & determine them. We regard them with relation to each
other only. In short we are much out in study the relations of things before we Study them absolutely
& in themselves. Thus we study to find out the Relations of figures to one another, the Relations also
of Number, without Endeavouring rightly to understand the Nature of Extension and Number in
themselves This we think is of no concern of no difficulty but if I mistake not tis of the last Importance.

As it can be seen, Berkeley’s attitude to the significance of ‘relations’ in the notebooks is far from

we will see later, Luce has another view about Berkeleian ‘relations’, according to which Berkeley
was clear about ‘knowledge of relations’ from the earliest stage of his philosophical career.
31 The term ‘notion’ in this entry is just synonymous with ‘idea’.
enthusiastic. Here Berkeley urges us to concentrate on ideas themselves and ‘fix, settle & determine them’ before looking out for their relations. In a later entry, his attitude to ‘relations’ becomes even more hostile, talking about them quite dismissively: ‘The Obscure ambiguous term Relation wch. is said to be the largest field of Knowledge confounds us, deceives us’ (PC.733). This presumably records Berkeley’s reaction to Locke’s optimistic remarks about the significance of knowledge of relations that it constitutes ‘the largest field of knowledge’ and that ‘it is hard to determine how far it may extend’.

Locke observes that the discovery of relations between things depends on our ‘sagacity’ to articulate the mediating point of view (‘intermediate ideas’) which connects them, and that the development of algebra illustrates the promising prospect of knowledge of relations as demonstrative knowledge. Indeed, according to Locke, such demonstrative knowledge of relations is not restricted to mathematics which is concerned with quantity (‘number’ and ‘extension’). Morality also belongs to such demonstrative knowledge of relations.

As Furlong observed, ‘relations are for Berkeley something that could attract as well as repel’ in his early thinking in the notebooks. As is quoted above, the repelling aspect is recorded in entries 540 and 733, but on the other hand there are several places where he expresses positive prospects about relations. Just after that 540 entry which insists on the importance of studying numbers ‘in themselves’, he notes that ‘all Number consists in Relations’ (PC.545). It is, then, impossible to study the nature of numbers ‘in themselves’ by setting aside relations, and this conflicts with his emphatic advice in 540. And not far before 733, Berkeley had left these remarks concerning ‘three sorts of truth’: ‘Agreement of relation onely where Numbers do obtain. of Coexistence in Nature, of signification or Including or thinking by Including in Morality’ (PC.677). The classification of kinds of truth here formulated largely corresponds to Locke’s view. Berkeley is likely to be thinking

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32 Essay, Book IV, chapter 3, section 18.
33 Essay, Book IV, chapter 3, section 19.
34 Furlong, ‘Berkeley on Relations, Spirits, and Notions’, p.60.
of moral truths by ‘signification or including’ as a demonstrative system of morality starting from definitions, as Locke does in the *Essay*. If ‘coexistence’ and ‘signification or including’ are broadly to be taken as varieties of ‘relation’, Berkeley seems to have entertained the view, as early as in the notebooks, that truths and scientific knowledge are all concerned with knowing relations. Another remark similar to this on the subject of each particular branch of science appears near the end of the notebooks: ‘Three Sorts of useful knowledge, that of co-existence to be treated of in our Principles of Natural Philosophy, that of Relation in Mathematics, that of definition, or inclusion, or Words (wch. perhaps differs not from that of Relation) in Morality’ (PC. 853).

The notebook entries quoted in the previous paragraph naturally lead us to the conjecture that ‘relation’ was already significant in his theory of knowledge when he was writing the notebooks. However, as we saw, in the published first edition of the *Principles*, there is no mention of ‘knowledge of relations’. It is only in the later edition that Berkeley adds the category of ‘relation’ to the object of human knowledge. Why did he keep silent about ‘relations’ and their place in his system of knowledge in the first publication of the *Principles*? And why did he decide to re-introduce knowledge of relations to his system in the second publication? As to the first question, Luce suggested, in his note to the notebook entry 540 quoted above, that Berkeley ‘had considered relations and their nature, but regarded the *relata* as more instructive than the relation in the earlier stages of speculation. This view was, no doubt, a phase of his feeling for the concrete as against the abstract’. Luce’s suggestion seems to be that Berkeley had already attained to a clear view about the place of ‘relations’ in his system of knowledge in the notebooks, but that he only decided to say

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35 *Essay*, Book IV, chapter 3, section 18-20. But Berkeley later abandoned the idea of demonstrative morality and never developed it in the published writings.

36 *Philosophical Commentaries: Transcribed from the Manuscript and Edited with an Introduction and Index by George H. Thomas*, p. 262-3. In Luce’s view, this entry ‘is evidence (if any were needed) of the maturity of Berkeley’s mind and the breath of his outlook in his early manhood’, and overturns the developmental interpretation which makes much of the second-edition introduction of ‘relations’. But Luce’s answer to the question about the second edition introduction of ‘relations’ that it was ‘half-hearted, not sustained’, is not harmonious with his comment in this note.
nothing about ‘relations’ in the published *Principles* because the chief interest there was to consider ideas by themselves (which are *concrete*) in isolation from relations they may have with each other (which are *abstract*). But this suggestion is puzzling, for Berkeley was certainly interested in defining the objects of ‘speculative science’ and discussed about the occupation of scientific studies in the *Principles*. Luce has nothing to say about what he means by ‘a phase of [Berkeley’s] feeling for the concrete as against the abstract’ in his early thought, and fails to explain why Berkeley in the *Principles* was content with defining the objects of mathematics and natural philosophy just to be ‘ideas of sense’ in spite of his earlier statement in the notebooks that these sciences are concerned with ‘relations of ideas’ as the objects of study.

Earlier than Luce, GA. Johnston provided another account which we can profitably refer to as the starting point in our approach to the question about the absence of ‘knowledge of relations’ in the first edition of the *Principles* and their awkward appearance in the second edition. By contrast to Luce who is strongly opposed to the developmental interpretation of Berkeley’s philosophy, he sees significant developments in Berkeley’s philosophical doctrines from the early to the later stages of his career. As to the question about ‘knowledge of relations’, Johnston links it with Berkeley’s theory of ‘notion’ which Johnston thinks is equivalent to ‘the theory of conceptual knowledge’. According to Johnston, the theory of notion or conceptual knowledge is concerned with ‘knowledge of spirits and selves, of laws and relations’.

ideas, but by way of universal meanings or notions. Thus Johnston sees in Berkeley's philosophical career a continual development towards 'a systematic theory of universal knowledge of spirits' (in which Johnston presumably includes 'knowledge of relations'), and the difference between the first and the second editions of the *Principles* is interpreted by him to be in Berkeley's increasing willingness in the later edition, by employment of the new terminology of 'notion', to accommodate the place for concepts or universal elements in his theory of knowledge.

Now I agree with Johnston that Berkeley's philosophy developed (towards the last major work *Siris*) in the direction of accepting *conceptual* knowledge as distinguished from *perceptual* knowledge of particular sensible ideas, and that the second-edition introduction of 'knowledge of relations' (as constituting the category of *notional* knowledge with spirits) can be taken as indicating this development. But I disagree with him in the emphasis I put on the distinction between the ways by which spirits and relations are known. I think Johnston had missed the unique place of 'knowledge of relations' in Berkeley's theory of knowledge by supposing that it is subordinate to the category of 'knowledge of spirits'. Although it is true, as we saw in section 89, that Berkeley regarded both 'spirits' and 'relations' as objects of notional knowledge, this does not necessarily mean that these two kinds of objects are known exactly the same way. Here we should take sufficient account of Berkeley's observation that 'ideas, spirits and relations are all in their respective kinds, the object of human knowledge and subject of discourse' (my italics). It is granted that according to Berkeley 'relations' and 'spirits' agree in that they are not to be known 'by way of idea'; but if he thought 'spirits' and 'relations' are knowable exactly the same way, why did he

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38 Ibid., pp.159, 161.
39 Ibid., p.161. See also p.119, where he states: 'in 1708 [i.e. in the notebooks], Berkeley denied entirely the universal element in knowledge. His later work was to consist in a gradually increasing recognition of the importance of the universal'. It should be noted that Johnston does not see Berkeley in the earlier stage as rejecting universals altogether. He observes that Berkeley from the start took universality in knowledge for granted. But in the earlier stage Berkeley failed to provide the account of 'what universals are', and towards the later stage he came near to providing it by introduction of notional knowledge as contrasted to knowledge by way of 'ideas' (pp.123-4).
consider relations to constitute the third distinct kind of objects which is not reducible to spirits? In order to make sense of Berkeley’s three-head division of the object of human knowledge made in the second edition of the *Principles*, we should look for the unique feature involved in the way we know ‘relations’ which is not found in the ways we know ‘ideas’ and ‘spirits’.

As I have said in the above, my approach to the question about the place of ‘relations’ in Berkeley’s theory of knowledge correlates it particularly with the context of Berkeley’s theory of knowledge of nature. Accordingly, I consider the unique feature of ‘knowledge of relations’ to be clarified by reference to the development of his view about the way we know nature and its laws. Now Johnston recognizes the connection between Berkeley’s later introduction of ‘relations’ and his view of knowledge of nature, since he observes that notional knowledge is concerned with ‘laws and relations’ as well as ‘spirits and selves’. But it is not clear from Johnston’s discussion how knowledge of ‘laws and relations’ are to be conceived in terms of what he calls ‘a systematic theory of universal knowledge of spirits’ which he thinks Berkeley’s theory of notion amounts to. Here we may well ask what Johnston wants to mean by ‘universal knowledge of spirits’. As we saw, Johnston takes Berkeley’s ‘notion’ as equivalent to conceptual knowledge, and he also says that ‘our knowledge of spirits and relations is … by way of universal meanings or notions’. This seems to be suggesting that knowledge of spirits (and relations) is indirect or mediated by concepts. But Johnston actually insists that for Berkeley notional knowledge must be direct: ‘Knowledge of ideas is by way of either sense-perception or imagination, knowledge of spirits is by way of notions. But in each case knowledge is direct. The cognitive relation of the mind and its objects, whether presentative or notional, is immediate.’ Thus, since Johnston thinks ‘knowledge of relations’ is just a subcategory of ‘knowledge of spirits’, he seems to hold that we know relations ‘by way of

40 Ibid., p.142.
notions' as directly as we know sensible things 'by way of ideas'.

This is not the place to decide on Johnston's interpretation of Berkeley's 'knowledge of relations', but it is at least undeniable that he was somewhat confused about the place of 'relations' in Berkeley's theory of knowledge. While he deals with 'knowledge of relations' in discussion of Berkeley's 'doctrine of knowledge of spirit' or 'doctrine of notions', he in fact develops it more extensively in another place where he examines Berkeley's 'doctrine of representative knowledge' or 'doctrine of signs'. But puzzlingly, Johnston insists that they belong to different spheres of Berkeley's theory of knowledge for the reason that the 'doctrine of signs' concerns individual knowledge whereas the 'doctrine of notions' concerns direct knowledge. According to Johnston, Berkeley's 'doctrine of signs' constitutes his attempt to give a positive account of universals after the abolition of abstract ideas. This doctrine, as he sees it, grew out of Berkeley's struggle to account for universality in knowledge, and it only gradually emerged towards 1732-33. Johnston describes the development of his thought roughly in the following way. As a nominalist, Berkeley's concern in theory of knowledge was to specify the representative which can discharge the function of universality. At first, Berkeley placed the representative function in a particular sensible idea (and a name) which stands for other particulars of the same kind, then sought it in a particular image (and a meaning) which represents other particular ideas via standing for a particular idea which it resembles. Finally, he reached the view that the representative which performs the function of universality is a 'sign'. According to this view, it is not a particular idea or image as such which

41 Yet at times Johnston seems to be suggesting that notional knowledge is indirect: 'The notion is a concept or universal, present to the mind, and having as its objects (a) spirits, (b) mental operations, and (c) relations' (Ibid., p.168). According to this statement, it is only 'notion' as a concept that is directly present to the mind, and the three kinds of objects are known indirectly by having notion of them, i.e. they are objects which are known intentionally by means of notion.

42 Ibid., pp.158-69.
43 Ibid., pp.123-41.
44 Ibid., p.142.
discharges universality, but a particular idea or image as sign: an idea or image considered as a sign has identical reference or the same meaning which is fixed in every occasion it is used. Thus, Berkeley’s ‘doctrine of signs’, which is fully developed in Alciphron, integrates his early thoughts on the function of universality in knowledge, by putting forward the view that we can reason and demonstrate to attain conceptual or universal knowledge in science by using general signs (concepts) for the object of our reasoning and demonstration.

Now it seems to me that what Johnston calls Berkeley’s ‘doctrine of representative knowledge’ or ‘doctrine of signs’ is clearly concerned with ‘knowledge of relations’, and that the second-edition introduction of ‘relations’ as notional knowledge in conjunction with ‘spirits’ is closely connected with the development of this doctrine. In fact, Johnston recognizes these points when he briefly mentions, concluding his discussion of the doctrine of signs, its further development towards ‘the doctrine of notions’: ‘the doctrine of representative knowledge, originating in a bare sensationalism, is seen in the end ... to imply, as the condition of its validity, a system of mental operations’.

While Berkeley up to Alciphron of 1732 ascribed the function of universality to ‘elements originally acquired in sense-perception’, i.e. ideas, in the second-edition of the Principles he ultimately came to ascribe it to entirely different elements, namely, operations of the mind. This

46 In his talk about ‘identical reference’ of signs, Johnston does not attribute to Berkeley the view that signs have natural or necessary connexion with the things signified. He wants to say that Berkeley believed the concept of ‘sign’ to provide him with the way to account for the sameness of meaning necessary for the accomplishment of universal knowledge that science aims at: ‘the characteristic of signs which peculiarly fits them, in Berkeley’s estimation, to play the part of universals, is their identical reference. The meaning of a sign is fixed dogmatically; if it is a true sign it will be understood in precisely the same sense by all who have occasion to use it, and thus it is admirably adapted to supply the medium of reasoning and demonstration’ (Ibid., p. 132). But Johnston immediately goes on to point out that Berkeley’s ‘bare sensationalism’ actually could not accommodate the concept of ‘sign’ as described in this quotation: the only sort of representation it can accommodate is that by empirical association of ideas. Thus, according to Johnston, Berkeley ultimately had recourse to ‘mental operations which differ in kind and principle from mere sense-perception’ to account for identical reference; and this is the ‘doctrine of notions’ (p. 139-41).

47 Ibid., pp. 140-1.
final phase of development is indicated in the passage of section 142 which I have not yet quoted.

We may not I think strictly be said to have an idea of an active being, or of an action, although we may be said to have a notion of them. I have some knowledge or notion of my mind, and its acts about ideas, inasmuch as I know or understand what is meant by those words. What I know, that I have some notion of. ... It is also to be remarked, that all relations including an act of the mind, we cannot so properly be said to have an idea, but rather a notion of the relations or habitudes between things.

This passage is another addition made on ‘relations’ in the second edition and contains some novel points which are not present in sections 89 and 101. Here Berkeley talks about the notion of mental acts in addition to that of minds, and observes on relations that we have a notion of relations rather than an idea of them because relations include ‘an act of the mind’. The reason for discriminating ‘relations’ from ‘ideas’ is, according to this passage, that relations are like mental activity and thus must belong to the category of mind or active being.48

Taking the implication of the above passage into consideration, Johnston’s interpretation about

48 In a recent paper Kenneth Winkler summarizes Berkeley’s view of ‘relations’ by reference to section 142: ‘his thought perhaps [is] that relations are superimposed on things by mental acts of juxtaposition and comparison. If juxtaposition and comparison are acts, perhaps the relations they sustain are also acts. If it is Berkeley’s view that relations can persist through time only so long as the mental acts sustaining them are renewed – if the existence of relations, in other words, calls for constant re-creation – relations begin to look very much like facets of the mind’s activity’. Kenneth P. Winkler, ‘Berkeley and the doctrine of signs’, in The Cambridge Companion to Berkeley, (ed.) Kenneth P. Winkler, Cambridge, 2005, p.149. This observation seems too general to be considered an interpretation of the place and significance of ‘relations’ in Berkeley’s philosophy. Here he pays no attention to the linkage of ‘relation’ with Berkeley’s theory of knowledge of nature, nor (in spite of the title of his paper) does he take into account the possibility that ‘the doctrine of signs’ may be relevant to his new mention of ‘relations’ in the second edition. Winkler also fails to mention Luce’s or Johnston’s discussion on the subject. Earlier in Berkeley: An Interpretation (p.281, n.6) he briefly summarized Berkeley’s view of ‘relations’, but his account there is not more detailed or helpful than the comment quoted above. Winkler’s account can be seen as representing a general lack of concern in the recent literature with the connection between Berkeley’s introduction of ‘relations’ and the development of his theory of knowledge.
the final phase of the development of Berkeley’s ‘doctrine of signs’ seems that it shifted to the
‘doctrine of knowledge of spirit’ or ‘doctrine of notions’, according to which the function of
universality in knowledge was located in mental acts or operations – acts of ‘relating’ – rather than
in signs – particular sensible ideas or images which are made universal by virtue of having identical
reference or the same meaning in the use of them. At this final stage, Johnston presumably thinks,
Berkeley holds that knowledge of universals is attained directly by awareness of mental acts: hence
‘the doctrine of signs’, which accounts for universal knowledge by indirect apprehension through
signs, is ultimately resolved in ‘the doctrine of notions’ according to which we have direct
acquaintance with universals. Thus, Johnston’s view of the place of ‘knowledge of relations’ in
Berkeley’s theory of knowledge may be summarized this way: it had initially been developed – up
to Alciphron – in the sphere of ‘the doctrine of signs’ which is concerned with indirect knowledge
of universality, but at a certain point – in the second edition of the Principles – it transferred to
entirely different sphere of ‘the doctrine of notions’ which is concerned with direct knowledge of
universality. If this is what Johnston has in mind in his talk about the development of Berkeley’s
‘doctrine of signs’ into ‘a system of mental operations’; and if ‘knowledge of relations’ is to be
conceived as consisting in direct awareness of the mental acts of ‘relating’ which functions as
universals; then I disagree and propose another line of interpretation.

According to my interpretation, ‘knowledge of relations’ can be located in Berkeley’s system of
knowledge at the intersection of ‘the doctrine of signs’ and ‘the doctrine of notions’. Whereas
Johnston viewed these two doctrines as belonging to different sphere of Berkeley’s theory of
knowledge, I prefer to consider them to be complementary in his account of knowledge of relations.
Accordingly, I do not think it necessary to interpret his remarks on notional knowledge of relations
in the second edition of the Principles as indicating a further development of ‘the doctrine of signs’
presented in Alciphron. For, as I see it, Berkeley retained, even after the second edition of the
Principles, the view that knowledge of relations is indirect knowledge which involves the use of signs. In the exposition of what he calls 'the doctrine of signs' in Alciphron, Berkeley observed on the nature of science that 'all sciences, so far as they are universal and demonstrable by human reason, will be found conversant about signs as their immediate object' (Alc.VII-13). In the second edition of the Principles, he stated in section 101 that 'the two great provinces of speculative science, conversant about ideas received from sense and their relations, are natural philosophy and mathematics' (PHK.101). Is it likely that Berkeley considered these two statements to be expressing different views? Did he changed his mind about the object of scientific knowledge within only two-years interval (between 1732 and 1734)? The evidence that he did not can be obtained from the third edition of Alciphron (1752), where the following passage is inserted to Euphranor's summary of the doctrine of signs: 'The signs, indeed, do in their use imply relations or proportions of things; but these relations are . . . not making of themselves distinct ideas to the mind, exclusive of the particular ideas and signs' (Alc.VII-12; my italics).

Johnston developed important interpretive points about Berkeley's view of 'knowledge of relations' which Berkeley scholars of the subsequent generations unfortunately failed to take seriously. We have seen Luce's dismissive attitude to the developmental interpretation which makes much of Berkeley's introduction of notional knowledge of relations in the second edition of the Principles. In a similar vein, T.E. Jessop commented in his editorial note to section 142: 'Berkeley nowhere develops this view of relations, which seems to imply that relations among "ideas" are not discovered but instituted by the mental act, or at any rate that the activity of relating somehow enters into the content of the relation'. It is a valuable insight of Johnston that he considered Berkeley's later introduction of 'relations' closely in terms of the development of his positive account of conceptual or universal knowledge. This insight is well justified by the brief remark

Berkeley makes in the *Introduction*: ‘universality ... consist[s] ... in the relation [a thing] bears to the particulars signified or represented by it: by virtue whereof it is that things, names, or notions, being in their own nature *particular*, are rendered *universal*’ (Pl.15). And Johnston’s discussion on ‘relations’ is also illuminating in seeing notional knowledge of mental acts mentioned in the second edition of the *Principles* as correlated with ‘the doctrine of signs’ in *Alciphron*. But he did not sufficiently clarify the interrelation between ‘the doctrine of signs’ and ‘the doctrine of notions’. The interpretive suggestion I want to develop further from Johnston’s insight is how the category of ‘relations’ introduced in the second edition of the *Principles* is to be placed in Berkeley’s mature theory of knowledge at the intersection of these two doctrines.

In my view, central to understanding the place of ‘knowledge of relations’ in Berkeley’s system are the concepts of ‘use’ and ‘general rule’ prominent in his ‘doctrine of signs’. And consideration of this point will enable us to see how knowledge of relations is conceived as notional knowledge of mental operations. In the *Introduction* to the *Principles*, Berkeley repudiated ‘abstract ideas’ and argued that possession of abstract ideas is not necessary to ‘the enlargement of knowledge’ (Pl.15). But this move should take him to the question about the possibility of scientific knowledge which depends on knowledge of concepts or universals. Berkeley was well aware of this from the start of his philosophical career, and in the *Introduction* he acknowledged that there are *general* ideas while repudiating *abstract general* ideas (Pl.12). Now the crucial point is how Berkeley can embrace ‘general ideas’ in spite of his fundamental commitment to the thesis that whatever ideas, whether of sense or of imagination, are particular. The same question applies to the generality of ‘words’ or ‘names’, since they are, taken by themselves, particular sensible ideas. In the progress of his philosophical career from the early to the middle period, the answer to this question which became increasingly dominant in Berkeley is that the key to the problem of universality lies in the concept of *use*. The germ of the answer in this direction was already present in the first edition of the
 Principles: he remarked in the *Introduction* that ‘as [the] particular line becomes general, by being made a sign, so the name *line* which taken absolutely is particular, by being a sign is made general’ (Pl.12). The implication of this remark is that generality is something *imposed on* particular ideas without changing their particular nature, and that an idea is *made* a ‘sign’ which bears generality *in accordance with the way it is used* by the mind\(^5\). But it is not until in *Alciphron* that Berkeley confidently locates the source of universal knowledge in the *use* of an idea. And what is particularly remarkable about *Alciphron* is that generality of signs is conceived to be derived from their *use according to the ‘general rules’* (Alc.VII-11).

Thus, it is now clear that the introduction of ‘knowledge of relations’ in the second edition of the *Principles* is closely linked with Berkeley’s long-standing engagement with the problem of universal knowledge of science. From the earliest stage of writing the notebooks, Berkeley sought to find out the way to account for the possibility of scientific knowledge without conflicting with his fundamental commitment to nominalism. The solution he finally reached is that science, as universal knowledge, is directly concerned with *signs* and their *use*, and that signs, which are particular ideas in themselves, are ‘made general’ through their use according to ‘general rules’\(^5\). Now ‘signs’ as the immediate objects of scientific studies are *artificial* signs of human invention, as opposed to *natural* signs which we learn by experience. The essential characteristic of scientific knowledge, then, consists in the mind’s pursuit of universal knowledge by the use of artificial signs in accordance with general rules. The point here of particular importance for clarifying the

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\(^5\) The suggestion that Berkeley wants to clarify the nature of conceptual thinking or general meaning by appeal to the notion of ‘use’ has been made by several commentators. See G Dawes Hicks, *Berkeley*, p.94; Gerd Buchdahl, *Metaphysics and the Philosophy of Science*, p.285ff.; Tom Stoneham, *Berkeley’s World: An Examination of the Three Dialogues*, pp. 242-5.

\(^5\) Johnston reduces the ‘use’ of sign simply to mental operations when he remarks: ‘in using a particular to serve as a sign we do not take it simply at its face-value with all the features which we observe it to possess. Before we can use it as a sign we must have some acquaintance with the purpose it is to serve and the thing it is to signify. Thus, when we use it as a sign, we perform certain mental operations upon it’ (p.139). But we might say that
interconnection between ‘the doctrine of signs’ and ‘the doctrine of notions’, is that the general rules which define the way the mind uses artificial signs in a given domain of scientific discourse (particular branches of mathematics or physics) are the stipulation of the mind. In other words, acquisition of universal knowledge in science essentially involves active or creative moments since its immediate objects, i.e. artificial signs, are given general meaning in accordance with the rules which the mind applies to signs by its own decision. As we saw in discussion of Berkeley’s view of ‘knowledge of ideas’, knowledge of the particulars, ideas of sense and of imagination, according to Berkeley, is attained by simple perceptual apprehension: the mind captures the whole being of ideas as they are present to the mind’s awareness. By contrast, conceptual or universal knowledge which is concerned with artificial signs of our own invention, involves more than mere passive awareness of the presented object. Rather, the mind creates objects of conceptual knowledge to the extent that it determines the content of the objects known, general signs, by stipulating the general rules by which they are to be used in a certain domain of scientific discourse.

However, this is not to say that the mind is given a free hand in determining the content of general signs and therefore that conceptual knowledge by the use of artificial signs is entirely subjective. Here we should sufficiently take into account Berkeley’s remark in Alciphron that ‘all sciences … [are] conversant about signs as their immediate object, though these in the application are referred to things’ (Alc.VII-13; my italics). It is the central insight of Berkeley’s philosophy of science that theoretical construction by the employment of general signs and the enlargement of knowledge by them in scientific studies are to be ultimately referred back to the improvement of our well-being in the world. Concepts or general thoughts should have pragmatic significance, and the symbolic system by which conceptual knowledge of science is attained is not self-contained but is representative of the extra-symbolic world of particular sensible things. While conceptual knowledge involves decisions on the side of knowing subject about what signs to adopt and what
general rules to be applied in their operation, general thought which is processed \textit{on signs} is not \textit{about} signs themselves but is ultimately about the real sensible world. Thus, according to Berkeley, the \textit{truths} of conceptual knowledge by the use of artificial signs should be determined in terms of the \textit{correspondence} or \textit{agreement} of symbolic thoughts with particular objects of sense perception. The content of general signs is constrained not only by the syntactical rules of their operation but semantically as well by the rules of their translation into sensible things. Although the general rules of semantics as well as syntax to be applied to artificial signs depend on the mind’s decision and therefore subjective, the system of signs defined by those rules should have \textit{objective validity in practical application} so that the mind can successfully steer its way in the world with it.

It is misleading, then, that Johnston observes that Berkeley’s ‘doctrine of signs’ finally developed into what he characterizes ‘a system of mental operations’ or ‘a system of universal knowledge of spirits’. In disagreement with Johnston, I do not ascribe to Berkeley the view that conceptual or universal knowledge as ‘knowledge of relations’ consists in the direct awareness of mental acts of ‘relating’ about ideas, which is a subcategory of ‘knowledge of spirits’. Rather, conceptual or universal knowledge for Berkeley is the ability to negotiate with the world by the use of general signs. And this ability, which I may call \textit{the ability of symbolic representation}, is reducible neither to knowledge of ‘ideas’ nor to that of ‘spirits’, since it involves more than mere awareness of certain things or objects presented to the mind, such as ideas, minds, or mental operations: it concerns \textit{the mind’s adaptation to the circumstantial world}. In other words, Berkeley holds that \textit{conceptual knowledge consists in the ability of regulating mental operations with regard to the world of sensible ideas by the inventive use of symbolic systems}. Herein lies what I consider the unique place of ‘knowledge of relations’ as the third distinct category in Berkeley’s system of knowledge. We saw the second-edition remark in section 89 that ‘we know and have a notion of relations between things or ideas, which relations are distinct from the ideas or things related, in as
much as the latter may be perceived without our perceiving the former'. Commentators have
tended to see this remark only in terms of another remark in section 142 that ‘relations include an
act of the mind’, but this is, in my view, inadequate. For, the ‘relations’ Berkeley had in mind in
these sections are not just mental acts of ‘relating’ which occurs at random but the mental acts of
‘relating’ which are regulated by symbolic representation and which are of general character by
virtue of their essential connection with general rules. And this interpretation of ‘relations’ fits well
with the sentence in section 101 that ‘the two great provinces of speculative science, conversant
about ideas received from sense and their relations, are natural philosophy and mathematics’.

We are now in the position to see the interconnection between Berkeley’s introduction of
‘knowledge of relations’ and his account of knowledge of nature. According to my interpretation,
Berkeley’s addition of the third category of ‘relations’ to his system of knowledge is closely linked
with the development of his account of our knowledge of the laws of nature, which constitutes
conceptual or universal knowledge of nature as contrasted with perceptual knowledge of ideas of
sense which are particular. Towards the middle period, it became clearer to Berkeley that ‘relations’,
i.e. the laws of nature, are to be distinguished from the particular sensible ideas related, through the
further reflection on the role and nature of symbolic representation in the formation of knowledge
of laws. Although he recognized in the first edition of the Principles the role of ‘signs’ in his
account of knowledge of laws, he was not clear at that earlier stage about the relationship between
the use of signs and the creative or inventive elements involved in knowledge of laws. Particularly
important in this connection is his positive evaluation in Alciphron of the essential contribution of
artificial signs for the advancement of our knowledge of laws at the level of scientific studies.

Our knowledge of ‘the laws of nature’ can be distinguished into two different levels which
accomplish generality in different degrees. We start from the learning of natural signs through
experience of the repeated connection between ideas of sense. As we will see later in detail in
chapter 3, ordinary knowledge of laws consists in the ability of using natural signs on the basis of the experienced regular connections of ideas. The knowledge of laws thus acquired at the ordinary level involves conceptual knowledge which applies to the relatively narrow scope of experience, and it consists in the ability of adapting our actions to the immediate circumstance in which we learned natural signs by associations of ideas. But at the scientific level, we can attain conceptual knowledge of nature which comprehends the far greater scope of experience than that we attain at the ordinary level. Such advancement of conceptual knowledge at the scientific level is made possible by the use of artificial signs which depends on our inventive genius. As we will discuss extensively in chapter 4, Berkeley observes in Alciphron that the immediate objects of science are artificial signs and their use rather than sensible things or ideas, and that the significance of this symbolic method for science consists in its suitability to the formulation of 'general rules' and the regulation of actions by them. What is implied by his remarks on the nature of science in Alciphron is that artificial signs serve as the indispensable instrument in science for the revision of our conceptual knowledge of nature. It is the strength of science in pursuit of general knowledge that it is concerned with the symbolic system in which the laws of nature are formulated by employment of the arbitrarily chosen set of signs and the operational rules of our own stipulation. Thus, by inventive revision of such symbolic system we can advance our knowledge of the laws of nature so that the newly constructed symbolic system enables us to deduce the more general laws which subsume the less general laws we already know.

Thus, in prospect of discussions in the later chapters, I put here the chief points of my interpretive suggestion that the introduction of 'relations' in the second edition of the Principles is connected with the development of Berkeley's account of knowledge of nature. In my view, Berkeley added 'relations' to his system of knowledge as the third distinct category because he became more appreciative towards the middle period of the active creative elements involved in the
formation of our knowledge of 'the laws of nature'. The unique feature of 'knowledge of relations' Berkeley came to appreciate in Alciphron and the second edition of the Principles, in connection with his account of knowledge of the laws of nature, lies in its progressive or evolutionary moment which derives from the indirect way we attain it: knowledge of laws, considered as conceptual knowledge of nature, consists in the ability of adapting ourselves to the world by means of 'signs'; and we can develop this ability in accordance with the sophistication of symbolic representation: that is, our ability of acting in the world is enhanced depending on the capacity of the 'signs' we use to represent the laws of nature. Although God exhibits to us natural signs which enable us to represent the laws and predict what ideas are coming in the future experience, the learning of natural signs does not give us very extensive 'foresight'. And in ordinary practice, natural signs sufficiently answers to the necessity to cope with the immediate circumstance. But philosophers aspire to accomplish 'a greater largeness of comprehension', and they contrive a system of artificial signs which is capable of formulating the most universal laws of nature, such as Newton's law of gravitation. In the middle period, Berkeley appreciates the significance of natural philosophers' 'endeavour towards omniscience' (PHK.105). Such pursuit of omniscience or comprehensive prediction of the course of nature consists in the revision of the artificial symbolic system which represents the laws of nature. And this symbolic representation of laws constitutes 'knowledge of relations' in that it involves the mind's acts of 'relating' natural phenomena – ideas of sense – in accordance with the system of artificial signs which the mind contrives for itself.
Chapter 2
Knowledge of ideas and Berkeley’s early intuitionism

In this chapter, I explore Berkeley’s intuitionist account of knowledge in his early thought, first in the context of his rebuttal of scepticism, and next in the context of his view of the use of language in the acquisition of knowledge.

In section 1, I discuss the Cartesian intuitionist motif in Berkeley’s response to scepticism. In the *Principles*, he attacks two forms of scepticism in modern philosophy: the one arising from the representational theory of perception, and the other from our ignorance of the minute structure of bodies. We will see that the chief point in his response to either form of scepticism is to show that we have intuitive knowledge of physical reality. His strategy in the accomplishment of this result is to reduce knowledge of physical things to ‘knowledge of ideas’. Our knowledge-claim about physical reality is secured by identifying the locus of reality in ‘ideas’ present to direct perceptual awareness, which all the modern philosophers agree are known intuitively.

In section 2, I turn to the difficulties about Berkeley’s commitment to intuitionism. Although his intuitionist response to scepticism appears plausible as long as he equates nature just with ‘ideas’, the natural world contains another stratum, ‘the laws of nature’. Laws, however, are not the thing of which we have ‘intuitive knowledge’. In his talk about ‘real things’, Berkeley generally does not distinguish the things considered as ‘collections of ideas’ and their component individual ideas. Knowledge of ‘collections’, however, involves knowledge of laws. We will examine the passages in the *Three Dialogues* where Berkeley comes near to acknowledging the difference between knowledge of ideas and knowledge of things in his treatment of perceptual error. But unfortunately, he fails to pay sufficient attention to the implications which the problem of perceptual error has for
his response to scepticism, leaving the status of knowledge of ‘collections’ ambiguous.

In section 3, I consider an alternative way of responding to scepticism which would have been available to Berkeley outside the intuitionist framework he adopted. In defence of our claim of knowing physical reality against sceptics, he could appeal to ‘moral certainty’, namely, the certainty that is lower than the ‘absolute certainty’ of intuition but is proportional to the regulation of action in ordinary life. Since he clearly conceives knowledge of laws in terms of practical significance, his recourse to ‘moral certainty’ in defence of our knowledge of physical things should have been congenial to him. Thus, without adherence to ‘intuition’, the way would have been open to Berkeley to defend our ability of knowing physical things as well as of knowing individual ideas. But I will observe that this was not the way he actually took. He opted for the way to meet sceptical challenge by appeal to intuitive knowledge of ‘ideas’ which yields absolute certainty.

In section 4, I explore the motif of ‘thinking without words’, or the ‘meditative ideal’, which is prominent in the Introduction to the Principles and its manuscript. Characteristic of Berkeley’s early philosophy is the subsidiary status assigned to language in the methodology of knowledge. This is clearly seen in the solitary-philosopher thought experiment in the Manuscript Introduction. In the early period, Berkeley identified the true source of knowledge in particular ideas of sense, holding that the way to knowledge was to have ‘clear perception’ of the ideas given to us through the senses. From such a perspective, he tended to regard the use of language as the impediment to the intuition of ideas and the chief source of the ‘doctrine of abstraction’. This meditative ideal of the ‘solitary philosopher’ in his early thought will be later contrasted with the motif of ‘symbolic substitution’ in his middle-period theory of knowledge which we discuss in chapter 4.

1. Cartesian heritage and the intuitionist motif in Berkeley’s response to scepticism
In the long tradition of philosophical thinking about knowledge, the form of knowledge which has been esteemed the most ideal and fundamental is ‘intuition’. In the early modern period, Descartes gave a powerful expression to this thought in his influential *Rules for the Direction of our Native Intelligence*. He distinguishes two ways by which we arrive at certain knowledge: one is ‘intuition’ and the other ‘deduction’. Intuition is defined by Descartes as

the conception of a clear and attentive mind, which is so easy and distinct that there can be no room for doubt about what we are understanding. Alternatively, and this comes to the same thing, intuition is the indubitable conception of a clear and attentive mind which proceeds solely from the light of reason.\(^5^2\)

According to Descartes, we have certain knowledge either by intuition or by deduction. But it is intuition that yields absolute certainty free from doubt. This is because intuition takes place ‘all at once, and not bit by bit’, whereas deduction involves ‘a kind of movement of our mind’ from one intuition after another\(^5^3\). Because of the intervention of time, deductive knowledge derives its certainty from ‘memory’, which is fallible. But for our purpose here, this difference between intuition and deduction is not relevant\(^5^4\). The important point is that in the Cartesian system of knowledge, intuition is given the paradigmatic status in that it gives the ultimate foundation for construction of science and knowledge. Intuition is the mind’s ‘clear and attentive’ conception of

\(^{52}\) Descartes: Selected Philosophical Writings, translated by John Cottingham, Robert Stoothoof, Dugald Murdoch, Cambridge, 1988, p.3.

\(^{53}\) Ibid., p.11.

\(^{54}\) Berkeley speaks about this distinction of ‘intuition’ and ‘deduction’ in an entry of the notebooks, where he observes that ‘certainly I cannot err in matter of simple perception’ whereas ‘in long deductions made by signs there may be slips of memory’ (PC.693). The term ‘simple perception’ (or ‘simple view’) is used by Malebranche in the *Search after Truth*, and it is likely that Berkeley learned Cartesian methodology in the *Rules* through reading the book VI of the *Search*. Descartes’ *Rules* was first published in 1701, but there is no evidence that Berkeley was acquainted with it. For Berkeley’s reading of the book VI of the *Search*, see Luce, *Berkeley and Malebranche*, chapter 1.
the objects present to it. Deduction, or demonstration, is a series of intuition proceeding step by step in reasoning from a premise to the conclusion. Since knowledge is either intuitive or demonstrative, all knowledge should be ultimately reducible to intuition. This view of intuition as paradigmatic of knowledge (let us call it intuitionism), was accepted by philosophers of the subsequent generation, including the ‘empiricist’ Locke and the ‘rationalist’ Malebranche. Intuitionism in the theory of knowledge was a common Cartesian heritage of early modern philosophy.

Berkeley, too, started his philosophical career as an enthusiastic champion of intuitionism, and intuitionism certainly plays an essential part in his project of refuting scepticism about knowledge of the external physical world. Earlier in the notebooks, he confidently pronounced that he is far better off than other philosophers in affirmation of the existence of the physical world:

We have an intuitive Knowledge[sic] of the Existence of other Things besides our selves & even preceedaneous to the Knowledge of our own Existence, in that we must have Ideas or else we cannot think. (PC.547)

I am the furthest from Scepticism of any man. I know with an intuitive knowledge[sic] of the existence of other things as well as my own Soul, this is what Locke nor Scarce any other Thinking Philosopher will pretend to. (PC563)

In these entries he alludes to the general agreement among philosophers after Descartes that knowing the existence of the self is the paradigm example of intuitive knowledge, and claims that he takes one step further by extending the scope of intuitive knowledge of existence to other things than ourselves, i.e. physical things. According to the esse-percipi thesis, physical things are all reduced to just ‘ideas’ perceived by sense and their collections. Thus, since presentation of ‘ideas’ to the mind is precondition of the occurrence of any thoughts or volitions (cf. ‘some Ideas or others I
must have so long as I exist or Will' (PC.842)), and since physical things are nothing different from
their constituent ‘ideas’, Berkeley claims that we have intuitive knowledge of their existence even
prior to that of our own existence. These thoughts are reflected in a passage of the Principles where
Berkeley accuses philosophers of their ‘doubtfulness’: they acknowledge that ‘we cannot attain to
any self-evident55 or demonstrative knowledge of the existence of sensible things’; whereas, for his
part, ‘I can as well doubt of my own being, as of the being of those things which I actually perceive
by sense’ (PHK.88)56.

In the Principles and the Three Dialogues, the term ‘intuition’ does not frequently appear. But
certainly it appears repeatedly in another guise, namely, in his denial of the ‘twofold existence of
the objects of sense’ (PHK.86). According to the representationalist view commonly adopted by
philosophers, including Descartes, Locke, Malebranche, we do not know physical things directly
by themselves, but only by mediation of the ‘ideas’ distinct from and representing real physical
things in the world. As Berkeley sees it, this dichotomy of the ‘intelligible’ realm of ideas and the
‘real’ world of things is ‘the very root of scepticism’ (ibid.). In the highlight sections 86-8 of the
Principles, he puts forward the identity of ideas and real things as the antidote to scepticism.
Modern philosophers all agree that ‘ideas’, considered as the immediate objects of perception, are
always perfectly knowable with absolute certainty: whenever we perceive ideas, we directly know
that they exist and what they are, and this knowledge is infallible. Here is intuition par excellence.
But philosophers commonly suppose the real physical world to be distinct from ideas, wrongly

55 In the manuscript, Berkeley uses ‘intuitive’ for ‘self-evident’. Works, II, p.79.
56 Here is another and more straightforward expression of the same thought in the Three Dialogues: ‘My own mind and my own ideas I have an immediate knowledge of’ (DHP. 232). It is not correct to take Berkeley as limiting his claim about the intuition comparable to self-knowledge only to ‘ideas’, denying the applicability of such claim to ‘bodies’. I will discuss this point in the next section. The comparison of knowledge of physical things with self-knowledge is repeated in yet other two places in the Three Dialogues (230/257). This persistence of the same motif of parity in the texts sufficiently indicates that Berkeley’s claim about intuitive knowledge of physical things was developed with a clear recognition that it is an enlargement of Cartesian intuitionism.
placing the guarantee of knowledge on the side which is known only by mediation of ideas; thus having made the certainty of knowledge beyond our reach, they were inevitably led to scepticism. But to this, Berkeley contrasts the merit of his own position. He repudiates the representationalist dichotomy of the ‘intelligible’ and the ‘real’, and places the guarantee of knowledge of the real physical world on the perfectly knowable side, i.e. on the side of ‘ideas’. Therefore, in his position, we are entitled to claim ‘intuitive knowledge’ about real things in the world.

It was thus Berkeley’s central concern to refute scepticism by claiming that his immaterialism enables us to enjoy ‘intuition’ of physical things as well as of our own selves. This point that intuitionism plays a key role in his rebuttal of scepticism is clear enough if we consider that he deliberately placed the claim of ‘perfect knowledge’ at the centre of the highlight sections 86-8.

Colour, figure, motion, extension and the like, considered only as so many sensations in the mind, are perfectly known, there being nothing in them which is not perceived. But if they are looked on as notes or images, referred to things or archetypes existing without the mind, then are we involved all in scepticism. (PHK.87)

57 It may also be instructive to compare this passage of Berkeley with the notorious passage of Locke’s Essay where Locke considers a sceptical challenge: ‘There can be nothing more certain, than that the idea we receive from an external object is in our minds; this is intuitive knowledge. But whether there be anything more than barely that idea in our minds, whether we can thence certainly infer the existence of any thing without us, which corresponds to that idea, is that whereof some must think there may be a question made’. Essay concerning Human Understanding, Book IV, chapter 2, section 14. In light of this passage, Berkeley can be taken to suggest in section 87 that he, unlike Locke (who was content with claiming ‘sensitive knowledge’, which, as Locke acknowledged, does not afford the highest certainty of intuition and demonstration), is in a position to claim intuitive knowledge of the existence of the physical world. But Berkeley’s alluded target is, of course, not necessarily confined to Locke. The same passage can also be read in the light of Malebranche’s remark in the Search: ‘all things we see immediately are always such as we see them, and we err only because we judge that what we see immediately is found in the external objects that are the cause of what we see’ (The Search, Book 1, chapter 14, sect. 2; LO 69).
I have quoted the first half of this passage in the preceding chapter, together with the related one in the *Three Dialogues* (DHP.206). In either of the passages of the *Principles* and the *Three Dialogues*, Berkeley grounds his claim of ‘perfect knowledge’ on the transparency of perceived objects: whatever qualities of things, as long as they are ‘ideas’ in the mind, are present to us wholly perspicuous to our perceptual awareness. And he may well be aware that what he speaks of as ‘perfect knowledge’ is equivalent to ‘intuitive knowledge’ of Cartesian epistemology. Indeed, the defining character of Cartesian ‘intuition’ is transparent cognition: it is ‘clear and distinct’ perception. According to Descartes’ definition given in the *Principles of Philosophy*, a ‘clear’ perception is that which ‘is present and accessible to the attentive mind – just as we say that we see something clearly when it is present to the eye’s gaze and stimulates it with a sufficient degree of strength and accessibility’; a ‘distinct’ perception is the perception which is clear in toto with its contents fully articulated, such that ‘it is so sharply separated from all other perceptions that it contains within itself only what is clear’. In short, in the ‘clear and distinct’ perception, an object is presented to the mind’s perceptual awareness as fully accessible and articulated.

Thus, Berkeley’s project of replying to the external-world scepticism is fairly well to be characterized as the endeavour to meet the sceptical challenge, whose power is enhanced by Cartesian representationalism, in the spirit of Cartesian intuitionism. As a sceptic Pierre Bayle famously argued in the *Historical and Critical Dictionary*, ‘the new philosophy’ of Cartesianism can be taken to lend force to the ancient Pyrrhonism by their doctrine of the nature of bodies and the way we know them. In remark B in the article on Pyrrho of the *Dictionary*, Bayle shows how the modern scepticism grown on the soil of Cartesian philosophy can seize the opportunity to claim victory by employment of an argument *ad hominem*. Ancient Pyrrhonian sceptics satisfied themselves with suspension of judgement about the true and real nature of physical things, giving

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up any positive claims going beyond appearances. But a Cartesian sceptic, by appeal to the alleged
criteria to distinguish the qualities which truly exist in external bodies from those which do not, can
push his argument as far as to deny the existence of bodies themselves.

Today the new philosophy speaks more positively. Heat, smells, colours, and the like, are not in the
objects of our senses. They are modifications of my soul. I know that bodies are not at all as they
appear to me. They would have wished to exempt extension and motion, but they could not. For if the
objects of our senses appear coloured, hot, cold, odoriferous, and yet they are not so, why can they not
appear extended and shaped, in rest and in motion, though they are not so? … I could therefore feel
heat and cold, see colours and shapes, extension and motion, even though there were no bodies in the
universe. I have therefore no good proof of the existence of bodies. ⁵⁹

We can clearly hear this passage resounding in section 87 of the *Principles* where Berkeley insisted
on ‘perfect knowledge’ of ‘colour, figure, motion, extension and the like’ insofar as they are
‘ideas’⁶⁰. Philosophers under the influence of the new physics typically draw the line between
extension, motion, etc. which *really are* in bodies (called primary qualities by Locke) and colour,
heat, smell which *only appear to be* in them (secondary qualities), holding that there is the real
physical world composed of the former kind of qualities. But they cannot successfully maintain this
claim because of the representationalist framework in which the distinction of primary/secondary
qualities is placed: for, as far as the ideas which represent those qualities are concerned, there is
after all no legitimate way to justify such distinction – the point of subjectivity and variation equally

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⁶⁰ For a more detailed documentation of Berkeley’s relationship to Bayle’s exploitation of
Cartesian philosophy in favour of sceptical conclusions, see Richard H. Popkin, ‘Berkeley and
applies to the *ideas* of both kinds of qualities. And Cartesians acknowledge that we know bodies only by mediation of the ideas representing them. Thus, if they hold secondary qualities are unreal, they should conclude the same with primary ones. The result is that they must give up the whole physical reality. Berkeley’s reply to this Bayleian sceptical argument is that the real physical world is nothing distinct from ‘ideas’. Once the representationalist dichotomy of real and ideal is rejected, Bayleian scepticism loses its force. And with that rejection, we give up the ontological bifurcation of primary/secondary qualities as well: since primary and secondary qualities are equal in all respects on the phenomenal level of ideas, both of them *are really in* bodies as they appear to be. Thus Berkeley brings us back to the immediate contact with physical reality, enabling us to claim that we know there are bodies with all those qualities we see and feel in them. Physical reality is just the world of ‘ideas’, and ideas, if they are taken by themselves and not seen as ‘notes or images’ of real things, are ‘perfectly known’ – we have ‘intuitive knowledge’ of physical reality.

Besides the scepticism which trades on the representationalist dichotomy of perceptual object, Berkeley also pays attention to the threat to our claim to knowledge of physical reality which arises from another specific consideration. This scepticism – which Daniel Garber has aptly named ‘corpuscular scepticism’ – stems, somewhat paradoxically, from the supposed success of scientific theory. According to the corpuscularian theory of bodies (which is undoubtedly inspired by the improvement of the microscopes), those qualities or behaviours of bodies which we perceive

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61 As Bayle elaborated it in Remark H in the article on Zeno. See Bayle, op. cit., p. 373ff.
62 Daniel Garber, ‘Locke, Berkeley, and Corpuscular Scepticism’, *Berkeley: Critical and Interpretive Essays*, (ed.) C.M. Turbayne, Minneapolis 1982. Garber argued that we should carefully distinguish Berkeley’s response to two kinds of scepticism, one ‘the veil-of-perception scepticism’ and the other ‘corpuscular scepticism’. Though these were generally mixed by commentators, Garber pointed out by a careful reading of the text that they were actually distinct and that Berkeley himself thought they were. I agree with Garber in these points (as it seems many commentators do now). I also accept his contention that ‘Berkeley recognizes some sense in which corpuscles can exist in the world of ideas’ (p.188). For objections to Garber’s reading, see Margaret D. Wilson, ‘Berkeley and the Essences of the Corpuscularians’, in *Essays on Berkeley: A Tercentennial Cerebration*, (ed.) J. Foster & H. Robinson, Oxford, 1985, pp.131-47.
by the senses at the ordinary macroscopic level are causally derived from, and are ultimately to be explained by, the mechanical structure identifiable at the microscopic level. ‘Corpuscular scepticism’ focuses on the *incompleteness* of our knowledge of the internal causal mechanism (rather than the ideal/real dichotomy of representationalism) and claims that we are not entitled to knowledge of a body unless we reach the *complete* understanding of the minute mechanical structure of the body and how its observable qualities or behaviours are produced by that structure (as by the *efficient* cause). The point of this scepticism is that, while scientists may have progressed to some extent within some limited scope toward specifying such microscopic mechanism of bodies, we are still very far from reaching the point to discover that such and such micro-level structure necessarily produces such and such observable phenomena.

One great inducement to our pronouncing our selves ignorant of the nature of things, is the current opinion that every thing includes within it self the cause of its properties: or that there is in each object an inward essence, which is the source whence its discernible qualities flow, and whereon they depend. Some have pretended to account for appearances by occult qualities, but of late they are mostly resolved into mechanical causes, to wit, the figure, motion, weight, and such like qualities of insensible particles. (PHK.102)

What is unacceptable about this scepticism to Berkeley is that it undermines the reliability of sense which informs us of the various manifest properties of bodies by appeal to the imagined ignorance of their hidden properties. According to the sceptics of this kind, ‘we are miserably bantered ... by our senses, and amused only with the outside and shew of things. The real essence, the internal qualities, and constitution of every the meanest object, is hid from our view’. Such pessimism about the sense-faculty that it is blind to the ‘true and real’ nature of bodies was developed eloquently by
the philosophers deeply impressed by modern science, particularly, among them, by Locke. But Berkeley retorts, "all this complaint is groundless, and that we are influenced by false principles to that degree as to mistrust our senses, and think we know nothing of those things which we perfectly comprehend" (PHK. 101). In his view, the senses afford us 'perfect comprehension' of the nature of things, and the alleged failure of them to discover the internal mechanism of bodies to us provides no reason to undermine their reliability.

In response to corpuscular scepticism, Berkeley takes a strategy which is quite different from that he took in response to representational scepticism. But both responses agree in the conclusion that we have 'intuitive knowledge' of physical things. In his rebuttal of representational scepticism, he tried to disarm it by eliminating the alleged ideal/real dichotomy. But to corpuscular sceptics, he concedes that there is indeed the distinction between observable phenomena and unobservable inner mechanism. He is always prepared to affirm that there may be very small animals with more acute senses than ours, which may discern the minute structure of things insensible to us; he also accepts that it is hard to set a limit to the improvement of the microscopic invention which would enable us to discover the new scenes of the microworld hitherto unknown to us. Thus he mentions 'the clockwork of Nature, great part whereof is so wonderfully fine and subtle, as scarce to be

63 To quote one representative passage where Locke develops this theme: 'Our faculties carry us no further towards the knowledge and distinction of substances, than a collection of those sensible ideas which we observe in them; which ... is more remote from the true internal constitution from which those qualities flow, than ... a countryman's idea is from the inward contrivance of that famous clock at Strasburg, whereof he only sees the outward figure and motions' (Essay, Book 3, chapter 6, sect.9). This Lockean agnostic theme is, however, only the other side of a very optimistic assumption that once we know the 'true internal constitution' of bodies we can deduce all their qualities and possible behaviours a priori without observations. Thus in the very place where our 'incurable ignorance' about the microstructure of bodies is highlighted, he states: 'Did we know the mechanical affections of the particles of rhubarb, hemlock, opium, and a man, as a watchmaker does those of a watch, whereby it performs its operations; ... we should be able to tell beforehand that rhubarb will purge, hemlock kill, and opium make a man sleep: as well as a watchmaker can, that a little piece of paper laid on the balance will keep the watch from going till it be removed ...' (Book IV, chapter 3, sect.25). So Berkeley in his response to 'corpuscular scepticism' undermines this optimism underlying the clock metaphor to eliminate the pessimism derived from it.

85
discerned by the best microscope' (PHK.60). Berkeley’s way with corpuscular scepticism is not to do away with the microworld. Rather, he wants to enlarge the gap between the observable phenomena and the microstructure of a physical thing further to the point of claiming that they are actually not two aspects of one single thing but two distinct things which can exist independently of each other. The unobservable minute mechanism is not to be considered as constituting the essence of which observable phenomena are mere outward appearances, nor is it to be considered as the causal ground from which observable phenomena result. Berkeley denies all such ontological dependences of macro phenomena on the microstructure, and aims thereby to conclude that our ignorance about the microworld yet to be discovered does not at all prevent us from claiming that we ‘perfectly know’ the properties of bodies manifest to the senses.

The force of corpuscular scepticism derives from the popular supposition that when we ‘get closer to’ the visible feature of a thing and thereby ‘penetrate deeper’ into it, we find out there its ‘true and real nature’ and thus know the same thing ‘better’. But as Berkeley sees it, this supposition (expressed, of course, in a popular and loose language) is false. The exact truth is that just another ‘idea’, which is conveyed to the perception of little creatures by their acute senses or to our mind by the microscope, is newly added to the collection of the already known properties which constitutes the thing. He affirms the existence of the unobservable microworld as long as it is not identified with the representationalist’s ‘real’ world which is supposed, by the very framework of ideal/real dichotomy, to be beyond the scope of perceptibility. Berkeley’s scheme of things accommodates the world of minute corpuscles as perceivable ‘ideas’, which may not be actually

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64 In the First Dialogue, Philonous drives Hylas to confess ignorance about the ‘true colour’ of sensible objects by reference to the perception of small animals and the microscope: ‘there actually are animals, whose eyes are by Nature framed to perceive those things, which by reason of their minuteness escape our sight’; ‘microscopes make the sight more penetrating, and represent objects as they would appear to the eye, in case it were naturally endowed with a most exquisite sharpness’ (DHP.185). The terms ‘by nature’ and ‘naturally endowed’ used here indicate that the perception of small animals and that by microscope are as real as the perception we have by naked eyes.

86
perceived by us but can be reasonably conceived as perceivable in the light of knowledge we have at present about the condition of perception. But since the minute parts of bodies thus conceived are 'ideas', they cannot be 'essence' or 'cause' from which their observable properties are derived. For, on the one hand, one idea cannot be the inner essence of another idea, since, as we have seen, it is the nature of ideas that they are 'perfectly known, there being nothing in them which is not perceived' (PHK.87). Therefore, it is impossible that the manifest quality present to us as an 'idea' at one moment have some unperceived 'idea' inside which may be perceived at another moment. All that constitutes an 'idea' is what is discernible in the present perception, and what is not discernible in it at the given moment is an entirely distinct being. On the other hand, since there is no causal efficacy included in 'ideas', the newly discovered scene of minute mechanical structure, being only another 'idea', cannot be the cause of the manifest qualities we observe by the senses. Thus, the discovery of the microworld does not advance our knowledge of observable qualities in the sense that it illuminates their causal origin: it still leaves us in the dark about their causal origin.

Hence, to endeavour to explain the production of colours or sounds, by figure, motion, magnitude and the like, must needs be labour in vain. And accordingly, we see the attempts of that kind are not at all satisfactory. Which may be said, in general, of those instances, wherein one idea or quality is assigned for the cause of another. (PHK.102)

Since 'in truth, there is no other agent or efficient cause than spirit' (Ibid.), if we are to be enlightened about the causal origin of manifest qualities, it is only when the explanation is made by recourse to God, 'the governing spirit' who is the cause of all ideas we perceive including those of

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the minute mechanical structure. The discovery of the microstructure of bodies advances our knowledge only in the sense that we come to know what other effects God is prepared to impress on the senses in different situations. But since the ideas of the microstructure of bodies are equal to their manifest qualities in the status of being effects, they require causal explanation as well.

Thus, according to Berkeley, our knowledge of the observable qualities of bodies manifested to the senses at the macro level is always perfect and complete: considered as one of those innumerable effects of God, they have no hidden essences or causal mechanism yet to be discovered. Therefore, concession to the fact that there are vast fields of the microworld hitherto unknown to us has no sceptical consequences about our knowledge of the manifest qualities of bodies we already have. What is actually present and perceived at the given moment is all that we could have to know about any qualities, considered as the immediate effects of God, and there is no room for later amendment, improvement, or correction for this knowledge. Of each quality of bodies, its presentation and being perceived is sufficient for the mind’s ‘perfect comprehension’, and thus in every perceptual situation we have “intuitive knowledge” of whatever qualities at once. What this Berkeleyian conception of perceptual knowledge of the world implies would undoubtedly seem idiosyncratic and very far from common conception. Our knowledge of the natural world is conceived, as it were, as an accumulation of the ‘intuitive knowledge of idea’ standing on its own. Since Berkeley characterized physical things as ‘collections of ideas’, the whole natural world would be the collection of such ‘collections’. Accordingly, our knowledge of things is to be conceived as ‘collections of knowledge of ideas’, each of which constituent is intuitive and perfect, and knowledge of the whole natural world, which is possessed by the omniscient God, would be the collection of such ‘collections’ of intuitive knowledge. This picture of knowledge does not allow that there can be a qualitative advancement in knowledge, in the sense that we come to know better and more about the same thing we formerly seemed to know. But the progress of knowledge
occurs only in quantitative respect: we have no more to know about what we take we already know, but we may further add knowledge about something entirely distinct from what we already know. On a closer look, however, it turns out that Berkeley’s picture of knowledge of nature cannot be as simple as this, as we are now going to see.

2. Ideas, things, and the laws of nature: the limited scope of Berkeley’s intuitionism

So far I have discussed the prominence of the intuitionist motif in Berkeley’s view of knowledge of nature which appears in his project of rebutting scepticism. To the external-world scepticism which arises in the representationalist framework, Berkeley responded (in sections 86-8 of the Principles) by insisting on intuitive knowledge of physical reality. So long as we retain the representationalist dichotomy of ideas and real things, we cannot avoid falling prey to scepticism about the existence of the physical world as is raised by Bayle. The key move of Berkeley in response to this kind of scepticism was to identify the whole physical reality with ‘ideas’. But there was another kind of scepticism threatening our claim of knowing physical reality, namely, the worry which arises from the recognition of the minute constitution of bodies which escapes our sense-perception but is supposed to be the essence or causal ground of all the phenomena directly appearing to the senses. Berkeley’s reply to this kind of scepticism (in sections 102-3) is to deny the microstructure of bodies the status of essence or cause of observable qualities and thereby make our ignorance about it entirely irrelevant to knowledge of observable qualities. Berkeley’s intended moral in both of these responses is that we are entitled to claim ‘intuitive knowledge’ of physical reality: we have wholly transparent cognition of the existence and nature of the objects presented to us and thus we enjoy ‘perfect knowledge’. But when we take a closer look into Berkeley’s claim of ‘intuitive knowledge’ of physical reality, we find limitations in the scope of its application. His insistence
about the advantage of his position that it enables us to have ‘intuitive knowledge’ of physical reality has an appearance of plausibility only because an important element of his conception of nature has been overlooked – ‘the laws of nature’.

In the preceding chapter we saw that Berkeley’s natural world contains two basic strata: ‘ideas actually imprinted on the senses’ and the ‘laws of nature’. Thus for Berkeley, physical things and the reality composed of them cannot just be a random assemblage of ‘ideas of sense’ but embodies the *orderly arranged structure*. His favourite expression for ordinary physical things, ‘collections of ideas’, or his talk about the whole physical reality as ‘the course of nature’, implies such orderliness of ideas. But once the essentiality of the concept of law or order for the Berkeleian natural world is recognized, the apparent force of Berkeley’s insistence that his position enables us to have ‘intuitive knowledge’ of the physical world cannot but be considerably reduced. For, if nature is not just an *assortment* of ideas but their *orderly arrangement*, it will be essential to our claim of knowledge of physical reality that we know not only its component ideas but how they are structured in a lawful order. In other words, we cannot be entitled to knowledge merely in virtue of knowing an idea actually present to us in isolation of the connection with other ideas but in virtue of knowing how the present idea is to be placed in the regular course of nature. However, what is noticeable about Berkeley’s way of refuting scepticism as is given in sections 86-8 of the *Principles* is that this point about the essentiality of laws in our knowledge of nature is kept entirely out of sight as if it had no relevance to his reply to scepticism. To be sure, Berkeley frequently refers to ‘the laws of nature’ in the *ontological* context, such as sections 34-6 where he is concerned to distinguish real things from imaginary ones. But in the *epistemological* context of responding to sceptics, i.e. in sections 86-8, he tends to set aside the significance of the regular order of ideas.

This neglect of ‘the laws of nature’ in the context of responding to scepticism would seem to trivialize Berkeley’s victory over sceptics and render the supposed advantage he claims over other
philosophers dubious. In the Preface to the *Three Dialogues*, he stated:

> Upon the common principles of philosophers, we are not assured of the existence of things from their being perceived. And we are taught to distinguish their real nature from that which falls under our senses. Hence arise *scepticism* and *paradoxes*. It is not enough, that we see and feel, that we taste and smell a thing. Its true nature, its absolute external entity, is still concealed.

According to representationalists, the existence and nature of things always remain concealed from our direct perception, and this view leads to ‘scepticism and paradoxes’. By contrast, Berkeley’s *esse-percipi* principle, by its identification of ideas and real things, restores our immediate contact with things by the senses and thus secures knowledge of the existence and nature of things. But there is a question that seems necessary to be asked at this point: what are the ‘things’ here spoken of? Undeniably, there is a fundamental ambiguity in Berkeley’s talk about ‘real things’, ‘sensible things’, or ‘unthinking things’, which I have not got into so far. It might be suggested that he only used the term ‘thing’ to denote each *separate* ‘idea imprinted on the senses’ given at each moment of experience. But this is obviously not the case; and the claim of ‘intuitive knowledge’ of the ‘things’ taken in this sense would not make a very impressive anti-sceptical achievement. Berkeley clearly needs to secure our claim of knowledge not only of individual ‘ideas’ but of ordinary physical things like apples, trees, books, etc. Thus in the *Three Dialogues*, Philonous replies to Hylas who accuses him of contradicting with the universal judgement of mankind that he actually affirms knowledge of *bodies* and thus is in close alignment with the vulgar position:

> I do ... assert that *I am as certain as of my own being, that there are bodies or corporeal substances (meaning the things I perceive by my senses)*, and granting this, the bulk of mankind will take no thought about, nor
think themselves at all concerned in the fate of those unknown natures, and philosophical quiddities, which some men are so fond of. (DHP:238; my italics)

But once physical things or bodies are thus brought in to the stage, Berkeley's response to scepticism cannot remain as simple as it first appeared. For, if bodies are 'collections of ideas', knowing them must involve knowing 'laws of nature' besides 'ideas'; and laws of nature, unlike individual ideas, are not such objects that we may have 'intuitive knowledge' of. Nevertheless, for the most part Berkeley seems to feel free to shift immediately from the level of 'ideas' to the level of physical things in his discussion of knowledge of 'real things', as if he sees no difference between ways of knowing 'things' at these two levels; and indeed, in the above passage which compares knowledge of bodies with that of 'my own being', he may well be taken to be claiming to have 'intuitive knowledge' of physical things or bodies.

In the Three Dialogues, however, there are several points at which Berkeley comes nearer to acknowledging the difference between knowing just 'ideas' and knowing physical things or bodies in which the regular order of ideas is involved. The most prominent place to see this is the third dialogue passage where Hylas demands that Philonous account for perceptual errors. Interestingly, this passage immediately follows the one in the third dialogue we have just seen where Philonous claims that he is as certain of the existence of bodies as of his own being. The account of perceptual knowledge given here is more complex than the intuitionism we have seen so far. The problem of perceptual errors is what every theory of perception needs to countenance, so Hylas asks:

HYLAS. What say you to this? Since, according to you, men judge of the reality of things by their senses, how can a man be mistaken in thinking ... an oar, with one end in the water, crooked?

PHILONOUS. He is not mistaken with regard to the ideas he actually perceives; but in the inferences
he makes from his present perceptions. Thus in the case of the oar, what he immediately perceives by sight is certainly crooked; and so far he is in the right. But if he thence conclude, that upon taking the oar out of the water he shall perceive the same crookedness; or that it would affect his touch, as crooked things are wont to do: in that he is mistaken. (DHP.238)

Clearly, Berkeley cannot find the way to explain perceptual errors as long as he remains within simple intuitionism. For God, who comprehends all ideas of sense at once by ‘intuition’, no error can possibly occur. But it is an undeniable fact that we make mistakes in perceptual experience, and Berkeley does not want to go so far as to claim that we never err in perception in any sense. How then do perceptual errors occur? In answer to this, Berkeley never alters the point that there can be no error about what is actually present and perceived: we have ‘intuition’ of the idea present to us, namely, of a visual appearance of the crooked-oar-in-water, and the knowledge we have of this presently perceived idea – that it exists and has such and such contents (bent figure, black colour, etc.) – is infallible. But our normal perceptual experience generally goes beyond this: we infer, on the basis of the intuition of the present idea, that some such and such ideas which are not present to us at the moment will be perceived if we change the situation. Here occur perceptual errors. But this is not mistaking about ideas but about the connections of ideas. Thus Berkeley states: ‘his mistake lies not in what he perceives immediately and at present (it being a manifest contradiction to suppose he should err in respect of that) but in the wrong judgment he makes concerning the ideas he apprehends to be connected with those immediately perceived’ (Ibid.: my italics).

Now in this account of perceptual error, Berkeley does not compromise the fundamental point of his refutation of scepticism, that is, his rejection of the representationalist dichotomy of ideas and real things, which he considered ‘the very root of scepticism’. We err in perceptual experience not because we take the object only appearing so-and-so to us to be really so-and-so in itself when it
actually is not the case. This representationalist analysis of perceptual errors introduces the ‘twofold existence’ of an object of sense, drawing the line between ever changing appearances of a thing and the fixed nature it has in itself. But for Berkeley, there are no such fixed criteria of reality or permanent natures by reference to which varying appearances we encounter in perception are verified or falsified. In the ‘oar’ example given above, those ever changing appearances, such as a visual appearance of the-crooked-oar-in-water, a visual appearance of the-straight-oar-outside-water, and a tactual appearance of the-straight-oar-in-water, are all genuine realities standing on their own; they require no reference outside themselves for the authorization of their reality. Going through those varieties of appearance in a series of experience which we take as the experience of an ‘oar’, we just have one reality which constitutes the ‘oar’ at one present moment and then, as it were, jump to another entirely distinct reality in the next which also constitutes the ‘oar’. Therefore, every individual appearance or ‘idea’ that we have of a physical thing, such as an ‘oar’, when it is considered only a single perception at the present moment in a given situation, is epistemologically self-sufficient: the one present perception of an idea will never be corrected by the perception of other ideas which is ‘truer’ than it, nor will it be judged by reference to some original quality which underlies all perceptions and which has the claim of the ultimate reality.

But such strict egalitarianism about the epistemic value of each sensory appearance does not explain how perceptual error is possible. And clearly, Berkeley’s attempt to account for perceptual error in the third dialogue is not a mere performance of accommodating common sense in his scheme of things. While rejecting the common belief in ‘one single, unchanged, unperceivable real nature’ (DHP.245) which is allegedly denoted by the names of physical things (such as ‘oar’), Berkeley is still deeply committed to the view that there is one unified, underlying reality distinct from ideas or appearances – ‘the laws of nature’ which he calls ‘fixed’ and ‘constant’ – with which we are constantly confronted with throughout our perceptual experience. So by reference to this
fixed underlying reality, we can be said to err in a genuine sense in perception. While there is no one ‘absolute’, ‘true’ nature (e.g. the nature of an oak as invariably ‘straight figured’) by reference to which each individual perception in the given situation is verified or falsified, there are the fixed, constantly applicable ‘laws’ by reference to which the expectation about the future course of perception we have from the present perception is to be confirmed or disconfirmed. But once this is acknowledged, a representational structure, and together with it the appearance/reality distinction, are introduced in Berkeley’s scheme of things: the expectation we have about the connections of ideas from the present perception is a representation of the connections we experience in the future.

At this point a double structure of our perceptual experience is introduced between the real standing order of ideas (the laws of nature) and their orders we take to be standing (in the form of ‘judgement’, ‘inference’, or ‘suggestion’), and this double structure in our perception of a system of orderly connection subjects us to the possibility of error.

Thus in the *Three Dialogues*, the essentiality of ‘the laws of nature’ in Berkeley’s picture of perceptual knowledge comes to the fore through consideration of perceptual errors, and here he is obliged to trade on some representationalist framework which is vulnerable to sceptical doubts. Though this does not necessarily mean that Berkeley should fall prey to scepticism in the same way he thought his rival philosophers did, it would at least mean that his response to scepticism needs to be conducted more subtly than that simple appeal to ‘intuition’ we have seen above. Once it is

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66 In *Berkeley’s Revolution in Vision*, Margaret Atherton suggests that Berkeley integrates the laws of nature into his response to scepticism: ‘the identification of things with ideas is not the whole of Berkeley’s solution to the problem of scepticism. Berkeley’s theory of space perception, as developed in the *New Theory*, shows he has more to offer as a refutation of skepticism than the identification of things with ideas’ (p.237). If we interpret Berkeley’s argument as directed against Cartesian theory of space and material essences, which entails scepticism about sensory function, we can see, Atherton observes, how he effectively refuted scepticism by constructing a theory of representation according to which we can learn the laws of nature through the senses. As space is successfully seen by learning the regular connection between ideas of sight and touch, knowledge of the nature of things is ‘a matter of including events and processes under laws of increasing generality’ (p.239). Although this is an interesting reconstruction, it seems to me that Berkeley
admitted that knowing the order of ideas comprises an essential part of perceptual knowledge, it is no longer adequate to claim that we have transparent cognition of the existence and nature of ideas which constitute physical things and that our knowledge of them is infallible: we are entitled to claim knowledge of physical things when we know ideas and the laws they are subject to. But clearly, we are in no position to have ‘intuition’ of the regular order of ideas. God may well have such knowledge since it is he that wills the laws and he surely knows his own will directly and at once, but we have no other way of knowing these laws of God’s institution than by gradual learning through experience, observing successions of ideas and discerning the recurrent orders in them. To be sure, such lawful orders of ideas, unlike the material reality of representationalism, are not something beyond the scope of our experience. But since this knowledge of laws is based on the limited scope of our past experience, we cannot claim completeness about it: what we take as the ‘true and real’ orders holding between ideas at present is always subject to the correction by future experience. Here is no such absolute certainty available as that we are said to have in ‘intuitive knowledge’ of ideas. It follows, then, that Berkeley’s claim that we have ‘intuitive knowledge’ of physical things has only a limited scope of application, being confined to the level of knowing the ‘ideas’ present at each moment of our experience. But nowhere in his writings does Berkeley show sensitivity to a possible sceptical worry about knowledge of laws.

In a significant entry in the notebooks, Berkeley noted: ‘All our ideas are adequate, our knowledge of the Laws of nature is not perfect & adaequate’ (PC. 221). This indicates that Berkeley was aware from the very early stage that knowledge of ‘ideas’ and knowledge of ‘laws’ require separate treatment. Putting this entry in the present context of knowledge of physical things, he should have noticed that his case against scepticism needs to be made at two different levels. Neither in the subsequent part of the notebooks nor in the published works, however, does he needed a stronger position, i.e. intuitionist one, in his disposal of scepticism, as I argue below.
develop the implications of the above note for his project of refuting scepticism. In sections 86-91 of the *Principles*, Berkeley makes no attempt to correlate the problem of how we know the laws that combine individual ideas into a physical thing with his response to scepticism. Drawing the consequences of his immaterialist principles for epistemology, the central section 87 begins with the remark that ‘colour, figure, motion, extension and the like, considered only as so many *sensations* in the mind, are perfectly known’. This sentence obviously corresponds to the first half of the above quoted notebook entry. This opening remark is followed, however, by the observation that ‘if they are looked on as notes or images, referred to *things* or *archetypes* existing without the mind, then are we involved all in *scepticism*’. What is significant about this passage is that Berkeley concentrates only on the function of ideas as representations of external archetypes, which he takes to lead to scepticism because of the impossibility of confirming the supposed correspondence:

What may be the extension, figure, or motion of any thing really and absolutely, or in it self, it is impossible for us to know…. Things remaining the same, our ideas vary, and which of them, or even whether any of them at all represent the true quality really existing in the thing, it is out of our reach to determine. So that, for aught we know, all we see, hear, and feel, may be only phantom and vain chimera, and not at all agree with the real things, existing in *rerum natura*. All this scepticism follows, from our supposing a difference between *things* and *ideas*, and that the former have a subsistence without the mind, or unperceived. (PHK.87)

Now, since physical things for Berkeley are ideas of sensible qualities which are collected into one distinct thing according to certain laws, as is stated in section 1 of the *Principles*, we naturally expect him to have something to say about where knowledge of them falls between perfect knowledge of sensible ideas that constitute physical things and total ignorance of their external archetypes. And yet nowhere in sections 86-91 does he seem to think it necessary to account for
knowledge of physical things in addition to what he says about perfect knowledge of the ideas considered each by themselves. In these sections Berkeley speaks about ‘unthinking things’, ‘unthinking beings’, ‘sensible objects’, and philosophers’ ridiculous doubts about their existence and nature, but throughout his discussion he keeps silent about ‘laws’ or its cognate terms. In light of the notebook entry we have seen above, this silence appears strange.

The strange omission of reference to the laws of nature at the crucial point can be observed about the Three Dialogues as well. Consider the following passage near the end of the third dialogue where Berkeley tries to put forward the essential point of his response to scepticism.

HYLAS. ... after all, Philonous, when I consider the substance of what you advance against scepticism, it amounts to no more than this. We are sure that we really see, hear, feel; in a word, that we are affected with sensible impressions.

PHILONOUS. And how are we concerned any farther? I see this cherry; I feel it, I taste it: and I am sure nothing cannot be seen, or felt, or tasted: it is therefore real. Take away the sensations of softness, moisture, redness, tartness, and you take away the cherry. ... Thus when the palate is affected with such a particular taste, the sight is affected with a red colour, the touch with roundness, softness, &c. Hence, when I see, and feel, and taste, in sundry certain manners, I am sure the cherry exists, or is real; its reality being in my opinion nothing abstracted from those sensations.

In view of this passage, it is inevitable to suspect that Berkeley overlooked the relevance of knowledge of laws in his response to scepticism; or even that he deliberately tried to circumvent the complexities he would have been confronted with if he had referred to laws. It seems quite clear that knowledge of a physical thing like a cherry cannot simply consist in perceiving one aspect of it given at the present moment as an ‘idea’: a cherry is a ‘collection of ideas’ whose constituents are
not present to be perceived by us all at once. And Berkeley repeatedly affirmed that what is meant by ‘real existence’ is not just that an ‘idea’ or several of them are given at the moment as isolated sense impressions but also that they are given to us in temporal succession according to a certain identifiable regular order. Therefore, knowing or being certain that a cherry really exists involves ascertaining that the particular ‘redness’ I now see is to be placed in a certain regular course of experience I will follow in the future. But in the above passage, the question about the representational structure involved in this knowing ‘real existence’ of a cherry is scarcely addressed. Thus it looks, in both the *Principles* and the *Three Dialogues*, Berkeley prefers to offer a much simpler and more impressive solution to scepticism than that he actually needs to offer.

In the above passage of the dialogue, however, Berkeley might have thought it unnecessary to render his reply to sceptics complicated by the introduction of ‘the laws of nature’. All that he needs to establish in this context is that an immaterialist is in a secure position to affirm that we have at least *some* knowledge of physical things while a representationalist is not entitled to claim even such a limited scope of knowledge. For the immaterialist Berkeley, a cherry is just a collection of ideas and each idea constituting the cherry-collection has no reference to the external archetype which is to verify or falsify our perception of it. Thus, although our perception of the cherry at each moment is admittedly restricted to a very small part of the infinite variety of ideas which comprises the whole collection, this does not detract the point that we know the cherry’s redness or softness or sweetness which is perceived at the moment: when we perceive one or several of the ideas belonging to the cherry-collection, the ideas of the cherry we presently perceive are not nothing but something real. But by contrast representationalists are not in the position to claim *any* knowledge about the cherry. This is because they suppose that ideas we perceive are true and real insofar as they correspond to their original patterns lying outside our perception. Since there is no way to confirm such correspondence, we cannot be certain about the truth and reality of whatever ideas we
perceive; consequently, we are forced to concede to sceptics that we know nothing about the cherry. It is not necessary, then, for Berkeley to introduce the laws of nature in this dialectical context where he aims only to establish his advantage over representationalists at the fundamental level of knowing the part of physical things we actually perceive. As to the question about how far we can enlarge knowledge of physical things by acquisition of knowledge of laws, immaterialists and representational materialists would have to countenance the same problem, since the latter is far from affirming that we perceive all the qualities of physical things at once.

But Berkeley would certainly not be content with showing his dialectical advantage over representationalism. As he declares in the Preface to the *Three Dialogues* that 'atheism and scepticism will be utterly destroyed' by acceptance of the immaterialist principle, his ultimate aim is to provide a *thorough* refutation of scepticism. Since Berkeley acknowledges that the majority of the ideas that constitute a physical thing are not present to be perceived by us and that we know only gradually the connections of the constituent ideas by learning through experience, sceptics will have ample opportunity to raise 'philosophical doubts' about our perceptual knowledge of physical things within the Berkeleian ontological scheme. As I have noted, this would not necessarily mean that Berkeley is vulnerable to the same difficulties that representationalists have about the alleged knowledge of the external physical things. His scheme of things admits no archetypal 'true' qualities of things that verify or falsify our perception of individual ideas; accordingly, there arises no worry about the confirmation of correspondence between two realms, which is never attainable. But his system contains the fixed, constant 'laws of nature' by which our expectation about the order of perception is confirmed or disconfirmed; and our perceptual knowledge of physical things depends on the correctness of such expectations about the course of nature. Here a kind of representational structure and the appearance/reality distinction are introduced in the Berkeleian scheme of things. We expect, then, that he points to where knowledge of physical things is to be
placed between perfect knowledge of individual sensible ideas and total ignorance of their external archetypes. But nowhere in the *Three Dialogues* (and in the *Principles*) is no such attempt to locate knowledge of things in the gradation of certainty forthcoming. As I have noted, this prompts us to conjecture that he wanted to locate it on the same level as 'intuitive knowledge' of individual ideas. This conjecture would explain why Berkeley could believe he had provided a through refutation of scepticism, but it does not cohere with what he says about the perception of physical things, which implies a kind of representational structure and thus is far from 'intuitive'.

But however impressive his response to scepticism by appeal to 'intuition' might appear, Berkeley could hardly rest content with it. For, as the above passage discussing the problem of perceptual error shows, he firmly commits himself to the existence of a fixed underlying reality in nature - 'the laws of nature' - with which we are presented through our experience of ever changing ideas. The natural world we live in is, taken as a whole, the effect of a powerful intelligent spirit, God. Can living in such a world be just a matter of going through realities one by one? The insistence on 'intuitive knowledge' of physical reality, in which we enjoy infallibility, took Berkeley to the strict egalitarianism about the epistemic value of all perceptions: every perception of an idea is true and real without exception. But this reduces the world to an aggregate of discrete realities. Then, what becomes of Philonous' appraisal of God’s creation, in which it was observed: ‘So fixed, so immutable are the laws by which the unseen Author of Nature actuates the universe’ (DHP.210)? The tension between two notions of 'reality' comes to surface in Philonous' last reply to sceptics.

... can you produce so much as one argument against the reality of corporeal things, or on behalf of that avowed utter ignorance of their natures, which doth not suppose their reality to consist in an external absolute existence? Upon this supposition indeed, the objections from the change of colours in a pigeon's neck, or the appearances of a broken oar in the water, must be allowed to have weight.
But those and the like objections vanish, if we ... place the reality of things in ideas, fleeting indeed, and changeable; however not changed at random, but according to the fixed order of Nature. For herein consists that constancy and truth of things, which secures all the concerns of life, and distinguishes that which is real from the irregular visions of the fancy. (DHP258)

These statements by Philonous near the end of the *Three Dialogues* are curious in that his talk about reality shifts away from one level to the other in the middle. The decisive antidote to scepticism is to identify physical reality with ever changing appearances, ‘to place the reality of things in ideas’. But this time Philonous does not stop here. As if he has taken notice that this move would get rid of not only sceptical worries but also the stability of physical reality by reducing the world we live in to the stream of realities which are ‘fleeting and changeable’, Philonous quickly transfers his talk to ‘the fixed order of Nature’ which is also an essential component of physical reality: he observes that the ‘constancy and truth of things’ is guaranteed by this fixed order and therefore that our experience of the world is always the experience of one unified reality. While this new move would require him to develop his reply to scepticism further, he quickly closes his reply at this point. But if two notions of reality are applicable to the phenomenal natural world, it would seem inadequate only to observe that in his system the criterion of reality has been shifted back from the realm of ‘external absolute existence’ to the realm of ‘ideas’.

3. Intuition, foresight, and the benevolence of God

In section 1, I observed that Berkeley’s project of refuting philosophical scepticism was developed on the intuitionist motif he inherited from the Cartesian epistemological tradition. To the sceptical challenge which rests on the representationalist dichotomy of ideas and real things, Berkeley tried
to block the route to sceptical conclusions by eradication of its source, namely ‘the twofold existence of the object of sense’: physical things are nothing different from ‘ideas’. Therefore, whenever we perceive ‘ideas’ presented to us by the senses, it amounts to knowledge of reality. Our perception of ideas is always true and real, since there are no ‘real external’ criteria by reference to which they need to be verified or falsified. The perception of present ‘ideas’, in which we have ‘intuition’ of the existence and nature of the object, constitutes knowledge of physical reality. Moreover, another specific sceptical worry which may arise from consideration of our ignorance about the minute mechanical structure of physical reality is subverted by rejection of the presumed ontological dependence of the directly perceived phenomena upon the insensible microstructure: they are two distinct objects, and are equally inert ‘effects’ God creates in our mind; hence knowing the one never completes our knowledge of the other. Thus, each of our perception of things is self-sufficient, having no such criterion of reality outside itself, as the eternally unperceivable matter of representational materialists or the causal mechanism of essentialist corpuscularians. Each perception we have provides us with ‘intuitive knowledge’ of physical reality.

But as we saw in section 2, if we take into account another essential component of Berkeley’s real physical world, ‘the laws of nature’, it turns out that his claim about ‘intuitive knowledge’ of physical reality actually has only a limited scope of application. Since the real world for Berkeley is not just an amass of ideas randomly excited one after another but is the orderly ‘course of nature’ regulated by God, ‘whose will constitutes the laws of nature’, it seems we are entitled to knowledge of the physical world when we know the laws of nature and thus are able to place individual ideas in the regularity of nature. But while we may plausibly claim to have ‘intuitive knowledge’ with regard to the ideas actually present to us, this cannot apply to knowledge of ‘the laws of nature’. As Berkeley himself acknowledged earlier in the notebooks, even if our knowledge of individual ideas is always complete, our knowledge of laws that regulate ideas will remain incomplete. It is only
God who has complete knowledge of them. But then, this incomplete nature of knowledge of laws may well infect our claim of knowing ordinary physical things, since knowing them involves knowing how the present ideas we perceive are to be ‘connected with’ other ideas by the laws of nature God established. If we are said to expect the connection of ideas, a representational structure is brought in to the scene of perception. But Berkeley never clearly formulates the difference in cognitive process between the levels of knowing ideas and knowing physical things, and prefers to provide a very simple and impressive answer to scepticism about knowledge of physical reality: we know ‘things’ intuitively (at whatever levels) by perceiving their constituent ‘ideas’.

In the preceding chapter I, ‘intuitive knowledge’ has been contrasted with another model which I called ‘predictive knowledge’. I reproduce here the formulation of that model of knowledge:

*Predictive knowledge:*

The objects of predictive knowledge are the *connections* of ideas, or the relations of *signs with the signified*; the way we have this knowledge is not by perceptual apprehension of the actually present, but by acquiring the *ability* of using the present ideas of sense as *signs* of the non-present ideas to be perceived in the subsequent course of sensory experience – the ability of judging the non-present by the present, on the basis of the observation of their lawful connections, so that by such judgement the mind would extend cognitive compass from the present to the non-present objects.

In section 31 of the *Principles*, Berkeley speaks of this knowledge as ‘foresight’, which we acquire ‘by the observation of the settled laws of Nature’. Thus he develops in the *Principles* non-intuitive kind of knowledge in the form of predictive knowledge or ‘foresight’, which is particularly applicable to the account of knowledge of ‘the laws of nature’. When in the *Three Dialogues* Philonous tried to account for perceptual errors, he was drawing on this second model of
knowledge: perceptual error in the ‘oar’ case was explained as the failure in ‘predictive knowledge’, i.e. as the incorrect judgement about the relation of a ‘sign’ with the thing signified. It is clear that this predictive knowledge is fallible and subject to corrections by later experience. Moreover, and this is to put its fallibility in another way, it is incomplete. For, even if our foresight on the basis of the presently perceived signs came out successfully so far, it always remains possible that the idea we take as the same ‘sign’ might be followed by the idea(s) different from the one(s) we have interpreted as ‘the signified’. When such a predictive failure occurred, Berkeley would not think God had changed the laws of nature; for he thinks they are fixed and constant. Rather, he would think that the predictive failure is due to the incompleteness of our ‘observation of the settled laws of Nature’. The laws of nature are constantly standing before us, and we endeavour to improve our understanding of them by further development of our predictive ability.

In the Three Dialogues, Berkeley does not explicitly employ the term ‘sign’ nor ‘foresight’. But he may be taken to be alluding to it when he speaks of knowledge of ‘the connexion of ideas’ in reply to Hylas’ charge that the immaterialist has changed the familiar world of real things into mere discrete appearances. In the immediately preceding exchange, Philonous claimed that contrary to Hylas who takes ideas of sense to be ‘empty appearances’ he regards them as ‘the very things themselves’. In response to this Hylas observes that Philonous’ move to qualify all sensible ideas as real things is at odds with the common sense view that there is only one true quality, e.g. figure, in physical things while there are many apparent figures which fail to represent the true one. We try to specify better sensory conditions or use microscopes to discover the true quality of a thing, and this indicates that we do not take every appearance to be a real thing. Philonous’ reply is as follows:

Strictly speaking, Hylas, we do not see the same object that we feel; neither is the same object perceived by the microscope, which was by the naked eye. But in case every variation was thought
sufficient to constitute a new kind or individual, the endless number or confusion of names would render language impracticable. Therefore to avoid this ... men combine together several ideas, apprehended by divers senses, or by the same sense at different times, or in different circumstances, but observed however to have some connexion in Nature, either with respect to co-existence or succession; all which they refer to one name, and consider as one thing. Hence it follows that when I examine by my other senses a thing I have seen, it is not in order to understand better the same object which I had perceived by sight, the object of one sense not being perceived by the other senses. And when I look through a microscope, it is not that I may perceive more clearly what I perceived already with my bare eyes, the object perceived by the glass being quite different from the former. But in both cases my aim is only to know what ideas are connected together; and the more a man knows of the connexion of ideas, the more he is said to know of the nature of things. (DHP.245-6)

Here Berkeley proposes to replace the ‘thing’-account by the ‘connexion’-account to make sense of the improvement of our knowledge of physical things: knowing better about physical things does not consist in discovering a privileged idea or appearance we obtain through a certain sense in a certain condition or by a certain instrument, which best represents the true quality of things: but it rather consists in knowing more of ‘the connexion of ideas’. As he refers to the connection between ideas of sight and touch he discussed in the New Theory, he can be taken as developing the model of knowledge which I formulated as ‘predictive’. In the Three Dialogues, then, Berkeley can be understood to be speaking of predictive knowledge based on the sign-signified connections of ideas when he explains the improvement of knowledge of physical things.

Now our question has been whether his introduction of predictive knowledge, which has a kind of representational structure, would not necessitate Berkeley to develop his refutation of scepticism in a more subtle way than the appeal to intuition of ideas. Predictive knowledge, as I noted above,
never affords such infallibility and completeness as intuitive knowledge does. But in the passage quoted in the previous paragraph, Berkeley may be interpreted as putting forward his reply to scepticism as is concerned with predictive knowledge. According to the passage, the progress in knowledge of physical things should be conceived in terms of a gradual accumulation through experience of knowledge of ‘the connexions of ideas’ under varying conditions. We will be equipped with the more reliable predictive ability in us as we ‘combine together several ideas, apprehended by divers senses, or by the same sense at different times, or in different circumstances, but observed however to have some connexion in Nature, either with respect to co-existence or succession’. Our predictive knowledge about the future course of experience which starts from the present perception is representational, and as such it is fallible and incomplete. But nevertheless we can enhance the reliability of our predictive ability and thus improve it bit by bit towards perfection. Drawing such a picture of the progress through empirical accumulation, Berkeley would be able to make our claim of knowledge of the nature of things securer than the rival representationalists. For, while the correspondence between the true nature of things and our ideas can never be discovered, our prediction is confirmed or disconfirmed in the actual course of experience. Berkeley’s reply to sceptics in defence of predictive knowledge of the laws of nature, therefore, would be this: though we will never have complete knowledge of laws which enables us to predict in all the circumstances relevant to perception of a physical thing, this never means that we cannot have any knowledge of them; we have reasonably reliable knowledge of the connections of ideas involved in perception of physical things, and the reliability of the knowledge can be increased as we gradually accumulate experience of predictions and confirmations.

It is true that a reply to scepticism about predictive knowledge of laws along the line described above was available to Berkeley. But it seems that this line of defence of predictive knowledge will necessarily lead Berkeley to conceive knowledge in terms of reliability which admits of the degrees
more or less. While intuitive knowledge of the ideas actually present to the mind is absolutely certain and leaves no room for sceptical doubts, predictive knowledge is clearly different from it. Having a set of sensible ideas before us, our prediction about the future course of perception, however long we are engaged in predictive practice, is fallible: it is always conceivable that every familiar sensible appearance that we interpret as a ‘sign’ may involve, unknown to us, some special circumstance which should alter our judgement about the ideas signified by the present appearance and thus disconfirm the prediction made in accordance with the connection learned in the past experience. It is true that numerous instances of perceptual errors can teach us the better regulation of our judgement about the future course of experience. And as we learn more about the different circumstances which apply to perception of a similar set of ideas, our predictive ability will become more reliable. But this will never exclude the possibility that our prediction fails due to some still unfamiliar condition involved in the present perceptual situation. Examples of such predictive failure can be easily created in the optical illusions. (Berkeley knows well the Barrovian case of distance illusion and the case of looking glass.) It would be impossible for us to be equipped with the ‘perfect’ predictive knowledge which comprehends all the connections of ideas corresponding to all the possible circumstances relevant to perception of a physical thing. But if our prediction, however reliable it may have been so far, cannot be absolutely certain, then a sceptic will be able to raise doubts about every judgement we make from the present perception.

Thus the recourse to empirical accumulation and the ‘reliability’ resulting from it in defence of predictive knowledge still stops short of making it exempt from sceptical challenges. It seems impossible, after all, to accomplish a thorough refutation of scepticism, and Berkeley ought to have set his goal lower than that he proposed: instead of aiming at the complete destruction of scepticism, he should have just claimed that the acceptance of his immaterialism would lessen the power of sceptical challenge by showing the way to secure our claim of knowledge of physical reality
through the empirical learning of the connections of sensible ideas under the varying circumstances.

A refutation of scepticism in such a direction was indeed available to Berkeley within the Cartesian epistemological framework: instead of seeking absolute certainty, he could be content with reasonable certainty, or moral certainty, which was familiar to early modern philosophers, to dispose of sceptical worries. In order to see the manoeuvre available to him, it would be instructive to turn to Descartes’ text and see what he says about ‘moral certainty’. According to Descartes in the *Principles of Philosophy*, being ‘morally certain’ means ‘having sufficient certainty for application to ordinary life’. Or, as he put it in more detail in the French edition,

… moral certainty is certainty which is sufficient to regulate our behaviour, or which measures up to the certainty we have on matters relating to the conduct of life which we never normally doubt, though we know that it is possible, absolutely speaking, that they may be false.  

In the *Discourse on Method*, ‘moral certainty’ was opposed to ‘metaphysical certainty’, by which Descartes may well have meant ‘absolute certainty’ which could survive even that so called ‘hyperbolical doubts’ of the *Meditations* – or in other words, absolute certainty, which was yielded by ‘intuition’ or ‘demonstration’, as we saw at the beginning of this chapter. As is well known, the existence of particular bodies perceived by the senses is made the primary target of Cartesian doubt in search for the absolutely certain foundation of knowledge, but in the context of ordinary life and regulation of actions, where ‘the pressure of things to be done does not always allows us to stop’,

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69 To be exact, Descartes in the *Meditations* holds that ‘intuition’ is by itself not sufficient to overcome the ‘hyperbolical doubt’ which culminates in the hypothesis of an omnipotent deceiver. Except the case of knowing the existence of the self which thinks at the given moment, even intuition requires the guarantee of God’s veracity. Thus absolute certainty is called ‘metaphysical certainty’ which has ‘metaphysical foundation’ in God (see Part IV, art.206 of the *Principles*).
Descartes thinks ‘moral certainty’ is all that we need for certainty of their existence.

Now it may well seem that since what Berkeley considers to be the chief function of predictive knowledge is to ‘enable us to regulate our actions for the benefit of life’, he need not go so far as to claim ‘absolute certainty’ for its vindication. What is actually needed to be confirmed about it is that it works well for the most part: our prediction is secure enough to the extent that all those interests we pursue in everyday practice are generally satisfied by possession of it. Predictive knowledge at the everyday level, which teaches us ‘to obtain such or such ends, such or such means are conducive’, is fallible and incomplete, as I have discussed above, and it is always subject to corrections and revisions. But even though our knowledge of ‘the settled laws of nature’ cannot be complete and hence our everyday predictive judgements may ever remain ‘rules of thumb’, it still ‘measures up to the certainty we have on matters relating to the conduct of life’; then, ‘we never normally doubt, though we know that it is possible, absolutely speaking, that they may be false’, as Descartes remarked. Thus, while Berkeley may not be able to meet scepticism by the claim of absolute certainty of ‘intuition’, a reasonably acceptable answer would have been available to him by appeal to moral certainty. Since knowing the existence of ordinary physical things like an ‘oar’ or a ‘cherry’ is the matter of knowing how the present idea is to be connected with the other ideas we will perceive in the subsequent course of experience, he could claim that predictive knowledge of laws relevant to the perception of physical things is ‘morally certain’. But Berkeley himself seems to think scepticism must be answered by claiming absolute certainty of ‘intuition’.

Consider the way Descartes dealt with the problem of knowledge of physical things. As it is well known, Cartesian answer takes different ways with respect to knowing the ‘nature’ of bodies and with respect to knowing their ‘existence’. Concerning knowledge of the nature of bodies, Descartes quite optimistically claims that we have clear and distinct ideas – ‘intuitive knowledge’ –

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70 Meditation VI, Descartes, op. cit., p.122.
of extension as well as of our thoughts. But as for the existence of bodies, though he may be taken as sufficiently optimistic in this point insofar as he believes it is demonstrable, he held that we are only ‘taught by nature’ to believe that bodies exist in the external world: there can be no ‘intuitive knowledge’ of the existence of bodies available to us, but we only believe in their existence because God implanted in us a strong inclination to do so; and since He is not a deceiver, we are justified in this belief. Thus concerning knowledge of existence, there is a clear asymmetry between bodies and our own mind: we know the existence of our own mind with intuitive certainty which is immune even to the deception of an omnipotent deceiver. Thus in the earlier part of the Meditations the certainty of the existence of the self is established first in spite of the most extravagant hypothesis of the deceiving God, but the certainty about the existence of things in the external physical world is proved at the very last, even later than the confirmation that we have certain knowledge of the ‘nature’ of physical things. It is the central feature of Cartesian philosophy that certainty about the existence of bodies is cast into doubt at the very beginning but is rescued from doubt at the very last stage. And the certainty thus restored at last is, after all, nothing more than that ‘moral certainty’ which we had before the start of Cartesian doubt – except that such moral certainty is now metaphysically guaranteed by God’s veracity.

We have seen, at the beginning of this chapter, how Berkeley reacted to such Cartesian disparity between knowledge of the existence of self and that of the existence of physical things: he strongly demanded the parity between self-knowledge and knowledge of physical things. In a passage of the Three Dialogues, Philonous disdains the Cartesian doubt about sensible objects: ‘What a jest is it for a philosopher to question the existence of sensible things, till he hath it proved to him from the veracity of God: or to pretend our knowledge in this point falls short of intuition or demonstration?’ (DHP.230). The latter half alludes to Locke who was content with claiming ‘sensitive knowledge’

71 Meditation VI, Descartes, op. cit., p.116.
about the existence of physical things: it provides us with ‘an evidence that puts us past doubting’ without amounting to intuitive or demonstrative certainty. But as we saw in section 1, Berkeley is confident that he is far more advanced in the battle against sceptics than ‘Locke or any other philosophers’. This confidence would be puzzling if he thought ‘moral certainty’ sufficiently met sceptical challenge. In section 3 of the *Introduction* to the *Principles*, he insists, against the alleged ‘natural weakness and imperfection of our understandings’, that God should have made our faculty originally without blemish so that we can successfully attain knowledge by the right use of it:

... God has dealt more bountifully with the sons of men, than to give them a strong desire for that knowledge, which he had placed quite out of their reach. This were not agreeable to the wonted, indulgent methods of Providence, which, whatever appetites it may have implanted in the creatures, doth usually furnish them with such means as, if rightly made use of, will not fail to satisfy them.

The thought expressed here is that it would do injustice to the benevolence of God to suppose that our cognitive faculty is so defective that it keeps us from knowledge about such matters of our basic concern as knowing the circumstantial physical world and thus are perpetually threatened by sceptical worries. To acknowledge that the best evidence for our knowledge of the real world derives from either Cartesian ‘natural inclination’ or Lockean ‘sensitive knowledge’ (as Descartes and Locke acknowledged, neither of these entitle us to claim ‘knowledge’ in its most proper sense), is, for Berkeley, a scandal for theodicy. And it would go without saying that Malebranche’s appeal to Scriptural revelation to justify our belief in the real physical world appeared too far-fetched to his eyes. But if, instead, our faculty of sense is proved to be made by God so that it is capable of ‘intuitive knowledge’ about physical reality which gives us the highest certainty with the greatest

73 Malebranche, *Search*, Elucidation VI.
conceivable evidence, this will do maximum justice to God’s beneficence.

But it seems undeniable after all that Berkeley’s response to sceptical challenge ends up in either a trivial victory or a retreat to moral certainty. He may well insist on ‘intuitive knowledge’ of those particular sensible ideas present to us at each moment of experience, in which we are entitled to claim to have a perfect, complete knowledge of the objects. But unfortunately, such a claim of perfect knowledge is applicable only to the objects of a very restricted scope; and therefore, the defeat of scepticism that has so limited an application would not appear a very impressive achievement. On the other hand, predictive knowledge, or ‘foresight’, covers the objects of much wider scope, but it is hard to understand how he could conceive this second type of knowledge can approximate to intuitive knowledge. It is interesting, however, to note that there is one passage in the *Principles* where Berkeley refers to predictive knowledge of the future course of experience as ‘sure and well grounded’ though it never amounts to the absolute certainty of intuitive knowledge.

We may, from the experience we have had of the train and succession of ideas in our minds, often make, I will not say uncertain conjectures, but sure and well-grounded predictions, concerning the ideas we shall be affected with, pursuant to a great train of actions, and be enabled to pass a right judgement of what would have appeared to us, in case we were placed in circumstances very different from those we are in at present. Herein consists the knowledge of Nature, which may preserve its use and certainty very consistently with what hath been said. (PHK.59)

This passage is located in the context of responding to an objection from science. Here the point of the interlocutor is that Berkeley’s immaterialism should lead us to deny the well-established truth of science, namely the movement of the earth in space, since he holds that physical things exist just as they are perceived to be: the earth, as long as we are on it, is never perceived to move. However,
Berkeley affirms that we can make ‘sure and well-grounded’ predictions about what we would perceive if we had reached the outer space: there we would perceive the motion of the earth. Thus, even though we have only a limited scope of ‘intuitive knowledge’, we can go beyond the limited scope of knowledge by predictive knowledge of the course of nature which is properly to be classified in the probable knowledge. Should we not say, then, that God ‘has dealt bountifully with the sons of men’ without giving us the ‘intuition’ of all the parts of nature?

But if Berkeley really affirmed this, his position would not be so far from Descartes’. For, this predictive knowledge, however ‘sure and well-grounded’, is after all only morally certain. And he maintains, in the manner reminiscent of Descartes who sought to justify our ‘natural inclination’ by appeal to God’s veracity, that this ‘moral certainty’ is ultimately to be founded, metaphysically, on ‘the goodness and wisdom of that governing spirit whose will constitutes the Laws of Nature’ (PHK.32). Since our way of knowing nature is generally by predictive knowledge, our knowledge of nature, which works in practical contexts, is metaphysically grounded on the attributes of God.

... the operating according to general and stated laws, is so necessary for our guidance in the affairs of life, and letting us into the secret of Nature, that without it, all reach and compass of thought, all human sagacity and design could serve to no manner of purpose: it were even impossible there should be any such faculties or powers in the mind. (PHK.151)

The lawful connections of ‘the course of nature’, which are the object of predictive knowledge, are the effects of God’s will. Berkeley firmly believes that ‘the course of nature’ is, considered in terms of its cause, changeable. Since ‘an omnipotent spirit can indifferently produce every effect by a mere fiat or act of his will’ (PHK.152) and thus all the ‘order and concatenation’ of nature is ‘effects of a free spirit’ (PHK.57), predictive knowledge has no absolutely immutable ground of its truth.
But since, at the same time, this free and omnipotent God is also ‘wise and benevolent’, He always maintains the orderly course of nature in order to display his wisdom and benefit humans, though He has the power to change it. Thus, ‘the course of nature’ can be considered virtually immutable, except the possible case of miracles for which God always reserves the right (PHK.63). Therefore, by virtue of the constancy of God’s will, predictive knowledge can be regarded as ‘sure and well grounded’ for all practical purposes, whether in the context of ordinary life or science. But this way of defending the reliability of our faculty and establishing the legitimacy of our claim of knowing nature, seems quite congenial to Cartesian defence of ‘natural inclination’ and the justification of our belief in the existence of external bodies. And Berkeley’s considered response to scepticism would have been, after all, such Cartesian appeal to ‘moral certainty’. As I see it, however, Berkeley’s official response as discernible in the *Principles* and *Three Dialogues* is predominated by the different motif, that is, it is developed in the spirit of Cartesian intuitionism.

4. Thinking without words: the meditative ideal of the ‘solitary philosopher’

So far in this chapter, we have explored the intuitionist motif in Berkeley’s response to scepticism in his early works. To the sceptical challenge generated by the representationalist dichotomy of real things and ideas, Berkeley’s key move was to unify these two. Therefore, all that is necessary to have knowledge of real physical things is just to perceive the ‘ideas’ present to us by the senses. Since there are no external ‘reality’ by which each idea of sense is to be verified or falsified, presentation and perception of an ‘idea’, in which we have ‘intuition’ of the existence and nature of the object, constitute knowledge of physical reality. As we have seen, this response to scepticism is not satisfactory because the important element of Berkeley’s natural world, ‘the laws of nature’, is kept out of sight. I drew out Berkeley’s possible answer to sceptical challenge if he would have
taken ‘knowledge of laws’ into consideration: operative knowledge, whose object is signs or lawful connections of ideas, has certainty sufficient to work in the practical context (‘moral certainty’), and this certainty is founded, metaphysically, on the wisdom and benevolence of God. But, as I have noted, this answer is not the one he is actually found to offer. In Berkeley’s early thinking, there is a conspicuous tendency to conceive knowledge in terms of perceptual apprehension, i.e. ‘intuition’. In this last section, I will explore how this emphasis on perception in his account of knowledge is associated with another prominent motif in his early philosophy, that is, the thinking without words. Berkeley’s basic attitude to language in the early period is apparently negative. This attitude is, however, changed in his middle period work, Alciphron, and there this change is clearly linked with rejection of his early view that the paradigmatic form of knowledge is ‘intuition’. The study in this section, therefore, will later be connected to the discussion in chapter 4.

The Principles opens with the lengthy Introduction. According to Berkeley’s original plan, it was intended as an introduction to all subsequent parts of this work, Parts 1-3. In Berkeley scholarship, it has been frequently discussed in connection with Berkeley’s anti-abstractionism, according to which we have no such alleged ability to mentally separate one single quality from others which are given to the senses in mixture, or to cut out what is common to several particular qualities and thus produce ‘abstract general’ idea (Pl.7-8). But this anti-abstractionist argument is linked by Berkeley to the broader theme of the Introduction, namely, the misleading nature of language. Berkeley states in section 6 that ‘in order to prepare the mind of the reader for the easier conceiving what follows, it is proper to premise somewhat, by way of introduction, concerning the

74 Although the parts 2 and 3 were never published, Berkeley consistently regarded the Principles as ‘Part I’. The designation ‘Part I’ was removed from the title page in publication of the second edition of the Principles, but it remained in the opening page of the text and at the head of each page. This indicates that Berkeley considered the Principles we now have to represent only one piece of the whole scheme which awaits completion by the following parts. And he never designated ‘Introduction’ as ‘Introduction to Part I’. Thus I take Jessop to be right in his remark in the editor’s introduction that the ‘Introduction is … to the entire scheme’ of the work. Works, II, p.5.
nature and abuse of language'. The 'doctrine of abstraction' is the chief instance of the deception of our understanding brought about by the misuse of language. Berkeley's aim in the *Introduction*, then, is to make us watchful of the trap which the use of language induces us. Now, since this is an introduction to the principles of knowledge, it seems it must have the moral related to knowledge. This point has tended to be neglected by commentators, who have generally considered the arguments in the *Introduction* only in the context of empiricist psychology (focusing on PL.7-10). But I take Berkeley's moral as consisting in this: even though it is not fully realizable, ideally, we should always try to dispense with the use of language in our thinking and knowledge acquisition; once this advice is seriously taken, all those 'innumerable errors and difficulties' derived from the false doctrine of abstraction which has blocked our way to knowledge will vanish; the proper way to knowledge is, after thus having removed abstract ideas, to concentrate on those particular ideas present to the senses and have clear and attentive perception of them.

That the general message of the *Introduction* about the use of language is dominantly negative is manifest in its concluding sections. So the last section begins with these words: 'Unless we take care to clear the first principles of knowledge, from the embarrass and delusion of words, we may make infinite reasonings upon them to no purpose'. This denunciation of 'words' by Berkeley as the chief origin of confusions brought in our knowledge makes a sharp contrast with his appraisal of 'ideas' as the reliable source of knowledge. Thus, in conclusion of the same last section of the *Introduction*, Berkeley recommends his reader to take his words only as 'the occasion of his own thinking, and endeavour to attain the same train of thoughts' as he had, observing: 'I do not see how he can be led into an error by considering his own naked, undisguised ideas'. How great 'advantages' we could derive from such concentration on our 'own naked, undisguised ideas' by removal of words from our thinking, Berkeley depicts in greater details in section 22.
... so long as I confine my thoughts to my own ideas divested of words, I do not see how I can easily be mistaken. The objects I consider, I clearly and adequately know. I cannot be deceived in thinking I have an idea which I have not. ... To discern the agreements or disagreements there are between my ideas, to see what ideas are included in any compound idea, and what not, there is nothing more requisite, than an attentive perception of what passes in my own understanding.

As it is clear from his talking about ‘no-mistake’ and ‘clear and adequate’ knowledge, what Berkeley has in mind here is ‘intuitive knowledge’. The central message of the Introduction is, therefore, that we are in the appropriate position to enjoy ‘intuitive knowledge’ whenever an ‘idea’ is present to us unless the perception of our understanding is disturbed by the use of language. To put this message in other words so that the underlying thought is made explicit, it amounts to say that God had arranged the ideal condition for us to have knowledge by imparting ‘ideas’ to us, until we corrupted this ideal condition by the invention of language. The way to knowledge is, then, to restore the original ideal condition we enjoyed before corruption: ‘It were therefore to be wished that every one would use his utmost endeavours, to obtain a clear view of the ideas he would consider, separating from them all that dress and encumbrance of words which so much contribute to blind the judgment and divide the attention’ (Pl.24). If this endeavour to ‘clear view’ by removal of the barrier of words is made, we will find ourselves confronting the true source of knowledge: ‘we need only draw the curtain of words, to behold the fairest tree of knowledge, whose fruit is excellent, and within the reach of our hand’ (Ibid.).

Thus, as I see it, the Introduction is intended to provide readers with the general methodology of knowledge Berkeley recommends, and it is, quite simply, to turn our attention to the ‘ideas’ given to the senses – they are, of course, all particular ideas for Berkeley – and have ‘a clear view’ of them; in the negative vein, this methodology requires turning our attention from ‘words’ which
covers up the true source of our knowledge, 'ideas', and disturbs our view of them. The practice of this methodology will lead us to 'intuitive knowledge' which is perfect, adequate, and infallible.

Now, Berkeley in his early stage of thinking was fond of proposing curious thought experiments with which he designed to drive home the truth of the theses he would like to establish. Among such thought experiments Berkeley used, the most famous one, which is originally taken from William Molyneux, is that of a man born blind and made to see. This man has both 'sight' and 'touch' but not yet acquired the correlation of them, so that Berkeley expects him to be the best judge about what properties are originally contained in visual ideas. But there is another thought experiment which played no less important role in his early thinking, and he initially planned to use it in the introduction. That is the experiment of the 'solitary philosopher', who is supposed to live without society and have no experience of using language or artificial signs of any sort. The point of using this experiment is, firstly, to break our habitual confusion of 'words' with 'ideas' and make us see that there are no 'abstract ideas' allegedly corresponding to 'general words'; secondly, to illustrate the general methodology of knowledge I formulated above by making a model, in the utopian state of an imagined person, of that original state in which we could enjoy 'perfect knowledge' without any artificial burdens of our own invention – language and the doctrine of abstraction.

This thought experiment of the solitary-philosopher appears in the notebooks and plays a significant role in the Manuscript Introduction, but it was omitted in the published Introduction. In the Manuscript Introduction, Berkeley sets up the thought experiment in the following way.

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75 Luce points out the parallel between the born-blind man experiment and the solitary-philosopher experiment in his note to entry 566 of the Philosophical Commentaries.

76 Bertil Belfrage, George Berkeley's Manuscript Introduction, Doxa, Oxford, 1987. In quotation of the passages from this unpublished introduction, I will use the text as it is presented by Belfrage’s edition, and in reference to them I will follow the paragraph number put by Belfrage.
Let us conceive a Solitary Man, One born and bred in such a place of the World, and in such Circumstances, as he shall never have had Occasion to make use of Universal signs for his Ideas. That Man shall have a constant train of Particular Ideas passing in his Mind. Whatever he sees, hears, imagines, or any wise conceives is on all hands, even by the Patrons of Abstract ideas, granted to be particular. Let us withall suppose him under no Necessity of labouring to secure himself from Hunger and Cold: But at full Ease, naturally of good Facultys and Contemplative. Such a one I should take to be nearer the Discovery of certain Great and Excellent Truths yet unknow[n], than he that has had the Education of the Schools … (MI.48)

We may call this peculiar state of the solitary philosopher the meditative ideal. All that he is supposed to do is to ‘contemplate’ the train of particular ideas as it is presented to his mind one after another, by way of the senses or by the exercise of memory and imagination. His whole effort is solely directed to having clear perception of ideas in contemplation, and this goal is easier for him to achieve than for us thanks to his non-acquaintance with language. Without intervention of ‘Universal signs’ to this utopian state, he will have no occasion to have an illusion that he has ‘abstract ideas’. Such a setting makes good contrast with the circumstance in which philosophers usually are: they are misled by general terms of their own invention and create endless disputes about them. But the concern of solitary philosopher is confined to follow the particular ideas present to him, and the knowledge he has is only about particular ideas. Still, he is in a position ‘nearer the Discovery of certain Great and Excellent Truths’.

It is natural here to ask what moral Berkeley is trying to draw about our cognitive faculty by consideration of the peculiar life of such solitary philosopher. Clearly, the knowledge possessed by this philosopher about his circumstantial physical world is much narrower in scope than that we would desire to possess. In the passage following the above quotation, Berkeley points out:
It is true, the Knowledge of our Solitary Philosopher is not like to be so very wide and extended, it being confin'd to those few Particulars that come within his own observation. But then, if he is like to have less Knowledge, he is withall like to have fewer Mistakes than Other Men. (M 1.48)

Thus, Berkeley acknowledges that the cognitive achievement of the philosopher in solitude is not as extensive as we would desire. The aspect he wants to highlight about this hero is that he would make ‘fewer mistakes’ than we do about the object of knowledge. But the crucial point here is that Berkeley thinks it desirable for us to follow him and narrow down the object of perception to what is actually present without extending its scope beyond the present. The meditative ideal of the solitary philosopher is, of course, impossible for us to actually realize. In setting up the thought experiment in the above, Berkeley expressly states that this philosopher is ‘under no Necessity of labouring to secure himself from Hunger and Cold’. In section 31 of the Principles, as we saw, Berkeley speaks about ‘foresight’, which enables us to ‘know how to act any thing that might procure us the least pleasure, or remove the least pain of sense’. But Berkeley sets up the situation in which there is no use of such ability of ‘foresight’ which is essential for our survival. Nevertheless, it is clear that the solitary philosopher is intended by Berkeley to be an ideal for us. Although it may not be possible to put ourselves in the state of the solitary philosopher, yet he still represents the most preferable, ideal state to make our cognitive faculty perfect.

I have observed that the point of using the thought experiment of the solitary philosopher for Berkeley is, besides exploding the doctrine of abstraction, to illustrate the general methodology of knowledge which he intends to put forward in the Introduction in the imagined person as a model. In Berkeley’s early thinking, this imagined person represents, as it were, the embodiment of our
cognitive idea\textsuperscript{77} in whom our naturally given faculty of ‘understanding’ fully works without impediment, always furnishing us with ‘intuitive knowledge’ of the particular ideas we have (by sense or by imagination), free from mistakes about their existence and nature. But, it may seem, if this is really Berkeley’s cognitive ideal which his methodology of knowledge points to, it is too simplistic: it seems as if the true goal of our cognitive effort consists in nothing more than having ‘clear sight’ of those ‘particular ideas’ which come to present to us. Indeed, according to this solitary-philosopher model, the way to knowledge is the way of \textit{subtraction} rather than construction. The way to knowledge is neither difficult nor complex, for we would immediately have it if only we remove the barrier standing between our perception and its object. This barrier is, as it has been observed, language and the associated illusion of abstract idea begotten by the use of general words. Thus he observes: ‘it is almost incredible what a Mist and a Darkness it [i.e. our annexation of words to ideas] has cast over the Understandings of Men, \textit{otherwise the most rational and Clear-sighted}’ (MI.49; my italics). But once having ‘Remov’d the Veil of Words, I may expect to have a clearer prospect of the Ideas, that remain in my Understanding’ (MI.54). Thus the ‘obstacles being now remov’d I earnestly desire every one would use his utmost Endeavours to attain a clear and naked view of the Ideas He would consider’ (MI.61/cf PI.24). This is, he says, ‘the shortest way to knowledge, and cannot cost too much pains in coming at’ (MI.62).

Therefore, however simplistic it may seem, it is the core thesis of Berkeley’s view of knowledge in the \textit{Introduction} that knowledge consists in clear perception or ‘clear sight’ of particular ideas, and that the proper method to knowledge is to get rid of the barriers disturbing such ‘clear sight’ of the understanding, i.e. language and the illusion of abstract ideas. The solitary philosopher who enjoys perfectly clear perception in meditation, is the ideal model for such view of knowledge. Although Berkeley decided not to use the solitary-philosopher imagery in the

\textsuperscript{77} In his Editor’s Commentary to the \textit{Manuscript Introduction} (p.38), Belfrage suggests a similar point about the significance of the solitary philosopher in Berkeley’s early thinking.
published *Introduction*, there is no reason to take this as an indication of significant change. It may be possible to interpret this omission as due to the too radical implication of this experiment: Berkeley realized that it carries him too far by suggesting the entire abolishment of the use of words in our thinking. But it is remarkable that even in the published *Introduction*, he retains his approval of the advice issued by modern philosophers (whom he accuses of failing to follow it) of ‘laying aside all use of words in their meditations, and contemplating their bare ideas’ (Pl.23). In the published Introduction as well as the manuscript, the warning about the words’ imposition on our ‘understanding’ and their deception is still forcefully maintained and repeated (Pl.21). In both versions of the *Introduction*, the chief goal of our cognitive effort is set in having ‘intuitive knowledge’, and the perfection of the faculty of ‘understanding’ is supposed to consist in having ‘clear sight’ of the particular ideas present to us. The spirit of the ‘solitary philosopher’ is as much alive in the published *Introduction* as in the *Manuscript Introduction*.

However, it may well seem difficult on this account of knowledge to understand how we can possess science, which certainly should be knowledge of certain general truths and extend beyond mere perception of particular ideas. How can the ‘solitary philosopher’ attain scientific knowledge without the use of ‘general words’? He would (as Berkeley gives as the first and second ‘advantages’ following from the practice of thinking without words) never be bothered by verbal disputes, nor would he ‘miserably perplexed and entangled’ by the ‘fine and subtle net of abstract ideas’ (Pl.22), but it is very hard to see how such concentration on ‘particular ideas’ would successfully lead to scientific knowledge. Now in the published *Introduction*, Berkeley explains how scientific knowledge is possible in his system which accommodates only particular ideas.

It is I know a point much insisted on, that all knowledge and demonstration are about universal notions, to which I fully agree: but then it doth not appear to me that those notions are formed by
It is Berkeley's characteristic position in the Introduction that particular ideas are 'rendered universal' by the relation to other particular ideas, i.e. by the relation of signification. We can consider one particular idea as a sign standing for other particular ideas, so by virtue of this function of signification we are led to a certain general truth even though the thing we have before us to perceive is a particular idea. This leaves much to be clarified about the mechanism of 'universal' signification by particular ideas. But the point we are concerned with here is how the use of language, or 'general words', is considered to have a role in acquisition of scientific knowledge. On this point, however, Berkeley does not appear to have anything positive to put forward, except simply stating that the function of general words consists in their being made signs 'signifying indifferently a great number of particular ideas' (Pl.18). His main thrust is again negative, attacking the prevailing assumption that the general terms used in science stand for one precise determinate signification, which assumption he repudiates as unnecessary.

As a conclusion, it would be fair to remark, that Berkeley's discussion in the Introduction has nothing to suggest that he entertained the view that our thinking and the way to knowledge would be impossible without the help of words or language. The only statement about the merit of words concerns their excellent use as the medium of recording the already acquired knowledge: 'words are of excellent use in that by their means all that stock of knowledge which has been purchased by the joint labours of inquisitive men in all ages and nations, may be drawn into the view and made possession of one single person' (Pl.21). On the point about the use of words in acquisition of
knowledge, Berkeley's position in the published Introduction is nothing different from his earlier remark in the manuscript: ‘Words being, so far as I can see, of use only for Recording and Communicating, but not absolutely apprehending, ideas' (Ml.30). In section 19, he observes that ‘many names in use amongst speculative men’ can be ‘for the most part used as letters are in algebra’ in reasoning: we can use and manipulate them without perceiving the ideas signified by them. But it should be noted that this stops short of affirming the essentiality of words in our thinking and reasoning. What Berkeley actually means is: we may substitute ideas by words temporarily in our performance of thought for the purpose of abridgement and efficiency. But this substitution does not add anything new to the contents of our thought we have by contemplation of ideas, and therefore it is in principle dispensable. In other words, reasoning by words without ideas has nothing to add to the thoughts which the solitary philosopher could have.

Characteristic of Berkeley's early philosophy is the view that words are only subsidiary to ideas in our thinking and knowledge acquisition. From such perspective, language is seen as dispensable. It is even to be somehow dispensed with, for it can become impediment to the faculty of ‘understanding’, whose proper function is perception. Substitution of ‘ideas’ by ‘words’ in our thinking is not the way to knowledge but mostly a barrier to it. It corrupts the original ‘clear sight’ of the understanding and never promotes it. Therefore, the proper way to knowledge is thinking without words as is symbolized in the imagined meditative life of the ‘solitary philosopher’. Towards the middle period, however, Berkeley's attitude to language becomes more positive than that we see in the Introduction. According to his view in Alciphron, the ‘solitary philosopher’ who maximally enjoys clear perception of particular ideas is no longer the model of our cognitive perfection. Corresponding to this, the essential role of language, or artificial signs in general, in our thoughts and acquisition of knowledge is reappraised. As we will see in chapter 4, in his discussion

78 The earliest discussion of the algebraic use of words is found in the Manuscript Introduction, on the verso page of folio 20 in which Berkeley develops his second thought on Ml.33.
of scientific knowledge in *Alciphron*, it is explicitly stated that *substitution* of particular ideas by ‘general signs’ is the central feature which characterizes scientific knowledge in general, and that the well-contrived system of artificial symbols is indispensable not only for the direction of our actions but for advancement of scientific theories and the formulation of general rules.
Chapter 3

Knowledge of laws and the language model of nature

In this chapter, I explore Berkeley's thesis of the language of nature in detail and try to clarify his account of knowledge of 'the laws of nature', both at the ordinary and the scientific level, by reference to this thesis.

In section 1, we look at Berkeley's use of the language model in the New Theory. In this work the uniquely Berkeleian conception of nature as 'language' first appears, and the view of knowledge of 'laws' as knowledge of 'the language of nature' is developed through discussion of the specific subject, visual perception of 'space'. This section will introduce my interpretation in section 2 of Berkeley's use of the language model in his account of ordinary knowledge of laws. I begin with a discussion of Margaret Atherton's interpretation of the language model, according to which the principle of habitual association is central to Berkeley's account of knowledge of laws by language analogy. But this interpretation does not capture the whole implication of the language model. I consider a difficulty which arises from the associationist view of laws, i.e. the difficulty about the objectivity of laws, and argue that in order to resolve it Berkeley has to provide another principle which guarantees the correctness of our interpretation of the language of nature.

In section 2, I draw attention to another important aspect of the language of nature, namely, its pragmatic function. A significant point Berkeley highlights about visual language of God is that it gives us 'foresight' for the direction of actions in the pursuit of pleasure and the avoidance of pain. Drawing on this point, I will observe that we can conceive a certain regulating force in the process of learning the language of nature which is analogous to the linguistic training in human society, in which the trainee is regulated by the trainer's approval or disapproval accordingly as the linguistic
behaviour is correct or incorrect. Thus the successful maintenance of the well-being of our body is the *index* to measure our correct mastery of God’s language. I will pursue this point further by reference to Berkeley’s emotive account of language presented in the Introduction to the *Principles*. In the second part of the section, I try to show how Berkeley’s account of the ordinary knowledge of laws in the *Principles* can be interpreted along the thesis of natural language in the *New Theory*. Here I will point out some interesting implications of the language model that have not been well appreciated by commentators: there are different stages in learning the language of nature; and each different stage develops the ability of ‘foresight’ with different degrees of extensiveness. I will conclude this section by clarification of the difference of my interpretation from Atherton’s.

In section 3, I explore Berkeley’s account of the knowledge of laws at the scientific level, which he characterizes as ‘the grammar of nature’. In the first part, I will clarify the implications of his view of scientific knowledge as knowledge ‘by rule’ in contrast to the ordinary knowledge of laws as knowledge ‘by practice’. It will be observed that the distinctive feature of scientific knowledge is that it affords us ‘foresight’ which extends far beyond the immediate circumstance in which we live. This feature is derived from the method of science that it *explicitly* formulates the rules by which the language of nature is composed, studying those rules as such in order to discover the more general rules of that language. Thus, while ordinary knowledge is a habitual adaptation of actions to the immediate circumstances, scientific knowledge is an adaptation of actions to the circumstances of a far greater scale. In the second part, I discuss Berkeley’s critique of Newton’s concept of ‘attraction’ in the *Principles*. There he dismisses the use of ‘hypothesis’ in natural philosophy and reinterprets explanation by ‘attraction’ from the phenomenalistic viewpoint. In the *Principles*, he conceives the nature of scientific explanation in terms of inductive generalization, taking it to consist in the assimilation of phenomena by ‘similitude of appearances’. Thus the ‘general rules’ in scientific explanation is directly derived from phenomenal similitude. This reconstrual of Newton’s
explanation by ‘attraction’, however, is problematic. In section 3 of chapter 4, we will see how his position develops on this point in his middle-period work, _De Motu._

In section 4, I explore Berkeley’s account of ‘knowledge of number’ in the _Principles._ The study of his account of arithmetic is important in that it provides the prototype of ‘knowledge of relations’ by symbolic representation which is developed in the account of scientific knowledge in _Alciphron._ In the first part of this section, I highlight Berkeley’s pragmatic approach to arithmetic. From very early on Berkeley reached the view that the science of arithmetic is concerned with symbolic operations, and he is usually interpreted as supporting a radical nominalist view according to which knowing number just consists in knowing numeral symbols. But I will observe that for Berkeley knowledge of number does not consist in the mere possession of numeral signs but rather in the ability of using signs for calculation of things. In the second part, I try to clarify how Berkeley conceived the nature of number along his pragmatic approach to arithmetic. I critically examine Douglas Jesseph’s interpretation of Berkeley as the earliest advocate of modern formalism. It will be observed that the ‘formalist’ interpretation which identifies the object of arithmetic with signs and the rules of their manipulation is not quite harmonious with Berkeley’s pragmatic approach to arithmetic: his view of arithmetic as essentially practical requires that arithmetical signs have extra-symbolic references. My alternative interpretation is that Berkeley conceives number as consisting in the relations of particular things which are expressed by numeral symbols but are distinct from them. The concept of ‘analogy’ in section 121 is important to this interpretation. I will point out that what Berkeley means by ‘analogy’ is the relational structure of things which is kept constant through expressions of different symbols. Arithmetic can have practical utility in spite of the arbitrary choice of symbols and the variability of denominations by different units, because computations by different symbolic systems, in virtue of expressing the same relational structure of things, can be interpreted as aiming at the same and invariant truth about things.
1. The laws of nature and Berkeley’s ‘language model of nature’

Berkeley maintained the thesis that the whole nature is the language or ‘rational discourse’ of God until his last major work *Siris*. The thesis of divine natural language (I will call it the *language model of nature*) was first developed in the *New Theory of Vision*. As we saw in chapter 1, Berkeley’s concept of nature is ‘functional’. Having eliminated substance and causal power from the inventory of the natural world, he put forward lawful order as the underlying principle of nature. Although the functionalist concept of nature was earlier developed by occasionalists, it is characteristic of Berkeley that he uses the model of ‘language’. The view of nature as the language of God addressed to humans is central to Berkeley’s demonstration of God’s existence and his attributes. This theological implication is fully developed in the fourth dialogue of *Alciphron*. But the same view also plays an essential role in the province of natural philosophy. For Berkeley, learning the lawful orders underlying in the natural world is equivalent to learning the language which is constantly spoken to us by God. Knowledge of ‘the laws of nature’ is conceived by him as knowledge of ‘the language of nature’. Thus relying on some noticeable features of language, he clarifies how it is possible that we know the laws of nature. The significance of the language model for Berkeley’s natural philosophy, then, consists in that it provided him with a scaffold whereby he worked out the structure of knowledge of ‘the laws of nature’.

It has been generally acknowledged by Berkeley scholars that the language model which appears in the *New Theory of Vision* is somehow relevant to Berkeley’s general account of nature.

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2 Luce, in his editor’s introduction to the *New Theory*, observed that ‘the doctrine of divine visual
However, the interconnection between the language model and his account of knowledge of laws has been scarcely made the subject of sustained investigation in the literature. Colin Turbayne explored contemporary significance of Berkeley’s use of the language metaphor for vision by contrast to the Cartesian geometrical model of vision, but his interest was confined to the context of visual theory. The most recent study which extensively discusses the significance of the language model for Berkeley’s general philosophical project is Margaret Atherton’s *Berkeley’s Revolution in Vision*. In the concluding chapter of this excellent study of the *New Theory*, Atherton proposes that we should read Berkeley’s arguments in the *New Theory* and the *Principles* as directed to the same constructive project of accounting for the general validity of our knowledge of nature by the use of the language model. According to Atherton’s interpretation, the chief target of Berkeley in these two works is the Cartesian rationalist view that our senses distort the true nature of physical things as they are in themselves and therefore that they are unreliable means to knowledge of nature: ‘Just as the *New Theory* argued against the claim that vision is not suited to show us the nature of things, language ... is taken over into the *Principles*, and is there quietly extended to the objects of the other senses, and in the form of the divine sensible language it constitutes the golden link between the two books. *Works*, vol.I, p.153. Also Turbayne: ‘If the alternative title for the *Theory of Vision* is Visual Language, then the alternative title for the *Principles* ought to be Phenomenal Language’. Colin M. Turbayne, ‘Berkeley’s Metaphysical Grammar’, in George Berkeley: *A Treatise concerning the Principles of Human Knowledge, with Critical Essays*, (ed.) C.M. Turbayne, Indianapolis: Bobbs-Merrill, 1970.

by rejecting a picture in which the role of vision is to provide a representation of mind-independent spatial properties, so in the *Principles*, Berkeley attacks the notion of mind-independent material objects or material substance directly and concludes that our senses are suited to inform us of "the settled laws of Nature" which constitute our knowledge of the natural world"^4.

In this and the next section, I will try to present a different line of interpretation from Atherton's about the significance of the language model as providing the connection between the *New Theory* and the *Principles*. The point I am going to disagree with Atherton is not that in these works Berkeley intended the language model to serve to establish the reliability of our senses in knowing the true nature of things by rejection of the notion of material substance. Rather, my disagreement is on the point that she characterizes Berkeley's thesis of divine natural language just as a 'theory of sensory representation'^5, evaluating its central import solely in terms of 'habitual' or 'customary' association of sensory ideas. Hence she summarizes Berkeley's account of knowledge of laws:

> In the *New Theory*, we learn about our spatial surroundings when we learn to associate our visual ideas with conceptually unrelated and nonresembling ideas of touch. So in the *Principles* and *Three Dialogues*, learning more about the nature of things is a matter of expanding the associations among our ideas. What we are learning about are those generalizations we call the laws of nature"^6.

Thus, in Atherton's view, it was this *associationist* view of knowledge of the laws of nature that Berkeley opted for in opposition to the representationalist, essentialist view of knowledge of nature.

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^5 Ibid., pp.232-3: "The *Principles*, like the *New Theory*, can be seen as primarily concerned with the nature of what is represented by sensible qualities. ... Immaterialism, the thesis Berkeley contrasts with materialism, is ... a theory about what ideas represent. Considered negatively, it rejects the concept of material substance as useless and incoherent; considered positively, it claims that ideas represent only other ideas ... that natural knowledge is a matter of learning to read the universal language of nature".

^6 Ibid., p.242.
supported by rival philosophers. Now, as an interpretation of the New Theory, it is undoubtedly appropriate to consider the language model to be providing a ‘theory of sensory representation’ by the principle of association between perceivable ideas. However, when it comes to the question about what role the language model plays in the New Theory and in the Principles in his account of the laws of nature (to which Atherton addresses herself in the concluding chapter of her book), I think this interpretation is inadequate. Associationism is certainly one important aspect of the language model of nature, but it does not capture the whole implication of it.

The core insight which underlies Berkeley’s use of the language model, in my view, is the conception of knowledge of the laws of nature not merely in terms of mere association of ideas but rather in terms of prediction of future experience, or, as he put it, ‘foresight’. As I will argue in this and the next section, this interpretation not only gives a better explanation of how Berkeley intended the language model of the New Theory to serve for his account of knowledge of laws in the Principles. It also points to the way out of the difficulty which the language model would have faced if it only consisted in the associationist principle. Berkeley characterizes ‘the language of nature’ as ‘universal’, putting emphasis on its common and objective usage all over the world. But his denial of ‘necessary connection’ between sensible ideas and his insistence on their association by contingent coexistence fail to explain how our knowledge of the lawful connection of ideas can have universal validity or objectivity. This difficulty can be resolved by taking into consideration the predictive function of the language of nature which is vital to the maintenance of the well-being of our body and life. Furthermore, another point of interpreting Berkeley’s language model in terms of ‘foresight’ is that this interpretation makes clearer the Cartesian (or Malebranchean) background of Berkeley’s account of ‘knowledge of the laws of nature’. On this point, too, my interpretation differs from Atherton’s which emphasizes Berkeley’s rivalry with Descartes and Malebranche. I will return to the comparison of my position with Atherton’s in the conclusion of section 2.
We will begin with a brief review of how Berkeley analysed the nature of visual perception in the *New Theory*. The central task of the *New Theory* is to explain how we perceive by sight such spatial properties as ‘distance, magnitude, and situation’. In the beginning, he reminds the reader that optic writers generally agree that space is *not immediately* perceptible by sight: ‘It is, I think, agreed by all that distance, of itself and immediately, cannot be seen’ (NTV.2). Accordingly, Berkeley develops his account of vision on the premise that ‘there are two sorts of objects apprehended by the eye, the one primarily and immediately, the other secondarily and by intervention of the former’ (NTV.50). The objects immediately perceived by sight is restricted, according to Berkeley, to modifications of ‘light and colours’ such as various degrees of clearness, distinctness, and faintness of appearance (or sensations in the eyes accompanying convergence and accommodation) which are not intrinsically spatial. The spatial world, in his view, is properly perceived by touch, and this tactual space is perceived by sight only by means of modifications of light and colours. Thus characterizing visual perception of space as non-immediate, the chief concern of Berkeley is to identify the general principle by which this mediate seeing of space is made possible. The principle he invokes is that of *customary connection* between visual and tactual ideas, and by reference to this principle he compares the visual world to ‘language’.

Berkeley’s main points of emphasis in drawing analogy between vision and language are: *first*, there is no ‘necessary connection’ between visual ideas (*signs*) and tactual ideas of distance, size, and situation (*significates*), but it is only regularity as a matter of fact (i.e. repeated coexistence) that underlies their connection; *second*, as a consequence of this, there is no *a priori* rational principle that the mind can rely on to work out the *significates* from *signs* – it is only experience that carries

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7 The view that the objects we immediately see are only ‘light and colours’ is repeatedly expressed by Berkeley throughout the *New Theory* (NTV.103/130/156). But at the same time, it is also true that he does not strictly adhere to this view, because he occasionally speaks of ‘visible extension’, ‘visible magnitude’, ‘visible figure’. In the *Theory of Vision Vindicated*, he states that the ‘proper and immediate object of vision’ contains ‘bounds or limits’, ‘order and situation’ (TVV.44).
the mind from the one to the other, as is the case in understanding the meaning of words. Berkeley tries to establish these points through detailed analyses of how we see distance, size, and situation, and the statement of the thesis of the language of nature comes at the concluding section.

Upon the whole, I think we may fairly conclude that the proper objects of vision constitute the universal language of nature ... And the manner wherein they signify and mark unto us the objects which are at a distance is the same with that of languages and signs of human appointment, which do not suggest the things signified by any likeness or identity of nature, but only by an habitual connexion that experience has made us to observe between them. (NTV.147) 

The view of visual space as having a language-like structure is opposed to two rival views Berkeley repudiates as false. One is the vulgar view that in visual perception space is directly present to us and is perceived immediately by itself. In rejection of this vulgar view he stands on the side of philosophers. The other is the accepted philosophical view (advocated by Cartesians) that space is geometrical extension which exists independently of the mind; this objective, geometrically structured space is supposed to be perceived only mediately by means of certain geometrical apparatus ('lines and angles') which are built-in to our visual system.

Berkeley's position, in contrast to these mistaken views, is formulated as follows. Visual space is not a direct presentation to us but rather a re-presentation of tactual space (against the vulgar). But the representational structure of visual space should be conceived as analogous to that of language (against philosophers who conceive it as geometrical). Visual ideas signify tactual space and suggest it to the mind by the principle of association established through experience, just as words

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8 This is from the first/second edition of the *New Theory* (1709). In the third/fourth edition (1732), annexed to the first/second edition of *Alciphron*, the first sentence of the above quoted passage reads 'the proper objects of vision constitutes a universal language of the Author of nature'.
signify their meaning and suggest it to the mind by the conventional rules we learn through experience. Berkeley characterizes this mental function of ‘suggestion’ as imaginative rather than intellectual. Although in the New Theory Berkeley frequently uses ‘judgement’, ‘inference’, or ‘estimation’ as equivalent to ‘suggestion’, he consistently emphasizes that this quasi-judgemental function does not work by certain rational principles. This is the central point of Berkeley in opposition to the ‘received’ view of philosophers: ‘What seems to have misled the writers of optics … is that they imagine men judge of distance as they do of a conclusion in mathematics’ (NTV.24). Thus, ‘suggestion’ as Berkeley conceives it is association, which is the simple habitual response of the mind which reproduces the connections experienced in the past, and he attributes this association to the working of imagination (TVV.9-10).

Thus summing up Berkeley’s language model along the standard reading of the New Theory, let us now consider a problem which arises from his view of visual space as linguistically structured. The point of the language model is to reject ‘necessary connection’ as the explanatory principle and replace it with a ‘customary connection’ which is nothing more than an empirical association of ideas. But it would seem that the language model which rests solely on this associationist principle has a difficulty in accounting for the objectivity of our experience of visual space.

Throughout the New Theory, Berkeley is particularly concerned to put emphasis on the purely contingent nature of the connection between visual language and tactual ideas of space. He consistently maintains that the same visual idea is ‘equally fitted’ to signify any degree of distance or size, observing that this is ‘just as the words of any language are in their own nature indifferent to signify this or that thing or nothing at all’ (NTV.26/64). In the later sections, Berkeley pushes this point to the extreme, insisting on the complete ‘heterogeneity’ between ideas of sight and touch: ‘I shall venture to lay down the following proposition: The extension, figures, and motions, perceived by sight are specifically distinct from the ideas of touch called by the same names, nor is there any
such thing as one idea or kind of idea common to both senses’ (NTV.127). According to Berkeley, therefore, it is mere factual ‘co-existence’ or coincidence that underlies the customary association between visual idea of ‘light and colours’ on the one hand and tactual idea of space on the other:

That one idea may suggest another to the mind, it will suffice that they have been observed to go together, without any demonstration of the necessity of their coexistence, or without so much as knowing what it is that makes them so to coexist. (NTV.25)

But insistence on the purely arbitrary connection of visual and tactual ideas renders it difficult to understand how the language of vision can have the general or public use for which it is designed by God. As we saw in the previous quotation from section 147, visual language is characterised by Berkeley as ‘the universal language of nature’. Visual language of divine institution, even though it is no less ‘arbitrary’ than the languages of human institution, is said to have much wider public use in the world than any one of the languages of man, which are so many and diversified:

... whereas the latter [= the languages of man] is variable and uncertain, depending altogether on the

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9 It seems likely that this account of ‘suggestion’, and with it the language model, is originally derived from Malebranche. The summary statement of this section in the table of content (given by Berkeley) says: ‘The Cause, why one idea may suggest another’. Now it was Malebranche who, in discussion of ‘the connection between the ideas and the traces’ by which imagination works, distinguished three causes of it: 1. ‘nature, or the constant and immutable will of the creator’, 2. ‘the identity of the times’, 3. ‘the will of men’. According to Malebranche, these three causes form a hierarchical order: the second presupposes the first, and the third presupposes the first two. And suggestively, he uses the example of ‘language’ to illustrate associations formed by the experience of mere temporal coincidence, and observes that the association between ideas and traces that constitutes human language is regulated and stabilized by ‘the will of men’ and made useful for society. Search, Book 2, part 1, chapter 5 (L.O.102). Although Malebranche’s concern here is to apply his theory of imagination to the formation of language in human society (which is ultimately founded on ‘nature’ or the will of God), Berkeley may have taken hints from this discussion and applied it to develop his account of vision by the language model. Luce briefly mentions the origin of Berkeley’s language model by reference to Malebranche, Berkeley and Malebranche, p.43.
arbitrary appointment of men, the former [= the language of nature] is fixed and immutably the same in all times and places. A visible square, for instance, suggests to the mind the same tangible figure in Europe that it doth in America. Hence it is that the voice of the Author of nature, which speaks to our eyes, is not liable to that misinterpretation and ambiguity, that languages of human contrivance are unavoidably subject to. (NTV.152)

But if visual and tactual ideas have no necessary connection or intrinsic likeness and are combined together only accidentally by experience of their coexistence, how is it the case that the signification of visual language be ‘fixed and immutably the same in all times and places’, without liability to ‘misinterpretation and ambiguity’? How can it be ascertained that we all have successfully learned the same visual language of God’s appointment?

The associationist principle by itself gives us no safeguard to keep us from mistaking about the intended meaning of God’s language. Berkeley observed in section 25 that habitual association and ‘suggestion’ from one idea to another can occur on the basis of mere concomitance of ideas. But this would equally legitimatize the visual-tactual associations which people generally tend to acquire and the idiosyncratic ones which some people acquire in an uncommon circumstance. Suppose, for instance, a man who has been long accustomed to see the full moon with a small cube in each of his hands; he would acquire, by the principle of habitual association, the mental habit by which tactual ideas of two small cubes are immediately ‘suggested’ whenever he has a visual idea of a round yellow disc in the sky. We may naturally judge that his interpretation of the meaning of visual language went wrong. But Berkeley’s associationist principle has nothing in it to differentiate such an idiosyncratic correlation of visual and tactual ideas from the ‘correct’ correlation of them. Accordingly, God’s visual language seems ‘ambiguous’: we are always uncertain about the true meaning of God’s speech but have no reliable way to decide it.
Seeing the tension between associationism and the thesis of ‘universal language’, it is tempting to say that Berkeley presupposed what he wanted to explain: while he appears to be trying to explain the visual-tactual correspondence by the principle of ‘customary connection’, he in fact assumed throughout his discussion that the connection between visual ideas of light and colours with tactual ideas of space is established \textit{a priori} before learning it through experience. Berkeley never realizes the gap between the claim about the \textit{contingency} of the connection on the one hand and the claim about \textit{the necessity of learning} it on the other. Clearly, the point that visual-tactual connection is not necessary or intrinsic does not entail that their connection must be learned through experience. For, however contingent the visual-tactual connection might be, it may be the case that we are born with the visual system which has the connection already built-in. In the \textit{New Theory}, Berkeley is wholly occupied with establishing the \textit{arbitrariness of the visual-tactual connection}, but he never argues for the necessity of \textit{empirical learning}; he seems just assuming that the former thesis entails the latter. But his neglect of the gap may be taken as indicating Berkeley’s unconscious assumption that we already know which visual idea is to be associated with which tactual spatial property before we actually combine them through experience. Because of his failure to clearly distinguish his own position from the innatist view, he unconsciously introduced innatist view into his associationist account of vision. This is why he could exempt himself from the task of explaining how we can successfully associate visual signs with their tactual meaning as God intended it in spite of the ‘arbitrary connection’ between them.

However, we can opt for a more charitable line of interpretation. The interpretation of Berkeley’s language model I am going to propose below can answer to the question about the objectivity or publicity of the language of nature without attributing to Berkeley a gross mistake we have just described. This interpretation regards the concept of ‘foresight’, rather than customary connection, as central to Berkeley’s language model both in the \textit{New Theory} and in the \textit{Principles},

139
and combines ‘foresight’ with the mind’s disposition towards pleasure (or aversion from pain). Thus, the intended meaning of God’s ‘universal language’ are various sensible pleasures to be attained (or pains to be avoided), and we can successfully learn this language, without danger of mistaking its meanings, by virtue of our inclination towards pleasure. In the next section, we will first see how this proposed interpretation applies to the New Theory, and then afterwards proceed to see the development of the same idea in the Principles.

2. ‘Foresight’: the language model and the pragmatic approach to knowledge of laws

(1) The language model in the New Theory

As we saw in the preceding section, Berkeley concluded in section 147 of the New Theory that ‘the proper objects of vision constitute the universal language of nature’. But I have not yet quoted the first half of the same section, where he remarks that by this language,

… we are instructed how to regulate our actions, in order to attain those things that are necessary to the preservation and well-being of our bodies, as also to avoid whatever may be hurtful and destructive of them. It is by their information that we are principally guided in all the transactions and concerns of life.

This remark on the pragmatic function of divine visual language gives us a new starting point for exploration of the deeper implications of Berkeley’s language model. As it has been made clear in the foregoing discussion, there is nothing in the associationist principle that determines the ‘correct’ interpretation of visual language. It is commonly observed that language is ‘arbitrary’, and Berkeley frequently repeats it in the New Theory. But in spite of such arbitrariness, we successfully learn the same language in the linguistic community to which we belong. No doubt it is because
certain controlling forces are working in the process of learning language by which the connection between words and meaning is made more than mere accidental association.

In the process of learning a language of human invention, certain authoritative persons who represent the linguistic community constantly supervise the learner so that s/he will be corrected whenever s/he makes mistakes. Moreover, the learner will be naturally willing to behave in conformity to their supervision for the interest of survival in the linguistic community. Turning to the language of divine invention, are there analogous forces working in the process of learning it? The above passage suggests that there are: we learn visual language for 'the preservation and well-being of our bodies'. In the linguistic community of divine administration, 'correct' interpretation of the language enables us to successfully accomplish this end, whereas misinterpretation results in our destruction. But it may seem that the analogy with learning language in human community does not apply to the process of learning the language of God because there is no trainer present in the latter. How are we informed that we took the meaning of divine visual language correctly? Is there such conversational relationship in learning the language of God as we find in human linguistic training, in which the trainee is responded by the trainer with an approval or disapproval accordingly as s/he behaves correctly or incorrectly?

We can see how conversational relationship is involved between God and men in the process of learning divine visual language by taking into account Berkeley's remark that the faculty of vision is given to us for regulation of actions by prospect of beneficial or harmful experiences in the future. In a remarkable passage in the New Theory, Berkeley observes:

... for this end the visive sense seems to have been bestowed on animals, to wit, that by the perception of visible ideas (which in themselves are not capable of affecting, or any wise altering the frame of their bodies) they may be able to foresee (from the experience they have had, what tangible ideas are
connected with such and such visible ideas) the damage or benefit which is like to ensue, upon the application of their own bodies to this or that body which is at a distance. Which foresight, how necessary it is to the preservation of an animal, every one's experience can inform him. (NTV.59)

The key concept of this passage is 'foresight'. For Berkeley, seeing is fore-seeing (or 'prognostics', as he put it in section 44 of the Principles). Seeing things at a distance (i.e. seeing visual signs which signify tactual ideas of things at a distance) essentially involves expectation of what will happen to our bodies when we come in contact with those things at a distance. And it is particularly important to note that the future tactual experience which we expect by 'foresight' is 'damage or benefit' resulting from our actions. Thus in the same section as quoted above, Berkeley observes:

We regard the objects that environ us in proportion as they are adapted to benefit or injure our own bodies, and thereby produce in our minds the sensations of pleasure or pain. ... bodies operat[e] on our organs, by an immediate application, and the hurt or advantage arising there-from, depend[s] altogether on the tangible, and not at all on the visible, qualities of any object.

The primary function of visual language, therefore, is to confer us with the ability of foreseeing those benefits and damages, 'sensations of pleasure or pain', which will arise through immediate contact with things located at a distance.

Now we can identify something analogous to the supervisor's approval and disapproval in this conception of visual language. Since the end of visual language is to confer us with the ability of foreseeing future tactual experience, and since this tactual experience involves benefit to the body (pleasure) or damage to it (pain), learning to see is learning how to conduct our actions through visual signs in order to have pleasure and avoid pain. Thus, learning visual language is not just
acquiring habitual association of ideas by which certain tactual ideas are ‘suggested’ to the mind by virtue of the past experience of their connection with certain visual ideas. Rather, it is essential for mastery of this visual language that we can successfully regulate and adjust our actions by prospect of pleasure or pain which will result from our actions. My point, then, is that pleasurable experience which we attain in accordance with our interpretation of visual language is analogous to the approval of the trainer in linguistic education. Perceiving a certain visual sign, e.g. a round, red-coloured figure in distinct appearance and with strained feeling of the eyes (these are signs of near distance in Berkeley’s account of vision), we interpret it as signifying a tangible apple located at the arm’s length, and we ‘foresee’ that if we stretch out our hand and eat it, we will have pleasurable sweet taste. We are confirmed by God that this interpretation is correct if we have pleasurable experience as expected. Thus, if God’s visual language signifies something beneficial, correct interpretation will be rewarded with pleasure and incorrect interpretation will result in missing pleasure. Similarly, if visual language signifies something harmful, correct interpretation will exempt us from pains but incorrect interpretation will result in suffering.

Berkeley’s observation about the pragmatic function of visual language, therefore, provides us with a key to understanding how this language can be universal. God’s intention in addressing visual language to us is to enable us to regulate actions with ‘foresight’ of pleasure or pain which would arise through direct contact with tangible things at a distance, and our mastery of this language is measured by general success in attaining pleasure and avoiding pain. As we have seen, the associationist principle does not explain why we can learn the same language of God in all times and places. If we learned visual language only by habitual association which would connect any visual sign with any tangible things we encounter in the given circumstance, whatever ideas of touch would pass as proper meanings of visual signs. But since there are pragmatic constraints involved in the process of learning visual language, habitual association of visual signs with tactual
meanings cannot be just arbitrary. If we learned to interpret distinct, larger visual appearance as signifying far distance, and faint, smaller appearance as signifying near distance, we could not be successful in the everyday business of getting foods and avoiding dangers. Thus successful maintenance of the bodily well-being is the index or criterion of correct interpretation of God's visual language. Since we constantly endeavour to preserve our own well-being, we cannot but interpret visual language so that it may always give us directions about how to act in order to attain this end. Our desire for survival naturally urges us to attach the same meaning to visual signs in whatever times and places we might grow up.

Now at this point it seems natural to connect this observation about the pragmatic function of divine visual language with Berkeley's remark on the 'end of language' made in the *Introduction* to the *Principles*. In section 20 of the *Introduction*, Berkeley calls attention to the pragmatic function of language, by way of criticizing the commonly held view about the use of language.

... the communicating of ideas marked by words is not the chief and only end of language, as is commonly supposed. There are other ends, as the raising of some passion, the exciting to, or deterring from an action, the putting the mind in some particular disposition; to which the former is in many cases barely subservient, and sometimes entirely omitted, when these can be obtained without it, as I think doth not infrequently happen in the familiar use of language.

The view of language which is attacked here is ascribable to Locke. According to Locke, the proper use of language consists in communication of ideas: words should be used only to be informative, i.e. to suggest ideas of the speaker to the hearer. The use of words without communication of ideas is meaningless and hence should be regarded as an abuse of language. For Locke, the proper and meaningful use of words must involve perception of ideas both in the speaker and the hearer. In
opposition to this Lockean view, Berkeley observes that there are cases in which the informative function of language is only ‘subservient’: we may use language for the emotive purpose. Now I postpone discussion on Berkeley’s general account of the use of language until next chapter 4. Here I concentrate on the implication of the above remark for his view of visual language.

Berkeley observes about the languages of man that communication of ideas is not ‘the chief and only end’ of language, pointing to ‘other ends’: they may be used for the emotive purpose rather than for the informative purpose. It is natural, then, to take him as considering (since Introduction was written concurrently with, or immediately after the completion of, the New Theory) the same observation to be applicable to the language of God as well. Thus, he can be taken as thinking that

the communicating of ideas [i.e. tactual ideas of space] marked by words [= visual ideas] is not the chief and only end of God’s use of visual language. There are other ends, as the raising of some passion, the exciting to, or deterring from an action, the putting the mind in some particular disposition ...

Of course, it would go too far if we take Berkeley as accepting the view that divine visual language functions properly without communication of ideas. The main objective of the New Theory was to explain how we perceive distance, size, and situation by sight, and Berkeley’s explanation was that we see spatial properties because tactual ideas of space are ‘suggested to the mind’ by visual ideas.

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10 It should be noted that my use of the term ‘emotive use’ is here intended particularly to highlight the action-motivating function of language rather than the passion-raising function. In section 20 of the Introduction the examples Berkeley actually gives are the uses of words for the purpose of raising ‘the passions of fear, love, hatred’. But in clarification of the connection between his thesis of the language of nature and the emotive account of language, it will be more useful and instructive to focus on the action-motivating function of the language of nature. Perhaps, however, it may be possible to interpret their connection by taking account of the passion-raising function of natural language (as it is indicated in section 1 of the Principles: ‘as [sensible ideas] are pleasing or disagreeable, [they] excite the passions of love, hatred, joy, grief, and so forth’).
just as meanings are by words. Visual language is addressed by God to humans in order to ‘communicate’ tactual ideas (spatial meaning) by visual ideas (words). This being granted, however, it still is the case that for Berkeley the communicating of tactual ideas is not ‘the chief and only end’ of divine visual language. The chief end for which God exhibits visual language to us, as we can gather from the previously quoted passage in section 147, is to instruct us ‘how to regulate our actions’ for the well-being of life. Although it is necessary for visual language to serve this end that it suggests tactual ideas to the mind (since it is tactual ideas that directly affects our body and thereby produces pleasure or pain), perception of tactual ideas (which is ‘suggested to imagination’) is ‘subservient’ to some other, ultimate end of visual language. The ultimate end of visual language is ‘the exciting to, or deterring from an action’. The primary end of visual language as is intended by God is influencing our actions; the informative aspect of this language, i.e. perception of ideas, is secondary and subordinate to this end.

Although the connection between Berkeley’s remark on the action-influencing use of language and his thesis of visual language has not attracted commentator’s attention, it is, in my view, of great importance for understanding his account of knowledge of nature. It has been generally recognized that the language model is relevant to Berkeley’s account of knowledge of nature. But as far as I know, commentators have not tried to interpret Berkeley’s language model of nature by reference to his general view of language. But if we consider the interesting interconnection between the language model of nature and general theory of language in Berkeley and integrate his observation about the action-influencing use of language into the thesis of divine natural language, we will have a new prospect about his account of knowledge of nature. The new prospect which emerges is that knowledge of nature is now defined in terms of the ability of action rather than perception. For Berkeley, we know ‘the laws of nature’ by learning ‘the language of nature’ God speaks to us. But if God’s intention of using this language is to excite us to or deter us from actions,
we will be said to understand it when we learn to act in the way the speaker, God, expects us to do.

Knowledge of the laws of nature, then, consists in the ability to act in accordance with God’s intention of speaking to us in a given situation. God, being benevolent, always intends to promote the ‘well-being of our bodies’, instructing us how to act for the attainment of pleasure and avoidance of pain in a specific circumstance in which our body is located.

(2) The language model in the *Principles*

I have discussed so far the significance of the pragmatic function of ‘the language of nature’ with regard to his theory of vision. The same point applies to Berkeley’s general account of knowledge of the laws of nature in the *Principles*. As we will see, his account in the *Principles* reveals several interesting thoughts underlying in his conception of ‘the language of nature’. The underlying thoughts I explore in Berkeley’s account of knowledge of the laws of nature in the *Principles* are: that there are distinguishable stages to go through in learning the language of nature; that each different stage of our knowledge of nature correspond to the ability of ‘foresight’ which is developed with different degrees of extensiveness. These are the points that have been missed in the treatment of Berkeley’s language model in the literature, and discussion below of these points will show how Berkeley’s language model is actually more complex than the standard interpretation supposes. As I have noted before, it is generally recognized by commentators that the thesis of divine natural language forms common underlying theme of the *New Theory* and the *Principles*. But they tended to conceive the linkage between the *New Theory* and the *Principles* only in general terms, as in Luce’s observation that the language model which was applied specifically to the objects of sight and touch in the *New Theory* was ‘extended’ in the *Principles* to all sense modalities in his general account of knowledge of nature. But we may use the following picture as a starting point.
Berkeley’s concern in the *New Theory* is the problem about ‘space’ (considered as the object of vision). In the *Principles*, his chief concern is the problem about ‘causality’ (considered as the object of the *senses*). In the *New Theory*, Berkeley attacked the vulgar view that we directly perceive space and the philosophers' view that we perceive visual space by geometrical reasoning trading on *necessary connections*, by means of ‘lines and angles’. His view in opposition to these was that we perceive visual space by customary association established through experience between visual ideas of light and colours and tactual ideas of space, in just the same way as we understand the meaning of words. In the *Principles*, Berkeley attacks the view commonly held by the vulgar and philosophers, that we know natural causality by observation of *necessary connection* between physical things. The ‘necessity’ here relevant is not geometrical but *metaphysical*, that is, the necessity which is derived from *causal power* or efficacy. The vulgar supposes that production of natural effects by causal power is evident at the level of ordinary sensory experience (PHK.32). Philosophers, on the other hand, suppose that the production of effects by efficient causality is discoverable only at the invisible micro-level where the true mechanism of sensible qualities and behaviours of bodies lies (PHK.102). Berkeley rejects both of these views as wrong. His alternative view is that knowledge of natural causality consists only in the sign-signified connections of ideas.

... the connexion of ideas does not imply the relation of *cause* and *effect*, but only of a *mark* or *sign* with the thing *signified*. The fire which I see is not the cause of the pain I suffer upon my approaching it, but the mark that forewarns me of it. In like manner, the noise that I hear is not the effect of this or that motion or collision of the ambient bodies, but the sign thereof.

There is no necessary connection or efficacy underlying the connection of natural phenomena, all physical things being ‘ideas’ which are inefficacious. Thus, whether at the ordinary visible level or
at the invisible micro-mechanical level, natural causality is to be conceived on the model of conventional language: all those relations that are generally taken as 'causal' are regularities by custom, and we learn them through repeated experience of the co-incidence of sensible ideas just in the manner we learn language through experience of the connection of words with meanings. Hence philosophers who aim at explaining natural phenomena by identification of true efficient causes are totally misguided: 'it is the searching after, and endeavouring to understand this language (if I may so call it) of the Author of Nature, that ought to be the employment of the natural philosopher, and not the pretending to explain things by corporeal causes' (PHK.66; first ed.).

Now from this general description of the linkage between the *New Theory* and the *Principles* we shall get further into Berkeley's account of our knowledge of the laws of nature. In discussion of Berkeley's theory of vision, I highlighted the pragmatic function of visual language that it enables us to regulate actions for the well-being of life. For Berkeley, seeing is the 'foreseeing' of future tactual experience, and visual language God speaks to us foretells how many distances we should move before coming in contact with tangible things, and thereby facilitates us to attain benefits and avoid damages for the interest of our body. Turning to the *Principles*, we find a remark to the same effect in the passage where Berkeley mentions 'the laws of nature' for the first time.

... the set rules or established methods, wherein the mind we depend on excites in us the ideas of sense, are called the *Laws of Nature*: and these we learn by experience, which teaches us that such and such ideas are attended with such and such other ideas, in the ordinary course of things. This gives us a sort of foresight, which enables us to regulate our actions for the benefit of life. And without this we should be eternally at a loss: we could not know how to act any thing that might procure us the least pleasure, or remove the least pain of sense. (PHK.30-1)
Here we can clearly see Berkeley’s empiricist account of knowledge of laws is closely tied with the pragmatic view of knowledge. As we saw in section 65, the relations of natural phenomena we know through experience are not those of cause and effect but of sign and the signified. But the central import of this replacement of causality with semiotic relations lies in that knowledge of nature is conceived primarily in terms of pragmatic significance. For Berkeley, our knowledge of the laws of nature is analogous to understanding language not simply because it depends on empirical association but because it involves the acquisition of the ability to ‘regulate our actions’ in accordance with the directions of sensible signs. Thus we should see the common underlying theme of the New Theory and the Principles in the language model construed on the pragmatic view of knowledge. Berkeley’s account of knowledge of nature, as it is developed on the language model in the New Theory and the Principles, conceives knowledge of laws (knowledge of space and causality) as the ability of action and not simply as the ability of perception.

In order to appreciate this point more fully, let us further examine the implication of what Berkeley has to say in section 32. In the above passage, Berkeley characterizes knowledge of the laws of nature as the ability of ‘foresight’ by which we act in order to ‘procure us the least pleasure, or remove the least pain of sense’. In the next sentence, he gives examples of such ‘foresight’:

That food nourishes, sleep refreshes, and fire warms us; that to sow in the seed-time is the way to reap in the harvest, and, in general, that to obtain such or such ends, such or such means are conducive, all this we know, not by discovering any necessary connexion between our ideas, but only by the observation of the settled laws of Nature …

These are clearly examples of what we consider as knowledge of natural causality, and Berkeley insists that this knowledge does not consist in discovery of ‘necessary connection’. As we saw in
section 65, what we ordinarily take as relations of cause and effect are actually the sign-signified relations by which we are instructed how to act. In Berkeley's analysis, then, knowledge of natural causality does not involve understanding that food makes us nourished, sleep makes us refreshed, and fire makes us warm, but only that 'if we take food we will be nourished', 'if we sleep we will be refreshed', and 'if we approach fire we will be warm'. In these examples of knowing natural causality, what we know is not the relationship between things or qualities which holds by virtue of causal power (contrary to the vulgar belief and ordinary expressions), but in truth it is the relationship between ends and necessary means, in which the ends are various species of pleasure and the means are certain actions which are conducive to the intended pleasure. To know nature is to have the ability of regulating actions with 'foresight' in the given circumstance, rightly arranging the means in order to have a desired pleasure and keep away from pains

Now I have to get into the point which I have hitherto left ambiguous. In putting emphasis on Berkeley's pragmatic approach in his account of knowledge of laws, I do not mean to suggest that...

11 There is an interesting possibility of interpreting Berkeley's language model of nature as outlined in the above with his doctrine of the innate disposition towards pleasure which is developed in the Guardian Essay no.49, entitled 'Pleasure'. In this essay, Berkeley observed: 'we are prompted to natural pleasures by an instinct impressed on our minds by the Author of our nature, who best understands our frames, and consequently best knows what those pleasures are, which will give us the least uneasiness in the pursuit, and the greatest satisfaction in the enjoyment of them' (Works, VII, p.193). This existence of certain original mental dispositions or tendencies was consistently maintained until the later period in the Sermon entitled 'On the Will of God' delivered in 1751. And what is particularly interesting about Berkeley's innatism, of which we can take hints from this sermon, is the view that our innate mental disposition needs to be trained through interaction with external circumstances to be fully unfolded. Berkeley does not mean to confine innate mental disposition to instincts in the sense of the fixed, built-in responses to the circumstances. Rather, he thinks that the mind should be 'at proper periods, in certain circumstances' in order for its original dispositions and tendencies to manifest themselves (Works, VII, p.130). Now if we consider that for Berkeley the external natural circumstances constitute 'the language of nature', his doctrine of innate mental disposition looks even more interesting. We have an original disposition towards pleasure which is implanted in us by 'the Author of our nature', but this natural disposition is waiting to be properly developed through learning 'the language of the Author of nature'. The external nature, which God exhibits to us in the form of 'language', should play an indispensable role for the development of our internal nature, the originally implanted disposition of our mind.
he conceives of knowledge of laws only in terms of the ability of acting to the exclusion of understanding. While Berkeley denies that our knowledge of laws involves the understanding of causal relations, he clearly affirms that it involves the understanding of the relations of means for ends. Knowledge of the laws of nature, therefore, is the ability of acting deliberately, not blindly. Otherwise, we would not be able to ‘sow in the seed-time’ in order to ‘reap in the harvest’. But ‘foresight’, as the ability of deliberative action, may be developed and exercised with different degrees of sophistication. Berkeley’s examples in section 32 provide us with interesting hints about this point. The first two examples of food-nourishment and sleep-refreshment are the exercise of ‘foresight’ in the most primitive form of understanding. Eating and sleeping are instinctive actions (though Berkeley in this section seems to think of them as empirically acquired) whereby we have immediate satisfaction. The next example of having fire and getting warm gives an example of more sophisticated ‘foresight’ which involves judgements about the means-end connection based on deliberation and experience – other animals never acquire such foresight. The last example of ‘sowing in the seed-time’ involves the highly developed understanding by deliberation on a long series of the means-end connections which ultimately lead us to distant pleasures: it requires a far greater extensiveness of ‘foresight’ than eating or sleeping.

I shall conclude this section by clarification of the difference of my interpretation of Berkeley’s use of the language model from Margaret Atherton’s, which I have reviewed in section 1.

In the beginning of this chapter, I quoted Margaret Atherton’s interpretation of Berkeley on knowledge of the laws of nature. According to Atherton, the New Theory and the Principles together can be seen as aiming at the same positive program of giving account of knowledge of nature on the language model. The project of these two works in which the language model of nature plays the central role is the construction of the ‘theory of sensory representation’ which opposes the Cartesian rationalist view of natural knowledge. According to rationalists, our senses
are unreliable guide to knowing physical things because they generally give us distorted representations of the true nature of them: it is by ‘intellect’ or ‘pure understanding’ which clearly and distinctly perceives geometrical extension that we grasp the true nature of physical things. In opposition to this, Atherton explains, what Berkeley tried to establish in the *New Theory* in the special case of vision and later in the *Principles* in its general application is the thesis that our senses are reliable guide to natural knowledge: his language model has a positive message that our *senses* adequately work in knowing nature. If we accept the Cartesian model of natural knowledge that it is to be founded on clear comprehension of geometrical extension, then our senses always falls short of this model. But if we embrace the language model of nature, knowing nature is ‘a matter of expanding the associations among ideas’ which are perceivable by the senses. Thus, the positive moral underlying in the *New Theory* and the *Principles* is that ‘our senses are suited to inform us of “the settled laws of Nature” which constitute our knowledge of the natural world’.12

12 Atherton further develops this interpretative proposal to read the *Principles* (and the *Three Dialogues*) in terms of the language model of the *New Theory* in ‘Corpuscles, Mechanism, and Essentialism in Berkeley and Locke’, *Journal of the History of Philosophy* 29 (1991). In this paper, she discusses Berkeley’s view of scientific knowledge of nature, and suggests that Berkeley can reconstrue the existence of minute corpuscles along his own language model of nature. That is, what he wants to quarrel about the corpuscularian account of nature is the essentialist or geometrical interpretation of it, according to which there must be ‘necessary’ or ‘intrinsic’ connection between corpuscular substructure and perceivable phenomena. He may well, however, accept corpuscularianism by interpreting it in conformity with his linguistic, associationist view of the laws of nature. Thus, in the context of science again Atherton interprets Berkeley’s position by contrasting it to the essentialist ideal of Cartesian physics: ‘Berkeley can be said to be opposed to physical theory derived from the Cartesian model, and to be more favourably inclined to physics on a Newtonian model’ (p.67; see also p.51). In ascribing ‘a Newtonian model’ of physics to Berkeley, Atherton seems to conceive the inductivist model of scientific procedure, as she remarks: ‘Berkeley replaces this picture of physical science as pinned to the notion of an essence with one in which it is the task of the physical scientist to construct explanations in terms of laws, understood in Berkeley’s sense as general principles derived from phenomena which render an event understandable by showing how it can be accommodated under laws of increasing generality’ (p.62; see also *Berkeley’s Revolution in Vision*, pp.239-40). But as I will discuss in section 3 of this chapter and in chapter 4, while in the *Principles* Berkeley can be seen as following Newton’s (professed) inductivism about knowledge of laws, he departs from it towards the middle period. In *De Motu*, he subscribes to the hypothetico-deductive model of mechanics and considers the laws to be the *premises* of an axiomatic system rather than the generalizations of observable regularity.
Now I agree that by using the language model in the *New Theory* and the *Principles* Berkeley intended to defend the reliability of sense perception in opposition to the Cartesian rationalists’ dismissal of its epistemological value. But, in the first place, it does not seem to me that Atherton’s interpretation of Berkeley’s use of the language model in terms of the principle of association adequately captures his view of knowledge of the laws of nature. Secondly, Atherton’s assessment of Berkeley’s relationship to Cartesian account of the significance of sense perception for natural knowledge is not quite correct: Descartes and Malebranche (in whom Atherton sees the chief target of Berkeley in the *New Theory*) do not simply dismiss the significance of the senses, assigning them the *useful* function for the purpose of preserving our bodies.

As to the first point, I have been putting emphasis, in section 2, on the pragmatic approach in Berkeley’s treatment of knowledge of the laws of nature, particularly highlighting his remarks on the pragmatic function of divine natural language that it equips us with the ability of ‘foresight’ by which we regulate actions for the well-being of life. By calling attention to this pragmatic approach underlying in his use of the language model, I observed that knowledge of laws for Berkeley essentially involves the ability of *action* rather than mere perception: we are said to know the laws of nature when we can act with ‘foresight’ and arrange necessary means so that we successfully attain sensible pleasures and avoid pains. This ability of acting by ‘foresight’ is developed with various degrees of sophistication, from the level of instinctive response (taking foods/sleeping) to the level of deliberative actions which involve judgements about the long and complex means-end connections (sowing seeds for the future harvest). But Atherton’s interpretation, which sees Berkeley’s language model as putting forward a ‘theory of sensory representation’, conceives knowledge of laws in terms of *perception* rather than the ability of action. This is suggested by her remark that knowing laws for Berkeley is ‘expanding the associations among ideas’. In my view,

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13 Berkeley’s *Revolution in Vision*, p. 18. According to Atherton, this rivalry with Cartesians should also be read as extended to the *Principles* (p.232).
however, the core insight of Berkeley’s divine language model of nature lies in the thought that God instructs us by his speech how to act in the natural world. I observed that this insight about the pragmatic function of God’s natural language is to be understood in connection with Berkeley’s remark on the emotive use of language in the Introduction to the Principles.

This standpoint which sees divine natural language in terms of the pragmatic function is related to the second point. Berkeley’s relationship to the Cartesian view of sense perception, as I see it, is not as antagonistic as Atherton describes. It is true that Berkeley is definitely opposed to the view that the senses generally distort the true nature of physical things and never lead us to knowledge of them. Even so, he had much to learn from the view, suggested by Descartes and further developed by Malebranche, that the senses serve generally well for our bodily maintenance. In the first book of the Search after Truth, Malebranche took pains to undervalue the senses considered as the means to know ‘the truth of things in themselves’, but this theme was developed in close connection with the claim that the senses serve for the body’s welfare and only teach us things as relative to the body. The errors of sense, which Malebranche illustrates through the case of vision, properly belong not to the sense but to voluntary judgements which mistake its representations as showing us the true nature of things. In terms of the biological function, the senses work ‘perfectly well’: ‘Through pleasure and pain, through agreeable and disagreeable tastes, and by other sensations, they so quickly advise the soul of what ought and ought not to be done for the preservation of life’.

Pleasant sensations are ‘signs’ which inform us that what is going on in the body is conducive to preservation of the body, and pains are ‘signs’ of something going wrong in the body.

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14 Malebranche, Search after Truth, Book I, chapter 5, section 1 (I.O. 23). In Elucidation XIII, Malebranche vindicates ‘the soundness, precision, and admirable order’ of our senses (I.O. 645ff.).

15 Search, Book V, chapter 3 (I.O. 348): ‘sensations of pleasure and pain … are … the soul’s natural signs (marques naturelles) for distinguishing good from evil’. See also Book I, chapter 10, section 5 (I.O. 51-2).
There is no doubt, as McCracken pointed out\textsuperscript{16}, that Berkeley’s language model of nature owes, at least partly, to Malebranche’s discussion of the pragmatic significance of the senses in the first book of the *Search*. For Malebranche, the primary function of the senses is to provide us with ‘signs’ which are useful to the bodily maintenance. And his theory of ‘natural judgement’ which is elaborated in discussion of vision develops the theme that God constantly acts for us in the function of vision\textsuperscript{17}: whenever we open our eyes, the immediate presentation of visual landscape occurs by virtue of the involuntary judgements about figure, size, and distance of bodies which in fact are not our own but God’s making. These involuntary natural judgements utilize certain ‘signs’ or means to work out spatial properties of bodies, and God performs them ‘for us, in us, and in spite of us’ in order to enable us to adapt ourselves quickly to the circumstances. Atherton gives an excellent sketch of Malebranche’s theory of vision and natural judgement in her book, but she does so only to formulate Berkeley’s target\textsuperscript{18}. She justly contrasts the aspects of Malebranche’s account that visual perception is conceived on the model of geometrical reasoning, that natural judgements are not empirically acquired but inborn with us, with Berkeley’s associationist, empiricist account of vision. But if we see Berkeley’s language model from its pragmatic aspect that God constantly directs our actions by sensible signs for the well-being of our body, Malebranche cannot simply be characterized as his target. Berkeley’s departure from Malebranche consists in his denial of ‘knowledge of things in themselves’ allegedly attainable by pure intellection of ‘the idea of extension’, as contrasted to the useful function of vision which concerns knowledge of things only as relative to the purpose of preserving our body\textsuperscript{19}.

To sum up the above discussion, the chief point of my interpretation of Berkeley’s language

\textsuperscript{17} See Luce, *Berkeley and Malebranche*, p. 40ff.
\textsuperscript{19} The following difference is also worth noting: while Malebranche considers pleasure/pain to be signs of the *present state* of the body, Berkeley considers visual ideas to be signs of the pleasure/pain we have in consequence of certain actions, i.e. signs of the *future state of the body*. 

156
model of nature is that we can clearly see in it the pragmatic view of knowledge which conceives
the nature of knowledge in terms of the ability of action. In the New Theory and the Principles,
Berkeley gives the account of knowledge of laws on the language model, according to which
knowledge of the lawful order of nature consists in the ability to regulate our actions in the given
circumstances, by direction of the language God speaks to us; one is said to know ‘the laws of
nature’ when he learned through experience the means-end connections and can ‘manage himself
in the affairs of life’ with ‘foresight’ (PHK.31), that is, when he generally does well in steering his
way in the everyday circumstances for attainment of pleasures and avoidance of pains.

3. Scientific knowledge as ‘the grammar of nature’

(1) Knowing the language of nature ‘by practice’ and ‘by rule’

In this section, I explore a new dimension in Berkeley’s account of knowledge of laws. Discussion
on the language model thus far is only applicable to knowledge of laws at the ordinary level. In the
Principles, however, Berkeley is not only concerned to account for the knowledge of nature which
we have and use in everyday ‘affairs of life’, where our chief interest is to ‘know how to act any
thing that might procure us the least pleasure, and remove the least pain of sense’ (PHK.31). In fact,
he uses greater space for discussion of the knowledge of natural phenomena which is aimed at in
the scientific studies of nature. Berkeley’s discussion of scientific knowledge in the Principles has
both negative and positive morals, as he draws them in his statement in section 66:

…it is the searching after, and endeavouring to understand this language (if I may so call it) of [second
dition: understand those signs instituted by] the Author of Nature, that ought to be the employment of
the natural philosopher, and not the pretending to explain things by corporeal causes.

157
As we see in this passage, Berkeley uses the language model in the *Principles* where he defines the proper business of natural philosophy. In the positive vein, he identifies the chief occupation of natural philosophy in the study of ‘the language of the Author of nature’ or ‘natural signs’ of God’s institution. The negative message concerns the point that causal explanation does not belong to natural philosophy. This negative moral is relevant to Berkeley’s critique of Newton’s physics and his alternative conception of the nature of scientific explanation, which I will explore in the second half of this section. In the first half of this section, I shall clarify how Berkeley, by reference to the language of nature, characterizes the nature of scientific knowledge of laws as differentiated from the ordinary-level knowledge of them.

The passage of section 66 quoted above clearly shows that scientific knowledge is constructed on the language model. Then it seems natural to ask whether ordinary knowledge and science, both of which are considered to be aiming at understanding ‘the language of the Author of Nature’, are continuous or different, and if different, how these two levels of knowledge are related to each other. For clarification of these points, it is helpful to start by looking at what Berkeley says in section 108.

It appears from sect. 66 etc., that the steady, consistent methods of Nature, may not unfitly be stiled the *language* of its *Author* … And to me, those men who frame general rules from the *phenomena*, and afterwards derive the *phenomena* from those rules, seem to be grammarians, and their art the grammar of Nature. Two ways there are of learning a language, either by rule or by practice: a man may be well read in the language of Nature, without understanding the grammar of it, or being able to say by what rule a thing is so or so. (PHK. 108; first ed.)

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20 In the second edition, this passage was revised as follows: ‘Those men who frame general rules from the *phenomena*, and afterwards derive the *phenomena* from those rules, seem to consider signs rather than causes. A man may well understand natural signs without knowing their analogy,
Here two ways of knowing ‘the language of Nature’ is distinguished, one ‘by rule’ and the other ‘by practice’. Berkeley thinks knowledge of natural language ‘by rule’ belongs to natural philosophy, contrasting it with knowledge of natural language which everyone acquires ‘by practice’. Knowledge of natural language possessed by natural philosophers is the ‘art’, which Berkeley calls ‘the grammar of Nature’. Thus in section 110, Berkeley refers to Newton’s *Principia* as representing ‘the best grammar’ of nature. There is no doubt, then, that Berkeley draws a clear line between ordinary and scientific knowledge. I will now articulate their difference and clarify the nature of scientific knowledge considered as ‘the grammar of Nature’.

In the preceding section, I developed the interpretation of Berkeley’s language model of nature which highlights the *pragmatic function* of the language of nature. As it has been observed, according to Berkeley, knowledge of divine natural language consists in the *ability of regulating actions* by direction of this language for the well-being of our body, i.e. the attainment of pleasure and the avoidance of pain. Thus, mastery of natural language at the ordinary level can be defined entirely from the pragmatic viewpoint, as being concerned only with the enhancement of the ability

or being able to say by what rule a thing is so or so'. Here, ‘the language of the Author of nature’ is replaced by ‘signs’, and there was another, parallel change from ‘language’ to ‘signs’ in section 66 as well. But this should not be taken as indicating any substantial changes in Berkeley’s position. The replacement is likely to have come from Berkeley’s later reflection on the nature of *vision* rather than from his second thought on *knowledge of nature in general*. As it can be seen from his discussion in the dialogue IV of *Alciphron* (sect.12), the restriction of the title of ‘language’ to objects of *vision* is undoubtedly connected with Berkeley’s project to demonstrate God’s existence from the premise that visual ideas literally constitute a language. The second edition revision of section 108 (and 66) corresponds to this necessity of restricting the criterion of ‘language’ for the use of it in theological context. Berkeley left intact his mention of ‘general grammar-rules’, ‘grammatical remarks on the language’, and ‘perusing the volume of nature’ in section 108 and 109 in the second edition. And it should also be noted that Berkeley continues to speak about the natural language of God and ‘the grammar of nature’ in *Siris* (sect. 252-4).

21 In the second edition, Berkeley replaced ‘the best grammar’ with ‘the best key for analogy or natural science’. This seems to indicate that in the second edition Berkeley uses the term ‘analogy’ in a technical sense in which it refers not just to phenomenal similitude but to the common feature or structure of phenomena which is to be defined by certain formulated ‘general rules’.

159
of action in everyday circumstances: ordinary knowledge of nature is certain skilfulness in arrangement of the situations which would be profitable to our living. As I discussed by reference to section 32, the skilfulness in directing actions for the life’s well-being can be grounded on various extensiveness of ‘foresight’. At the lowest level, we may response to sensible signs we perceive in a certain circumstance (e.g. seeing food/ feeling sleepy) by taking actions which immediately bring about pleasant states of the body. At the higher level, our response to sensible signs involves deliberations about a long series of the means-end connections (e.g. sowing seeds when it gets warmer) and thereby be directed to the attainment of pleasures placed at a remote future in ‘the ordinary course of things’. Ordinary knowledge of nature, therefore, is the ability of regulating actions in the pursuit of pleasure with various extensiveness of ‘foresight’, which relies on the past experience of the connection of ideas in ‘the ordinary course of things’.

How then is scientific knowledge of nature to be characterized in relation to such ordinary-level knowledge of nature? As it is stated in section 108, the central concern of natural philosophers, as ‘grammarians’ of nature, is to formulate ‘general rules’. And this feature of scientific knowledge confers natural philosophers the advantage which Berkeley calls ‘a largeness of comprehension’.

If … we consider the difference there is betwixt natural philosophers and other men, with regard to their knowledge of the phenomena, we shall find it consists … in a greater largeness of comprehension, whereby analogies, harmonies, and agreements are discovered in the works of Nature, and the particular effects explained, that is, reduced to general rules … (PHK.105)

Ordinary people and natural philosophers differ not in what they are concerned with, for they equally aim at learning the phenomena perceivable by the senses. But natural philosophers differ from ordinary people in the method of learning them: the primary concern in their study of natural
phenomena is identification of ‘general rules’. Natural philosophers would not engage in following
‘the course of nature’ in direct experience but instead aim to discover the ‘general rules’ according
to which natural phenomena occurs. They are just like a grammarian who does not engage in
communication or linguistic discourse but instead concentrates on the ‘rules’ people follow in the
manipulation of language. This method of concentrating on the ‘rules’ of phenomena (‘general
grammar-rules’ (PHK.108)) instead of phenomena themselves gives natural philosophers a great
advantage in pursuit of extensive knowledge of phenomena. Knowledge of the language of nature
‘by rule’ affords the ability of prediction which extends far beyond the scope of phenomena with
which ordinary knowledge of nature is concerned.

Learning natural language by everyday practice, as we have seen, involves knowing ‘rules’ and
having ‘foresight’. But this knowledge of ‘rules’ largely remains implicit: in the everyday context,
general rules as such are rarely made the object of reflection and study. In ordinary ‘affairs of life’,
knowledge of the laws of nature is directly anchored in the use and application of it for actions. We
learn the regular orders between ideas of sense, whether spatial orders or causal orders, through
doing things in concrete situations: we learn through actual performance, ‘if we do such and such,
we will obtain such and such’. Thus knowledge of laws at the ordinary level is manual and
pre-theoretical: it is concerned with knowing ‘how to act things’, as Berkeley put it in section 32.
But at the level of scientific studies, knowledge of ‘rules’ is made explicit: the chief concern of
scientific knowledge as ‘the grammar of nature’, as it is said in section 108, is concerned ‘to say by
what rule a thing is so or so’. This involves a clear division between the apprehension of laws and
the use of that apprehension in regulation of actions. That is to say, natural philosophers understand
the laws of nature without direct engagement with sensible reality. And this is why they accomplish

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22 This may well be an oversimplification, since making instruments to enhance the power of
regulating our actions requires reflections on how we utilize the regularity of nature in doing things.
The invention of instrument is a forerunner of science, and ordinary knowledge of nature already
involves the scientific method of making explicit the ‘general rules’ of natural language.
a larger comprehension of perceivable phenomena than ordinary people do. For, making the laws of nature explicit to awareness as the object of study, they can compare the one with another. And by such method of comparing the formulated laws they can proceed to discover the laws of more general application which subsume less general laws under them.

Scientific progress consists in the discovery of hitherto unknown ‘analogies, harmonies, and agreements in the works of Nature’ by the method of formulating the ‘general grammar-rules’ of God’s language and bringing them to comparison. At the everyday level, we are familiar with such regularities as the stone’s free falls, the moon’s motion in the sky, and the tides. We know how to do things, by utilization of the regular phenomena we learned through the activity of everyday life, in pursuit of the well-being of our body. This kind of knowledge may properly be termed ‘habit’ or ‘perceptual adaptation’, and it generally works well in the familiar circumstances in which it is acquired. Ordinary knowledge of natural language consists in such habitual adaptation to the immediate circumstance for self-preservation. Natural philosophers, however, suspend, at least for the moment, everyday concern of adaptation to the immediate circumstance. Instead of directly utilizing natural language in pursuit of the profitable things, i.e. sensible pleasures or goods, they focus their attention on the general rules of this language. Concentrating on the ‘general grammar-rules’ of God’s speech to us, they discover the ‘analogies’ underlying natural phenomena in different parts of nature. Thus, as the study of natural philosophy advances, the free fall of bodies, the moon’s diurnal motion in the sky, and the tides, are, by the method of ‘nice observation’ and ‘comparison’ (PHK.105) brought to be encompassed by the most general ‘grammar-rule’, namely, the law of ‘mutual attraction’ or gravitation. This is what Newton’s Principia, which Berkeley calls ‘the best grammar’ of the language of nature, admirably accomplished.

To sum up what Berkeley conceives as the distinctive features of scientific knowledge of laws, ‘the grammar of nature’, in comparison with ordinary knowledge acquired ‘by practice’:
1. Knowledge of ‘general rules’ of phenomena remains *implicit* at the ordinary-level knowledge of laws, whereas ‘general rules’ are made the *explicit* object of reflection at the scientific level.

2. Ordinary knowledge is concerned to *use* the regularities of nature for the life’s welfare, whereas scientific knowledge is concerned to *study* the regularities as such and ultimately aims to integrate them to the most encompassing laws.

The ‘greater largeness of comprehension’ which Berkeley attributes to natural philosophers is derived from these features of scientific method.

Now, as we saw in section 2 above, knowledge of laws at the ordinary level is the ability of ‘foresight’ which directs us in everyday circumstances in the effort to ‘procure us the least pleasure, and remove the least pain of sense’ (PHK.31). Likewise, scientific knowledge involves the acquisition of predictive ability as ordinary knowledge does. But the predictive ability at the scientific level is not necessarily aiming at ‘pleasure of sense’. Rather, as Berkeley indicates in section 105, the pleasant thing which is aimed at through the exercise of scientific ‘foresight’ is not sensible pleasures but the comprehensiveness of prediction itself.

... [general rules which are] grounded on the analogy, and uniformness observed in the production of natural effects, are *most agreeable, and sought after by the mind;* for that they extend our prospect beyond what is present, and near to us, and enable us to make very probable conjectures, touching things that may have happened at very great distances of time and place, as well as to predict things to come; *which sort of endeavour towards omniscience, is much affected by the mind.* (my italics)

While ordinary knowledge, being developed through habitual adaptation to the immediate
circumstance, affords ‘foresight’ of a very limited scope, scientific knowledge, by virtue of having the integrated understanding of the regularities in different parts of nature, affords ‘foresight’ which extends far beyond the immediate circumstance. Such encompassing vision will be useful, as Berkeley observes in section 62, ‘to the framing artificial things for the use and ornament of life’. But apart from its possible application to the life in the immediate circumstance, the comprehensive vision of ‘the whole chain of natural effects’ (Ibid.) which is afforded us by scientific ‘foresight’ is enjoyable by itself. The predictive ability at the ordinary level is acquired in the ‘affairs of life’ in pursuit of sensible pleasure, which is located at a certain point (near or remote) in the regular course of nature; the development of the predictive ability at the scientific level, by contrast, is motivated by our mind’s aspiration for the comprehensive vision of ‘the whole frame of Nature’, the acquisition of which gives us intellectual gratification or rational pleasure.

Although scientific knowledge of laws or prediction does not necessarily aim at the application of it for the comfortable state of life in the immediate circumstance, it is still to be noted, I hasten to add, that it involves an adaptation to the circumstance in a larger scale. Scientific knowledge of laws is no less appropriately characterized as the ability of action than ordinary knowledge. It is true that the prediction in science is not always followed by actions which aim to produce the predicted perceptual experience, as it is the case of ordinary knowledge. But Berkeley clearly holds that scientific prediction is concerned to formulate the conditional statement which connects the actions.

23 The cultivation of the ‘comprehensiveness of mind’ or ‘largeness of the mind’ is an important theme of Berkeley’s philosophy. In the Guardian Essay no.70, Berkeley speaks of, referring to Plato’s Theaetetus, ‘that frame or disposition which is called largeness of the mind’, and observes that ‘Philosophy doth open and enlarge the mind by the general views to which men are habituated in that study, and by the contemplation of more numerous and distant objects than fall within the sphere of mankind in the ordinary pursuits of life’. Then he goes on to remark, ‘As all parts and branches of philosophy, or speculative knowledge, are useful, in that respect, Astronomy is peculiarly adapted to remedy a little and narrow spirit’ (Works, vol.VII, p.207). In the Guardian Essay no. 62, he develops the notion of ‘the scale of pleasure’ through which the mind arises from the enjoyment of sensible pleasure to the higher, rational kind of pleasure (Works, vol.VII, p.203).
we may possibly take in a larger circumstance and the experience which would follow them.

We may, from the experience we have had of the train and succession of ideas in our minds, often make, I will not say uncertain conjectures, but sure and well-grounded predictions, concerning the ideas we shall be affected with, pursuant to a great train of actions, and be enabled to pass a right judgement of what would have appeared to us, in case we were placed in circumstances very different from those we are in at present. Herein consists the knowledge of Nature, which may preserve its use and certainty very consistently with what hath been said. (PHK.59; my italics)

As we have seen in the preceding section, Berkeley conceives knowledge of laws (knowledge of space and causality) as the ability of action and not as the ability of perception. At the ordinary level, we have ‘foresight’ that ‘if we take food we will be nourished’, ‘if we approach fire we will be warm (or burned)’, and actually apply this foresight in the given circumstance in which we are: to know the lawful order of nature is to have the ability of acting with ‘foresight’, rightly arranging the means in order to have pleasure and keep away from pains. At the level of scientific knowledge, however, the understanding of phenomena does not consist in habitual adaptation to the familiar circumstance on the earth, since it is concerned to predict ‘things that may have happened at very great distances of time and place’. Thus, scientific knowledge of laws involves the ability of predicting the experience in the counterfactual situations: predictions about what would happen if we were in the circumstance and acted in it. The adaptation at this level is only virtual or simulative, but it is still an adaptation to the real circumstance, as opposed to the only imaginary one: however remote and unfamiliar the circumstance with which scientific prediction is concerned may be (e.g. the outer space), it is the circumstance which is analogous to the immediate circumstance and which we may reasonably be supposed to be able to reach. Therefore, the point that Berkeley
subscribes to the pragmatic view of knowledge applies to scientific knowledge as well.

(2) ‘Similitude’ and ‘analogy’: ‘attraction’ and the nature of scientific explanation

Berkeley’s reconstrual of scientific knowledge on the language model is intended to replace the widely accepted picture of natural philosophy, according to which the aim of scientific study of nature is to explain phenomena by physical causes. According to this accepted view, complete knowledge of nature rests on the identification of essential qualities of physical things which are responsible to the production of observable phenomena, and the proper task of natural philosophy is to render diverse natural phenomena intelligible by showing how they ‘flow from’, i.e. necessarily results from, a few essential qualities of bodies.

As Berkeley observes in the Principles, essential qualities of bodies were popularly identified by the moderns (Cartesians, Boyle and Locke) with ‘mechanical’ or ‘primary’ qualities such as figure, size and motion, as distinguished from ‘sensible’ or ‘secondary’ qualities such as colours, sounds and tastes. Mechanical or primary qualities are those possessed by insensible corpuscles which constitute the physical things we encounter on the phenomenal level, and the insensible constitution of corpuscles is conceived as being perpetually modified by motions of component corpuscles and the mutual impact between them. Sensible (or ‘secondary’) qualities, appearing in the macro physical objects on the phenomenal level, are not in insensible corpuscles on the micro level. Explanation in natural philosophy is accomplished, therefore, when certain phenomena or perceivable properties of bodies were shown to be reduced to these ‘mechanical causes’, to ‘the figure, motion, weight, and such like qualities of insensible particles’. For Berkeley, however, such pretension of natural philosophers to mechanical causal explanation is wholly in vain, since ‘in truth, there is no other agent or efficient cause than spirit’ (PHK.102). According to his renewed
picture of scientific knowledge, the study of physical causes never belongs to natural philosophy. All talks about mechanical causes are redundant, and natural philosophy is properly characterized as ‘the grammar of Nature’ which aims at reducing natural phenomena to ‘general rules’.

Berkeley believes his proposal to do natural philosophy without causal explanation is beneficial to the advancement of scientific knowledge in that it emancipates philosophers from ‘many hypotheses and speculations’ and thereby ‘abridges’ useless labours and disputes. When he speaks about ‘hypotheses’ in section 102, Berkeley has chiefly in mind the corpuscular hypothesis of modern philosophers, according to which we should ‘explain the production of colours or sounds, by figure, motion, magnitude and the like’ of insensible corpuscles. As we saw before in chapter 2, he dismisses this ‘hypothesis’ for the reason that sensible qualities like colours and sounds are never better known by tracing them back to insensible primary qualities of corpuscles: we know those secondary qualities perfectly well on the level of sense perception, and it is useless for philosophers to have recourse to the insensible causal origin to make them more intelligible. But Berkeley’s target in his attack on the use of ‘hypotheses’ in natural philosophy is not confined to that of corpuscularians who use it to give causal ‘explanation’ of secondary qualities. In the next section 103, he turns to ‘the great mechanical principle now in vogue’, i.e. attraction, arguing that this alleged explanatory principle is as vain as the mechanical hypothesis of corpuscularians. Various phenomena which agree in mutual approach of bodies, such as the falling of bodies, the tides, cohesion and crystallization, are currently given explanation on the principle of ‘attraction’, but this, he observes, actually does little for the progress of scientific knowledge: ‘That a stone falls to the earth, or the sea swells towards the moon, may to some appear sufficiently explained [by attraction]. But how are we enlightened by being told this is done by attraction?’

Berkeley uses considerable space for attacking the concept of ‘attraction’ in the Principles.
Attraction, or ‘gravitation’, is the central principle which Newton invoked in the *Principia*. In Newton’s ‘system of the world’, physical phenomena from the earth to the heaven were shown to be integrated under the single principle of gravitation. But Newton, unlike Descartes and his successors in the continent, did not adhere to the mechanist ideal that ‘attraction’ should be ultimately reducible to the principle of motion and impact. Rather, he regarded attraction as irreducible to the strict mechanical principle. This is why Berkeley had special concern to discuss ‘attraction’ at length after his quick dismissal of corpuscular hypothesis in section 102. As Newton’s physics was on the way to establish its authority among the British when he wrote the *Principles*, Berkeley thought it necessary to use more space on ‘attraction’ than on corpuscular mechanism. Now Berkeley rejects Newton’s principle of attraction insofar as it is supposed to give *causal* explanation of natural phenomena, and his attitude to it appears as dismissive as to the mechanist corpuscularian principle. But at the same time it is noticeable that he is not quite opposed to the use of the concept of ‘attraction’ in scientific explanation. His discussion of ‘attraction’ contains a positive suggestion about what Newton’s explanation by ‘attraction’ really does accomplish while denying that it amounts to *causal* explanation. As we are now going to see, Berkeley gives the concept of attraction a role to play in the scientific explanation in his phenomenalist framework. However, the phenomenalist interpretation of attraction in the *Principles* is, as we will see, unsatisfactory in terms of Newton’s actual practice in the *Principia*.

The passage of section 103 quoted above suggests that ‘explanation’ of the stone’s downward movement to the earth and the sea’s swelling towards the moon by ‘attraction’ is useless, having nothing substantial in it to instruct us about the phenomena in question. Thus he continues:

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24 Properly speaking, the concept of ‘attraction’ has more extensive application than that of ‘gravity’ or ‘gravitation’. In Newton’s physics, ‘gravity’ is a kind of attractive force which acts in accordance with the inverted-square law, but Newton refers to other kinds of ‘attraction’ whose operation follows other laws, such as ‘magnetism’ and ‘electricity’. See *Optics*, q.31. For our purpose here, there will be no problem to use ‘attraction’ and ‘gravitation’ interchangeably. Berkeley himself does not refer to ‘attraction’ as distinguishable from ‘gravitation’ until *Siris*. 168
Is it that that word signifies the manner of the tendency, and that it is by the mutual drawing of bodies, instead of their being impelled or protruded towards each other? But nothing is determined of the manner or action, and it may as truly (for ought we know) be termed impulse or protrusion as attraction.

... I do not perceive that any thing is signified besides the effect it self; for as to the manner of the action whereby it is produced, or the cause which produces it, these are not so much as aimed at.

Philosophers are deluded to think that they are giving instructive explanation by using the concept of attraction because they have the term ‘attraction’ denote some essential quality or power, which lies hidden in stones, water, the earth, and the moon, causing their observable behaviours. But in truth they mistake their job. For this explanation does not specify the true physical mechanism of causation at all, and the term ‘attraction’ here is replaceable with ‘impulse’ or ‘protusion’ without changing the validity of explanation. As Berkeley sees it, the term ‘attraction’ actually denotes nothing other than ‘the effect itself’, namely, the phenomena of the tendency of bodies towards each other (and for this purpose the term ‘impulse’ would equally do). But then the purported explanation by the concept of attraction comes down to a mere tautology: the proposition that stones move downward by ‘attraction’ of the earth says nothing more than that stones move downward because they move downward.

This critique of ‘attraction’ looks like a continuation of the attack on Newton’s physics by Cartesian mechanist philosophers who considered any legitimate explanation in natural philosophy to be given exclusively in terms of figures, motions, and impulsive forces. But of course, Berkeley’s chief point is not to accuse Newton, in alliance with continental critics such as Leibniz and Fontenelle, of the illegitimate reliance on the ‘occult quality’ irreducible to mechanical qualities. Here we should remember that he equally opposes the project of explaining natural phenomena by
reducing them to a few fundamental mechanical qualities. Exposing the emptiness of the concept of ‘attraction’, Berkeley is not calling for strict foundation of scientific knowledge on the qualities of properly ‘mechanical’ sorts. Rather, he is suggesting that natural philosophy can do well without being troubled by any ‘hypotheses’ about invisible entities: our understanding of phenomena depends not on the supposition of ‘occult’ attractive forces which inexplicably act at a distance nor on the supposition of the (more ‘intelligible’) micro mechanism which works by impulsive action between corpuscles; rather, it depends on the identification of observable similarities.

... if we take a view of the several phenomena, and compare them together, we may observe some likeness and conformity between them. For example, in the falling of a stone to the ground, in the rising of the sea towards the moon, in cohesion and crystallization, there is something alike, namely an union or mutual approach of bodies. ... [A] philosopher whose thoughts take in a larger compass of nature, having observed a certain similitude of appearances, as well in heavens as the earth, that argue innumerable bodies to have a mutual tendency towards each other, which he denotes by the general name attraction, whatever can be reduced to that, he thinks justly accounted for. (PHK.104)

Thus, according to Berkeley, Newton’s physics is only concerned to look out for and identify ‘a certain similitude of appearances’, that is, ‘a mutual tendency of bodies towards each other’, by observation and comparison of phenomena. The proper assessment of Newton’s accomplishment in Principia is, therefore, that it has succeeded in the task of collecting diverse natural phenomena of the very extensive scope, from the earth to the heaven, under ‘the general name attraction’, regarding their observable similarity. And for Berkeley, to collect diverse observable phenomena under the general term ‘attraction’, as it is stated in the next section 105, amounts to subsuming them under a formulated ‘general rule’, i.e. under the law of gravitation.
In this picture of Newton's physics, the concept of 'attraction' is still allowed to play a nominal role in the progress of scientific knowledge. The term 'attraction' does not signify hidden 'mechanical' qualities which are to be ultimately identified as the true cause of phenomena, nor does it signify some 'occult quality' irreducible to mechanical causes. The concept of 'attraction', therefore, is empty when it is used for causal explanation of natural phenomena. But insofar as 'attraction' is taken to signify the similitude between observable phenomena themselves instead of their underlying causes, it plays a role in explanation: scientific explanation of phenomena by the concept of 'attraction' is a process of assimilating unfamiliar phenomena to the well-known phenomena and thereby making the unfamiliar intelligible to us. Thus, it is empty to explain a stone's falling by 'attraction': since we are already familiar with it, it never calls for assimilation to other more familiar phenomena. But tidal movements in relation to the moon demands explanation, and natural philosophers provide us with the demanded explanation by pointing out, using 'the general name attraction', the similarity between the movement of the sea towards the moon and the movement of stones to the earth. In this latter case, the explanation is not empty because we thereby resolve our puzzlement about the unfamiliar event which occurs in relation to the moon by assimilation to the familiar events which occur in relation to the earth. The concept of 'attraction' is, therefore, useful and significant insofar as it renders what initially appeared anomalous 'only a particular example of a general rule or law of Nature' (PHK.104). But the assimilation of diverse phenomena by application of this concept does not involve assignment of physical cause which produces observable similitude between the behaviour of stones and the tides. The term 'attraction' denotes just a phenomenal similitude of the bodies' tendency towards each other, and the explanatory power of the concept of attraction is derived from its function of directing our attention to such (hitherto unnoticed) similitude between phenomena.

Berkeley's phenomenalist reconstrual of the concept of 'attraction' and its explanatory role in
Newton's physics may well appear problematic. For, while the leading ideal of modern philosophy was to go beyond surface phenomena to identify the deep structure for the true understanding of nature, Berkeley insisted that our knowledge of nature should remain, even at the scientific level, strictly within the realm of perceivable phenomena. The advantage of natural philosophers does not consist in their ability to penetrate into the reality which is unknown to ordinary people but just in horizontal expansion of knowledge about similarities between observable phenomena. From this viewpoint, the great success of the *Principia* is to be considered as resting on Newton's ability to 'take in a larger compass of Nature' than others did by following a simple procedure of 'nice observation' and 'comparison'. But is this assessment in accord with what Newton really does in the *Principia*? Berkeley thinks his phenomenalist interpretation of 'attraction' gets rid of useless 'hypotheses and speculations' which exercised natural philosophers including Newton. And Newton, to be sure, in the general scholium of the *Principia*, added in its second edition (published two years after Berkeley's *Principles*), distanced himself from the method of 'hypotheses': 'whatever is not deduced from phenomena, is to be called an hypothesis; and hypotheses, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy'\(^{25}\). Thus Newton seems to restrict his concern to the study of observable phenomena. While he claims to 'have explained the phenomena of heavens and of our sea, by the power of Gravity', he admits at the same time that he has 'not yet assigned the cause of this power'\(^{26}\). Is Berkeley's phenomenalist proposal, then, not fairly in line with Newton's self-assessment of the job of his 'experimental philosophy' which pretends not to bother with the realm of *causes*?

However, the situation really is not as simple as this. It is clear that Newton’s impressive integration of the terrestrial and celestial phenomena by the law of gravitation essentially depends

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\(^{26}\) Ibid.
on the distinctive method of analysis he employed in the *Principia*: he analyses all kinematic phenomena in terms of the component forces which produce them. As is well known, crucial to Newtonian mechanical system is the distinction between the inertial motion and the accelerated motion by impressed force. Newton successfully reduced the orbital motions of planets to the law of gravitation by considering them to result from composition of two elements, i.e. the rectilinear motion on the tangent, which is due to the inertial force of each planet, and the accelerated motion towards the sun, which is due to the gravitational force. Without such method of analysis, Newton could not have demonstrated that the earthly phenomena of a stone’s falling and the orbital motion of the moon follow the same law of gravitation. But according to Berkeley, Newton’s achievement should be conceived as resting on nothing more than the discovery of similarities, on the mere observational level, in the general patterns between the movements of stones and those of the moon. The obvious difficulty with this assessment of Newton’s mechanics is that at the observational level the stone’s movement and the moon’s motion are far from similar, the one describing a straight line to the earth (or a parabolic path gradually descending to the earth) and the other describing a circular figure around the earth. If mere observation of their similitude leads us to the discovery of the law of gravitation, why did philosophers before Newton fail to do so? Indeed, history of physics tells us that the founding fathers of modern science took great pains to overcome the Aristotelian preconception that movements of earthly things and those of celestial bodies belong to entirely different order (the notion of natural motion as circular in heaven but as straight on the earth). Indeed, this preconception had support from observation. Newton succeeded in subsumption of innumerable phenomena under the same general law by showing their similitude in the deep dynamic structure which underlies them, not just by pointing out their similitude at the surface phenomenal level. In spite of Newton’s remark about the gravitational law as a ‘manifest quality’, the success of his physics crucially rests on the identification of the hidden dynamic structure of
phenomena which is not manifest to direct observation.

What the concept of 'attraction' refers to in Newton’s mechanical system, then, cannot be such ‘similitude of appearances’ as is suggested by Berkeley, i.e. the bodies’ regular tendency towards each other. Rather, it should refer to something distinct from phenomenal similitude; otherwise it could not play a role to integrate apparent diversities of natural phenomena under the same law. It was because of his failure of grasping this point that Berkeley could regard stars and plants as giving counter examples to the *universality* of the gravitational law. In section 106, he points out:

> For example, gravitation, or mutual attraction, because it appears in many instances, some are straightway for pronouncing *universal*; and that to *attract, and be attracted by every other body; is an essential quality inherent in all bodies whatsoever*. Whereas it appears the fixed stars have no such tendency towards each other; and so far is that gravitation, from being *essential* to bodies, that, in some instances a quite contrary principle seems to shew it self: as in the perpendicular growth of plants, and the elasticity of the air.

This passage raises a complex issue about the relationship between the ‘essential quality’ of bodies and their ‘universal quality’, which Newton insists should be distinguished. But here let us concentrate on how Berkeley denies attractive force the status of the *universal quality* of bodies (and this point, I take it, amounts to how he rejects the *universal applicability of the law of gravitation* to the explanation of the bodies’ phenomenal behaviour). Berkeley argues against the

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27 In the commentary to the *Rule III* in the beginning of the Part 3 of the *Principia*, which Newton added to the second edition (1713), it is observed that gravity is *universal* to all bodies and that this can be established in the same way we establish that the other primary qualities of body are universal to all bodies, i.e. by using the method of ‘analogy’. In the third edition (1726), however, Newton made his point complicated by adding a brief remark at the end of his commentary to the *Rule III*, suggesting that he never regarded gravity as *essential* to all bodies. According to Newton, ‘inertial force’ can be counted as the essential quality of bodies, but gravity cannot.
universality of the gravitational law on the ground that stars, for instance, never appears to move towards each other. But if ‘the fixed stars’ can be judged in this way as constituting counterexamples to the gravitational law, the same judgement should apply to the high tide on the side of the earth on which it does not face the moon (or the sun). As we saw before, Berkeley is willing to allow the explanation of the tide by ‘attraction’ to be valid insofar as it is taken to involve assimilation of the unfamiliar phenomena to the familiar. But it is clear that quite a few phenomena should be excluded from Newton’s gravitational system of the world if assimilation between phenomena is thus conceived solely on the level of phenomenal similitude.

Berkeley’s phenomenalist reconstrual of the concept of ‘attraction’ and its explanatory role in Newton’s physics is, therefore, not in accord with what Newton actually does in the *Principia*. Although Newton claims that he discovered the law of gravitation by inductive generalization, observing that in his experimental philosophy ‘particular propositions are inferred from the phenomena, and afterwards rendered general by induction’, he actually never hesitated to use ‘hypotheses’ to establish his gravitational system of the world. Newton succeeded in deduction of the inverted-square formulation of the gravitational force from Kepler’s laws of planetary motion, which were empirically discovered, on the one hand, and *the* laws of motion on the other. But he never gave empirical justification of the laws of motion: they are postulated as hypotheses, or ‘axioms’ as he called them. The formulation of the laws of motion depends on the definition of

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28 In the *General Scholium* Newton guesses that the fixed stars are the centres of other systems just as the sun is the centre of the solar system, and that God ‘hath placed those systems at immense distances one from another’ lest gravitation cause their crash. *The Mathematical Principles of Natural philosophy*, p. 389.

29 Berkeley’s phenomenalist reconstrual of Newton’s system should also invalidate the first law of motion – according to which a body continue uniform motion in a straight line when there is no external force impressed on it. From the phenomenalist standpoint, this law can have no direct application with regard to observable phenomena.


31 To speak precisely, only the first and the second laws of motion are relevant for Newton’s procedure to deduce the inverted-square force of gravity from Kepler’s laws.
‘force’, which are classified by Newton in two sorts, the one ‘innate’ to the body (‘inertial force’) and the other ‘impressed’ on the body. Newton had no recourse to experience and observation in presenting his definition of these two sorts of forces. Thus, Newton’s concept of gravitation ultimately hinges on the general concept of ‘force’ and the laws of motion which Newton presented as fundamental premises of his mechanical system without empirical justification; in this sense he relied on ‘hypotheses’ to establish the law of gravitation. The concept of ‘attraction’ in Newton’s physics has such complex conceptual and theoretical background and is not directly anchored in plain perceptual experience. In the *Principles* Berkeley overlooked this point and his phenomenalist reconstrual of ‘attraction’ and its role in scientific explanation was unsatisfactory.

But Berkeley’s treatment of Newton’s mechanics in the *Principles* is not to be taken as representing his considered view. In the middle period work *De Motu*, he presents a more subtle interpretation of the nature of explanation in Newton’s mechanics which is more in line with what Newton actually does in the *Principia*. The key to understanding the development of Berkeley’s view of scientific explanation is his treatment of ‘hypotheses’ in *De Motu*. While in the *Principles* the concept of ‘attraction’ is interpreted as referring to ‘a certain similitude of appearances’ which is discoverable by observation and comparison of phenomena, it is not simply equated with such phenomenal similitude in *De Motu*. Rather, Berkeley there considers ‘attraction’, together with the general concept of ‘force’ and ‘action/reaction’, to be a ‘mathematical hypothesis’. This change in his conception of the status of the dynamical terms of Newton’s mechanics is closely coordinated with the development of his account of scientific explanation. The nature of scientific explanation as Berkeley puts forward in *De Motu* does not just consist in assimilating the unfamiliar phenomena to the familiar on the level of observable effects. Central to his new notion of explanation in science is the concept of ‘analogy’. To be sure, the view that the chief concern of natural philosophy is to look out for the ‘analogy’ between phenomena is already present in the first
But the important point is that as it can be seen in the above discussion, Berkeley initially conceived ‘analogy’ as nothing more than ‘a certain similitude of appearances’. Thus, Berkeley’s view of scientific explanation developed as he deepened the concept of ‘analogy’ to mean the hidden structural similarity of natural phenomena rather than their surface similarity. In accordance with the revised view of explanation, dynamical terms are assigned the status of ‘hypotheses’ which serves to make the invisible analogy of phenomena visible and thereby facilitate the integrated understanding of the whole universe by formulation of the encompassing general law. I will discuss these new developments in De Motu in the next chapter.

4. Signs, rules, and knowledge of number

(1) Knowledge of number and its pragmatic orientation

In this section, I explore Berkeley’s account of ‘knowledge of number’ and the nature of arithmetic in the Principles. Berkeley’s discussion of arithmetic is important for understanding his view of scientific knowledge of ‘the laws of nature’. Although such connection is not generally recognized in the literature, the positive aspect of Berkeley’s critique of Newton’s natural philosophy cannot be sufficiently understood without taking into account what he has to say about the nature of arithmetic. The importance of Berkeley’s view of arithmetic for understanding his account of natural philosophy is sufficiently confirmed by the discussion in Alciphron on science, where he explains the nature of scientific knowledge in general particularly by taking arithmetic (and algebra, which Berkeley conceives as a generalization of arithmetic) as a paradigmatic example of scientific knowledge. And in particular, Berkeley there juxtaposes the concepts of ‘number’ and ‘force’, indicating that what he observes on number can be easily extended to ‘force’, the central concept of the science of mechanics. Indeed, it was on the subject of number and arithmetic that he developed
the motif of *symbolic representation* in knowledge acquisition in the earliest: the performance and progress of arithmetic essentially depend on the use of artificial signs.

In the foregoing sections, I observed that Berkeley’s view of knowledge of laws is *pragmatic*. When he considers what it is to know the laws of nature, he conceptualizes knowledge not in terms of *perception* but rather in terms of *action*. We saw that Berkeley conceived knowledge of laws in terms of the ability of regulating actions with ‘foresight’. And in the previous section we explored his view that scientific knowledge, which is knowledge ‘by rule’ and achieves ‘a greater largeness of comprehension’ than ordinary knowledge, advances by the explicit formulation of the ‘general rules’, the laws of nature. But in the *Principles*, there is no detailed account of the structure of scientific knowledge which he called ‘the grammar of nature’. We can, however, take hints from his discussion on the nature of arithmetic about the direction Berkeley’s thought will take later in *De Motu* and *Alciphron* on the structure of knowledge which applies to mechanical science. In his account of arithmetic, he clearly favours pragmatic approach in clarification of its nature and gives a detailed account of the *role of symbols in knowing numbers*. Furthermore, in addition to the point that arithmetic provided Berkeley with the prototype of his view, fully developed in the middle period, that science is knowledge by symbolic representation, there is another important point I wish to clarify in this section. It is that for Berkeley knowledge by symbolic representation is knowledge of relations. Berkeley’s view of arithmetic has generally been interpreted as a champion of radical nominalism, according to which number is nothing but numeral ‘names’ or ‘signs’. Accordingly, he is often seen as tending towards ‘formalism’. But I will argue in the latter half of this section that the ‘formalist’ interpretation of Berkeley is not in harmony with his pragmatic approach to knowledge of numbers. Number, according to Berkeley, consists in the ‘relations’ of particular things which is *expressed by* arithmetical symbols, and that symbols are not the object of arithmetic but only the means by which we attain knowledge of number.
A remarkable point about Berkeley’s treatment of ‘knowledge of number’ is that he was clear from very early on that knowing ‘number’ does not consist in a kind of perceiving. Number is not some ‘ideas’ to be presented before the mind for perceptual apprehension, and therefore knowledge of number is not a kind of ‘intuitive knowledge’. This insight is relevant to both the negative and the positive phases of Berkeley’s treatment of arithmetic: in criticism of the received view of mathematicians, he observes that there is no ‘abstract number’ that is the object of perception distinct from particular sensible ideas; in the positive phase, putting forward his alternative account of the nature of arithmetic, he observes that arithmetic is the study of number which has usefulness in calculations and their applications to actions on things. In his discussion of arithmetic, therefore, the pragmatic view of scientific knowledge emerges in the earliest.

Berkeley’s target in the negative phase is the view that arithmetic is concerned with knowledge about ‘abstract ideas of number’. According to this view, there is ‘unity or unit in abstract’ separate from all concrete things we number, and mathematicians are supposed to study the ‘pure and intellectual’ nature of such abstract numbers, searching for their hidden properties and being ‘amused by’ mysteries about them. This Berkeley regards as the fundamental error of mathematicians. In truth, there are no such abstract numbers and abstract truths about them (PHK.118-9). This exposition of the error of mathematicians is a continuation of the attack on abstract ideas in the *Introduction*. As he argued there in general formulation, Berkeley’s moral is that it is a mistake to look for abstract ideas signified by the names of number: once we lay aside numeral names and figures, we find nothing but particular things numbered. Since number is commonly defined by mathematicians as ‘a collection of units’, abstract numbers are supposed to be collections of abstract units. But as for what is said of unity considered as ‘a simple or

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At the stage of the Notebook A (i.e. in the first half of *Philosophical Commentaries*), however, Berkeley held that knowledge of number consists in perception of ideas (e.g. PC.460). For discussion of his earliest view of number, see Bertil Belfrage, ‘The Clash on Semantics in Berkeley’s Notebook A’, *Hermathena*, 139 (1985), pp.120-3.
uncompounded idea’ accompanying every particular idea (Berkeley has Locke in mind here), he emphatically denies he has ‘any such idea answering to the word unity’ (PHK.I3). The reliance on such introspective method is certainly unsatisfactory, but Berkeley thinks it is sufficient to establish that there are no abstract units and hence no abstract numbers as their collections.33

Berkeley’s alternative to the received view is not, however, that since there are no abstract ideas of number, what we know by doing arithmetic are concrete things (‘ideas of sense’ and their collections). It is true that he thinks arithmetic is concerned with counting particular ideas of sense, but he never holds that just perceiving particular sensible ideas amounts to knowledge of number. Rejecting the view that knowing number consists in perceiving abstract ideas, he is not in favour of the view that it consists in perceiving particular ideas of sense. This is immediately clear from his discussion on the nature of number in section 12. There he argues that it is a mistake to suppose that there is the number intrinsic to each thing we perceive by sense, observing the relativity of number denomination: ‘the same thing bears a different denomination of number, as the mind views it with different respects’ (PHK.12). We can view, for example, the same particular sensible thing as ‘one book’, ‘100 pages’, ‘3000 lines’, or the same extension as one yard, 3 feet, 36 inches. Thus, it is clear that we can change as we please the ‘denomination’ of the same thing or idea, in accordance with arbitrary choice of unit in terms of varying interests. Hence ‘number is visibly relative, and dependent on men’s understanding’ (Ibid.). Through such consideration of relativity, Berkeley concludes that ‘number is entirely the creature of the mind’.

Now seeing that Berkeley rejects the view that knowledge of number consists in perception of abstract ideas of number by denial of ‘abstract unity’ is only effective to those who accept the definition of number as ‘collections of units’: there were some (Barrow and Newton) who conceived number as an abstract ratio between the same kind of quantities. Douglas M. Jesseph, Berkeley’s Philosophy of Mathematics, Chicago, 1993, pp. 100-01. At a deeper level, however, Berkeley challenges by his critique of abstraction the implicit assumption of abstractionists that abstract ideas should be something that can be conceived and identified exclusively of any names or signs. This line of critique is generally applicable to any conception of abstract number. Jesseph also notes this point. See op. cit., p.105.

33 Douglas Jesseph points out that Berkeley’s critique of abstract ideas of number by denial of ‘abstract unity’ is only effective to those who accept the definition of number as ‘collections of units’: there were some (Barrow and Newton) who conceived number as an abstract ratio between the same kind of quantities. Douglas M. Jesseph, Berkeley’s Philosophy of Mathematics, Chicago, 1993, pp. 100-01. At a deeper level, however, Berkeley challenges by his critique of abstraction the implicit assumption of abstractionists that abstract ideas should be something that can be conceived and identified exclusively of any names or signs. This line of critique is generally applicable to any conception of abstract number. Jesseph also notes this point. See op. cit., p.105.
ideas, whether they are abstract or particular, it seems natural to interpret him as opting for a radical nominalist position that numbers, or the objects which arithmetic is conversant about, are nothing other than written figures or names. Such interpretation is indicated by section 12, and is indeed supported by his argument in the notebooks. The thesis that ‘number is nothing but names’ is developed in the latter half of the notebooks, and there we see the prototype of the section 12 argument: ‘2 Crowns are called ten shillings hence may appear the nature of Numbers’ (PC.759). To this argument from relativity of ‘denomination’, Berkeley further adds another, instrumentalist consideration that a concise expression affords us an easier and clearer comprehension of number: ‘I am better inform’d & shall know more by telling me there are 10000 men than by shewing me them all drawn up’(PC.761). Later the same point is reinforced by pointing out that our calculating performance depends on notation: ‘The great use of the Indian figures above the Roman shews Arithmetic to be about Signs not Ideas, or not Ideas different from the Characters themselves’ (PC.803). Berkeley’s reasoning here seems that since our thought about number depends on the refinement of the means to express them, those means themselves are numbers. This argument appears rather simplistic, but this instrumentalist dimension of the ‘number is names’ thesis, as we see shortly, eventually leads him to a more sophisticated account of arithmetic.

Thus, Berkeley’s relativistic account of number in section 12, taken together with the arguments in the notebooks, seems to tend towards endorsement of radical nominalism. And his philosophy of arithmetic is usually taken by commentators to tend towards a certain kind of ‘formalism’ as is represented by David Hilbert. But what is really necessary for understanding Berkeley’s view is, it

seems to me, not to link it to various particular isms of contemporary philosophy of mathematics, but to reconstruct it in his own terms by close examination of the texts. The central insight of Berkeley about the nature of arithmetic is that arithmetic is a science of thoroughly practical service. His main point in criticism of the received view of arithmetic is that it is a mistake to look out for abstract units which are distinct from particular sensible things as the proper object of mathematical speculation. The knowledge which arithmetic is concerned with is not speculative construction by contemplation of abstract ideas of number but the application of our thoughts about numbers by the use of numeral signs to the direction of our actions: 'The theories ... in arithmetic, if they are abstracted from the names and figures, as likewise from all use and practice, as well as from the particular things numbered, can be supposed to have nothing at all for their object. Hence we may see, how entirely the science of numbers is subordinate to practice, and how jejune and trifling it becomes, when considered as a matter of mere speculation' (PHK. 120).

This emphasis on the essentially practical nature of the science of arithmetic, however, will not sit very well with the view that arithmetic is concerned solely with numeral names, figures, or signs. If the ultimate purpose of studying arithmetic, according to Berkeley, consists in the application of those numeral names and figures to the direction of actions on particular things, then mere possession of names and figures, together with the rules of their combinations and operations, does not constitute knowledge of number which arithmetic aims at. This point about the practical orientation of arithmetic is forcefully expressed in the following passage of section 122:

In arithmetic therefore we regard not the things but the signs, which nevertheless are not regarded for their own sake, but because they direct us how to act with relation to things, and dispose rightly of them. ...those things which pass for abstract truths and theorems concerning numbers, are, in reality, conversant about no object distinct from particular numerable things, except only names and characters;
which originally came to be considered, on no other account but their being \textit{signs}, or capable to represent aptly, whatever particular things men had need to compute.

Berkeley rejected the abstractionist ideal of arithmetic that knowledge of number rests on perception of the nature of abstract numbers. With equal force, he rejects the position that it simply rests on the possession of names, figures, and signs. If it is a grave mistake to look for the proper objects of arithmetic in abstract ideas distinct from numeral signs, it is equally a mistake to look for them in numeral signs themselves. It is particularly noteworthy that in the above passage Berkeley carefully avoids identifying the object of arithmetic exclusively either with ‘signs’ or the ‘things’ to which signs are to be applied. Here he adopts a somewhat elusive way of talking about numbers, saying that they are \textit{not distinct} from ‘particular numerable things, except only names and characters’. What is implied by this elusive way of talking is that ‘number’ is not to be taken as some \textit{separately identifiable thing}. Berkeley rejects the conception of number as ‘abstract units’, but he is opposed as well to the identification of number with ‘signs’ considered as just other sensible things. Numeral signs are certainly indispensable to arithmetic, but this is not because they are the \textit{objects} of knowledge but only because the ability to \textit{use} of them constitutes knowledge of number. In Berkeley’s view, knowledge of number consists not in \textit{perception or possession of numeral signs} but rather in \textit{the ability to use numeral signs for calculation of things}.

Berkeley’s treatment of arithmetic is developed thoroughly in terms of the pragmatic view of knowledge. His central point is that knowledge of number, which the science of arithmetic aims at, does not consist in \textit{perception} of abstract entities but in the ability of \textit{action}. It is important to note that Berkeley’s critique of the received view of arithmetic as the science of abstract ideas of number is not just directed at the allegedly abstract nature of number. Behind erroneous indulgence in abstraction he sees a more fundamental error, namely, the belief that arithmetical knowledge rests
on contemplation of ideas. Mathematicians wrongly suppose that there should be abstract entities which numeral names and figures stand for, and that the science of arithmetic, in its study of theorems and calculations, is concerned with the nature of such abstract entities and their relations which is discovered by perception or contemplation of them. But, as Berkeley sees it, the search for separately identifiable entities corresponding to numeral terms is wrongheaded. This second line of thought underlying his repudiation of abstract numbers is not pronounced in the Principles, where his pragmatic approach to knowledge still remains in the periphery. But it clearly emerges in his discussion of the nature of arithmetic in sections 119-122. Later in Alciphron we see the same line of critique is generalized as applicable to scientific knowledge in general. In the seventh dialogue of Alciphron, it is observed that science rests on ‘an apposite choice and skilful management of signs’, pointing out that ‘force and number, taken in concrete, with their adjuncts, subjects, and signs, are what everyone knows; and considered in abstract, so as making precise ideas themselves, they are what nobody can comprehend’ (Alc.VI-11; my italics).

(2) Knowledge of number as ‘knowledge of relations’

I have been putting emphasis on Berkeley’s pragmatic approach to arithmetic in his opposition to the received abstractionist view, but my discussion thus far leaves the question about the objects of arithmetic unsettled. All the answers suggested in the above seems negative: they are not abstract ideas of number, considered as collections of abstract units; nor are they particular sensible things which we count by the use of numeral names, figures, or signs; nor are they names, figures, or signs taken as such. What, then, is number according to Berkeley?

Prima facie, there seems to be two answers which suggest themselves through his discussion in the Principles. The one is the view that number is a collection of particular ideas which is put
together in terms of the arbitrarily chosen units. In section 12, he concludes that ‘number is entirely the creature of the mind’. As we saw, this is drawn from the relativity of ‘denomination’. He observes that we are free to change the assignment of number to the same thing in accordance with the choice of ‘unit’ made from varying interests. This argument rests on the view of number as ‘collections of units’, which Berkeley presumably accepts insofar as the unit is taken as a particular sensible thing such as one book or one yard of extension. The other view, on the other hand, identifies number with a name or sign. Berkeley’s argument in the notebooks points to the view that numbers are ‘nothing but names or characters’. Of these two alternatives, which is Berkeley’s option? In the following, I argue that neither correctly captures his view: his considered view is that number consists in the relations of particular things which are expressed by and apprehended through numeral symbols and which are some features in the things as distinct from symbols.

As I mentioned before, Berkeley’s philosophy of arithmetic is usually seen by commentators as a ‘formalist’. Douglas Jesseph, in his extensive and enlightening study of Berkeley’s philosophy of mathematics, observed that ‘Berkeley’s approach to arithmetic can be best characterized as a kind of formalism’. More exactly, Jesseph thinks Berkeley’s position is ‘a variety of game formalism’. Formalism, as Jesseph defines it, is ‘the doctrine that the subject matter of mathematics is the mathematical symbols themselves and not some external realm of objects to which these symbols refer’ (my italics)\(^{35}\). And ‘game formalism’ sees mathematics as ‘a game of symbol-manipulation analogous to chess’, that is to say: ‘arithmetic is a game of signs which is called empty, by which is meant that they have no other content (in the calculating game) than that which they are assigned in relation to their behaviour under certain combination rules (rules of the game)’ (my italics)\(^ {36}\).

Accordingly, Jesseph summarizes Berkeley’s position as a game formalist: ‘on Berkeley’s view, arithmetic is a “purely nominal” science concerned with the manipulation of symbols, although we

\(^{35}\) Jesseph, op. cit., p.106.

\(^{36}\) Ibid., p.107.
can apply this purely symbolic reasoning to the world by interpreting the formalism to represent collections of objects; and that ‘the truths of arithmetic concern only what combinations of symbols are constructible by using the rules, and are essentially true by definition’.

While Jesseph’s account of Berkeley’s view of arithmetic in the light of the later history of mathematics is quite instructive, I have some reservations. Jesseph acknowledges that ascription of formalism to Berkeley takes risk of anachronism. But I think characterization of Berkeley’s position as a game formalist does not sit well with his central insight that arithmetic is essentially practice-oriented. If the chief motivation of formalism was to exempt mathematicians from worries about the problem of reference, i.e. worries about correspondence between the symbolic systems and the world (sensible or abstract) external to the symbolic systems, then can we take Berkeley as approving of mathematicians pursuing such a plan? Let us look at section 122 again: ‘those things which pass for abstract truths and theorems concerning numbers, are, in reality, conversant about no object distinct from particular numerable things, except only names and characters; which originally came to be considered, on no other account but their being signs, or capable to represent aptly, whatever particular things men had need to compute’ (my italics). Berkeley rejected the abstractionist arithmetic which indulges in the self-contained world of abstract entities. However, he would equally oppose the ‘game formalism’ which sees arithmetic as the self-contained symbolic games which can stand without reference to sensible particulars. It is very likely that Berkeley would regard the formalist arithmetic as just another instance of ‘so many difficiles nugae’ which are ‘not subservient to practice, and promote the benefit of life’ (PHK.119)

If we take to heart Berkeley’s insistence in section 122 that in arithmetic signs ‘are not regarded for their own sake, but because they direct us how to act with relation to things’, it seems to me that he conceived the relationship between the truths of arithmetical reasoning and the sensible world

37 Ibid., pp.112-3
more strongly than the formalism defined by Jesseph does. To be sure, Jesseph never disregarded ‘the primacy of practice over theory’ in Berkeley’s philosophy of arithmetic. But does this practical orientation fit very well with the view of arithmetic as ‘a “purely nominal” science’, as Jesseph ascribes it to Berkeley, and with the conception of arithmetical truths as solely concerned with manipulation of symbols in accordance with definitions and the stipulated rules? In order to go further in clarification of Berkeley’s conception of arithmetical truths and its connection with his pragmatic view of arithmetic, it will be convenient to start by looking at the passage of section 121.

... the number of any particular things is said to be known, when we know the name or figures (with their due arrangement) that according to the standing analogy belong to them. For these signs being known, we can by the operations of arithmetic, know the signs of any part of the particular sums signified by them; and thus computing in signs (because of the connexion established betwixt them and the distinct multitudes of things, whereof one is taken for an unit), we may be able rightly to sum up, divide, and proportion the things themselves that we intend to number. (PHK. 121)

Here Berkeley explains what it is to know numbers. We should note three points in it. We should note, first, that according to Berkeley to know number is to know the number of particular things or ideas. This means that our knowledge of number is always anchored in the practice of counting things. Second, this knowledge of number is attained by means of names and figures. In the science of arithmetic, we do not count things directly but use artificial symbols as the immediate object of computation. Third, the manipulation of artificial symbols leads to knowledge of number, i.e. knowledge of the number of particular sensible things, because of the standing analogy between names and figures on the one hand and particular things on the other.

Now this concept of ‘analogy’ is very important to Berkeley’s philosophy of arithmetic; and
indeed, it is important to his account of scientific knowledge *in general*. If we interpret his discussion of the nature of arithmetic by taking account of the role of ‘analogy’ in it, we will see how he considered arithmetic to be more than a ‘purely nominal’ science, conceiving arithmetical truths as consisting in *correspondence* of the symbolic system with the extra-symbolic world of particular things. While Jesseph sees in the passage of section 121 a support for his interpretation of Berkeley as a ‘formalist’, I think it suggests another line of interpretation. Here we should be careful about the difference between Berkeley’s positions in the notebooks and in the *Principles*. As I briefly discussed earlier, he argued in the notebooks: ‘The great use of the Indian figures above the Roman shews Arithmetic to be about Signs not Ideas’ (PC.803). In section 121 of the *Principles*, he again clarifies the nature of arithmetic by tracing the development of notation from primitive tokens to the Arabic-Indian numerals, but this time he never says arithmetic is ‘about signs’. Instead, his attention is clearly directed to the *representing capacity* of signs: ‘by the repetition of a few characters or figures, and varying the signification of each figure according to the place it obtains, all numbers may be *most aptly expressed*’ (my italics). This way of talking about the expression of numeral symbols shows that in the *Principles* Berkeley no longer conceives arithmetic only in terms of a symbolic game defined by rules. And what numeral signs more or less ‘aptly express’ are the *relations* of particular sensible things. Arithmetic is concerned with signs and the manipulation of them only insofar as they express the *relations* of particular things by analogy.

Thus, while Jesseph thinks Berkeley’s view does not significantly differ between the notebooks and the *Principles*, I think it does. To know number is to know the *number* of particular things, but this is, to put it precisely, to know their *relations* by the assignment of number to them in accordance with the choice of a particular sensible unit. Since the object of arithmetic is not signs

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38 He sees in the account in section 121 ‘obvious affinities with formalism’. See Jesseph, op. cit., p.110. But here Berkeley never talks about the derivation of arithmetical formulas from the axioms and definitions, which Berkeley, if he was the formalist as defined by Jesseph, would do.

but the number-relations of things which signs ‘express’ by analogy, Berkeley can now explain why we can attain to the same truth by the use of different symbolic systems. Whether we count things by the names of ordinary language or by the Arabic-Indian numerals, the result of computation will be the same insofar as names and figures are designed to express the relations of particular things by the same analogical method. As Berkeley observes, the Arabic-Indian numerals are contrived

... in imitation of language, so that an exact analogy is observed betwixt the notation by figures and names, the nine simple figures answering the nine first numeral names and places in the former, corresponding to denominations in the latter. And agreeably to those conditions of the simple and local value of figures, were contrived methods of finding from the given figures or marks of the parts, what figures and how placed, are proper to denote the whole, or vice versa. (PHK.121)

To compute the number of particular things, we may use whatever media which express the same relational structure by analogy and thereby reach the same result. The object of arithmetic, then, is not signs as such but signs as representing a certain relational structure which ultimately refers back to the relations of particular things. Number consists in the relations of particular things, and we know them by means of symbols which express them. The chief concern of arithmetic as the art of counting is to improve the way we know the relations of things by finding out the ‘apt’ method to express them, i.e. by contrivance of signs which are easy to manipulate, as well as by invention of the simplest general rules of notation and computation to be applied to them. The best example of such method is the Arabic-Indian numeral system with general rules of their operations, by which we are able to perform computations in the clearest and most efficient manner.

This interpretation of Berkeley’s view of arithmetic – which, if a label is necessary, may be called ‘symbolic structuralism’ – is not anachronistic. Indeed, the view of arithmetic as symbolic
reasoning about relations of things can be found among his contemporary philosophers. The best representative of symbolic structuralism, Leibniz, gives us the core insight of the view in his early paper titled ‘A Dialogue’. There Leibniz argues against radical nominalism about *truths* (implicitly referring to Hobbes), according to which all truths are considered ‘arbitrary’ since they depend on definitions about signs or characters, which are men’s arbitrary institution. In reply to this, Leibniz observes that though signs or characters we use in thought and reasoning are arbitrary, *the relations expressed by their combinations* should be the same in the use of different symbolic systems:

... if characters can be applied to reasoning, there must be some complex arrangement, some order which agrees with things, .... ... though the characters are arbitrary, their use and connection have something that is not arbitrary, namely, a certain correspondence [*proportio*] between characters and things, and certain relations among different characters expressing the same things. And this correspondence or this relation is the ground of truth. For it brings about that whether we use these characters or others, the same thing always results, or at least something equivalent, that is, something corresponding to proportion always results.⁴⁰

This is a general observation about symbolic reasoning, but Leibniz uses arithmetic for illustration of this point. In arithmetical calculation, we always obtain the same results through different systems of notation, whether we use the decimal or duodecimal systems. This is because *the same order* is preserved in the use of those different systems. Thus, conceding to nominalism on the point that all truths presuppose the use of arbitrarily chosen symbols, Leibniz points out that ‘truths don’t consist in what is arbitrary in the characters, but in what is invariant in them, namely, in the relation

⁴⁰ G.W. Leibniz, *Philosophical Essays*, edited and translated by Roger Ariew and Daniel Garber, Hackett Publishing Company, 1989, p.271. I am not saying that Berkeley was directly influenced by Leibniz, but quoted Leibniz just as a representative of his contemporary mathematicians.
they have to things'. When Berkeley talks about the 'exact analogy observed' between the Arabic-Indian notation and ordinary numeral names, and about the 'connection established' between 'signs' and 'the distinct multitudes of things, whereof one is taken for an unit', he can be reasonably taken as getting at the same point that Leibniz explains in the above passage. Then it would be misleading to ascribe to Berkeley the view that arithmetic is a 'purely nominal' science. For he thinks, with Leibniz, that arithmetic is concerned not with numeral figures and names but with the relations of things which are expressed by figures and names. Number is distinct from symbols, but it is apprehended through symbolic expressions, and the truth of arithmetic consists in the correspondence between the relational structure they embody and the relations of the things they represent. Berkeley’s position in the Principles is thus clearly different from his notebook position which straightforwardly identifies numbers with names and figures.

My interpretation of sections 121-2 of the Principles conforms well to the central thesis of Berkeley’s philosophy of arithmetic that ‘the science of numbers is [entirely] subordinate to practice’ (PHK.120). Taking into account his emphasis on the practical usefulness of arithmetic, it is clear that the radical nominalism he endorsed in the notebooks is untenable. For, without the third kind elements which remains the same and constant between numerals and the things numbered, the results which obtain in symbolic calculation would not be translatable to the things conserving the truth; and consequently, numeral symbols would not be assigned any practical utility. To say that knowledge of number is just concerned with ‘signs’, which are mere figures and names, is to take away all practical significance from arithmetic. Berkeley’s pragmatic approach to arithmetic clearly entails the falsity of pure nominalism which simply identifies numbers with symbols. His actual view is that numbers are the objects of knowledge distinguishable from symbols, that is, certain features of particular sensible things. To put it exactly, these features are the objective relations of particular things which numerical symbols represent. However, while this interpretation
may be reasonably ascribed to Berkeley on the basis of his discussion in sections 121-2, it is true that he never explicitly acknowledges that arithmetic has a third kind object to deal with besides symbols and particular sensible things. Indeed, there was a worry that the ‘relations’ commonly shared by signs and things looked like the abstract objects he tried to exclude from the science of number. Consequently, philosophy of arithmetic in the Principles appears to be pointing to a more extreme form of nominalism than it actually is.

The apparent obstacle to the interpretation of Berkeley along the Leibnizian suggestion that numbers are not arbitrary but invariable features of things is his claim in section 12 that number is ‘the creature of the mind’. This looks like an uncompromisingly subjectivist view of number. But I believe his considered position is less radical than it seems initially suggested by section 12. Indeed, his view of number as the mind’s creature is quite compatible with the recognition that numbers are the objective, invariable relations of things. In order to see this, let us re-examine his argument in section 12. There he argued that number is ‘the creature of the mind’ from the relativity of our ‘denomination’ of things like books or extension. His argument is grounded on the arbitrary choice of unit: the ‘denomination’ of the same thing varies in accordance with the arbitrary decision we make about what particular feature of the thing is to be chosen as a unit. But this point does not necessarily lead to the conclusion that the number thus assigned to things has no objective ground in the thing itself. In our choice of ‘unit’, we pick out something, such as a book or a page, among the regular features we find in things and count it as ‘one’. Now, it is indeed up to us which one of the regular features of things is to be taken as ‘unit’, and the name of number we assign to things accordingly depends on our decision. Acknowledging such variability in the denomination of things, however, it is still possible to hold that there is something invariable through different denominations by different choice of unit: the relation of one thing to others in terms of the chosen unit, however arbitrarily we may choose it, remains the same insofar as the unit we choose is part of
the regular feature of things which we do not create. To use Berkeley’s example, the same extension may be denominated one or three or thirty six in terms of yard or foot or inch, but we reach the same result by whichever denomination we calculate (supposing that we consistently use the same system of unit in calculation). We naturally prefer to count smaller things by inch and larger things by yard for convenience. But whether we count it by inch or by yard, the computation about the proportion, say, between the pen and the desk will have the same result. This is because an idea of extension contains invariable regular feature which we cannot arbitrarily create or eliminate. It is by virtue of such invariable regular feature contained in the idea of extension that different denominations applied to the same extension express the same relation, and that the same truth is always conserved in the calculating and comparing about the extension.

Berkeley’s apparently radical conclusion in section 12 that number is ‘the creature of the mind’ is actually not opposed to the view that number is the objective features (i.e. the relations) of things. The standard interpretation of Berkeley as a thoroughgoing subjectivist about numbers appears plausible only because his argument in section 12 is highlighted in isolation from his account of arithmetical computation in section 121. As long as he concentrates on the context of ‘denomination’, Berkeley appears to point towards detaching number from the objective realm of things and reducing it to mere ‘names’. But when he comes to consider number in the context of reasoning about it, he can no longer be content with the identification of number with names. Here the consideration of practical utility comes to the fore, and number is considered the extra-symbolic object apprehended through the representational capacity of numerical symbols. As he noted in section 122, arithmetic is directly concerned with ‘signs’, but this is because they are ‘not regarded for their own sake, but because they direct us how to act with relation to things, and dispose rightly of them’. It is all right that what denomination we assign to things and what system of notation we adopt in arithmetical computation entirely depend on our free choice; but the validity of reasoning
about number which is performed on the symbolic system, and the applicability of the reasoning to
the world of things, cannot be equally arbitrary and up to us. As Leibniz suggested, these two points
are reconcilable, and the acceptance of the first point does not entail the denial of the latter.
Although Berkeley does not explicitly discuss the relationship between sections 12 and 121, we can
reasonably interpret him as endorsing the view that they are mutually compatible. As I have argued,
in light of section 121, Berkeley cannot be taken as a champion of radical nominalism which insists
on the arbitrariness not only of symbolic institution but also of the truth of symbolic reasoning.
Chapter 4
Symbolic substitution and scientific knowledge of nature

In this chapter, I explore the motif of symbolic substitution in Berkeley’s theory of scientific knowledge in the middle-period works, Alciphron and De Motu, and also consider the connection of this motif with his theory of knowledge in the last stage in Siris.

In section 1, I discuss Berkeley’s account of the nature of scientific knowledge in Alciphron which is developed in his presentation of ‘the doctrine of signs’. The chief concern in this section is clarification of the concept of symbolic substitution which is central to the understanding of his account of science in the middle period. In the first part, I start by following Berkeley’s argument against Locke’s account of language, according to which the meaningful use of language involves communication of ideas. By reference to his example of ‘grace’ and ‘force’, I will formulate his alternative account of meaningfulness, which highlights the use of language for pragmatic purposes. I will point out a complexity in his comparison of ‘grace’ and ‘force’, and clarify Berkeley’s account of the use of these terms. In the second part, I explain the concept of ‘symbolic substitution’ which I take to be the core insight of ‘the doctrine of signs’ in Alciphron. I will argue that Berkeley’s discussion of the use of signs in Alciphron shows a significant development from his view of language in the Principles. My point is that in Alciphron, unlike in the Principles, Berkeley no longer subscribes to the view that linguistic practice presupposes the ideational backup as the ultimate ground of meaningfulness. What underlies this development, I suggest, is the enlarged perspective in which the theory of ‘words’ is subsumed under the general theory of ‘signs’. From this standpoint, Berkeley puts forward the concept of ‘symbolic substitution’. The remarkable point about his ‘doctrine of signs’ in Alciphron is that he positively appraises the dynamic potential of
symbolic thought: the use of signs can create new contents of thought. This shows a clear departure from the intuitionist view of knowledge he endorsed in the early period.

In section 2, I will clarify how Berkeley's 'doctrine of signs' in *Alciphron* and his introduction of 'knowledge of relations' in the second edition of the *Principles* is linked together. It will be observed, firstly, by reference to the passages in the third edition of *Alciphron*, that Berkeley holds that knowledge of relations depends on the use of artificial signs. Thus 'relations' as the third distinct object of knowledge is clearly to be interpreted in light of the motif of 'symbolic substitution' in the middle-period theory of knowledge. I will clarify this link by consideration of the coordination of the practical and theoretical spheres in Berkeley's conception of scientific knowledge. For Berkeley, symbolic thought in science consists not only in their practical function of regulating actions but also in its function as the groundwork for further theoretical progress. Thus 'knowledge of relations' is conceived as the ability of using symbols which express relations in the coordinating dimension of theoretical understanding and practical applications.

In section 3, I explore Berkeley's mature philosophy of natural science in *De Motu* which I take as representing the most refined elaboration of his view of Newton's mechanics as 'the best grammar of nature'. We saw in section 3 of chapter 3 that in the *Principles* he interpreted Newton's concept of 'attraction' from the phenomenalist standpoint, taking the law of gravitation as inductive generalization from observable similarities of phenomena. But in *De Motu* he conceives the nature of Newton's mechanics in quite a different way and takes positive attitude to the use of 'hypothesis'. In the first part, I discuss Berkeley's view that dynamical concepts are 'mathematical hypotheses' by comparison with Newton's distinction of 'mathematical' and 'physical' explanation. Newton made this distinction in opposition to Cartesian physics which employs 'hypotheses' for physical explanation of gravity. I will observe that Berkeley does not intend to follow Newton in his concept of 'mathematical hypothesis', but that he exploits Newton's differentiation of 'mathematical' from
‘physical’ with respect to the concept of attraction in favour of his point that dynamical terms (‘force’ and ‘gravity’) have no reference to physical cause. In the second part, I explore some positive implications about the nature of mechanics in Berkeley’s strict demarcation of mechanics from metaphysics. In his repudiation of hypothesizing about physical causes, Newton did not abandon causal explanation in his ‘experimental philosophy’. Berkeley denies that the study of ‘true cause’ belongs to natural philosophy, but he acknowledges that mechanics are concerned with ‘causal explanation’ in a certain sense. In clarification of this point, I will suggest that for Berkeley in *De Motu* the laws of motion are the premises of the hypothetico-deductive system of mechanics, and that explanation of phenomena by these laws involves the understanding of the true structure which underlies observable phenomena. I will conclude by addressing myself to the question about ascription of ‘instrumentalism’ to Berkeley’s account of mechanics in *De Motu*.

In section 4, I will connect the middle-period development of Berkeley’s theory of knowledge we have seen so far to his view of ‘the scale of knowledge’ presented in his last major work, *Siris*. The conspicuous feature of Berkeley’s theory of knowledge in *Siris* (which is developed by frequent reference to the view of Plato and Neo-Platonists) is its emphasis on the hierarchical order of knowledge and cognitive faculties. Without getting into his theory of ‘intellect’, I will here focus on the strict distinction between ‘sense’ and ‘understanding’ in this work. In *Siris*, Berkeley clearly departs from his position in the *Principles* by clean separation of the faculty of ‘understanding’ from sense perception, restricting the capacity of knowledge to ‘the understanding’. But I will observe that this restrictive conception of the ‘understanding’ as distinct from sense was derived from the development of his theory of knowledge in the middle period. In *Siris*, Berkeley regards the understanding as the faculty of scientific knowledge for the reason that knowledge involves *activity*, and this can be interpreted in light of his view of science in the middle period that it is knowledge of relations by ‘symbolic substitution’. There is clear textual evidence which supports
the interpretation that the view of 'understanding' in *Siris* is in close connection with his view of science as 'the grammar' of the language of nature. The view that knowledge is activity and distinct from passive perception, becomes intelligible if we take into consideration his middle-period view about the nature of scientific knowledge.

1. The ‘doctrine of signs’ and the nature of scientific knowledge in *Alciphron*

(1) ‘Force’ and ‘grace’: two modes of the action-oriented use of language

My concern in this section is to explore Berkeley’s account of the nature of scientific knowledge in the seventh dialogue of *Alciphron*, which is developed from the general viewpoint about the use of ‘signs’ in human thoughts and activities. The ‘signs’ whose nature is made the subject of consideration in this dialogue are *artificial signs*, i.e. conventional signs such as ordinary language and those used for specific purposes in the particular contexts of thoughts and activities. Particularly noteworthy about his account of science in *Alciphron* is recognition of the *heuristic* role of signs in scientific progress: signs are indispensable to science not just for *recording* and *utilizing* the acquired knowledge but for *creating* and *further expanding* knowledge as well. Such recognition of the active inventive nature of scientific knowledge and the essential contribution of artificial signs to the formation of science constitutes a novel point of Berkeley’s middle-period thought which is not present in the *Principles* and the *Three Dialogues*. Berkeley’s appreciation of the significance of symbolic thought in the middle period stems from his reflection on the use of signs in a wide range of the fields, not confined to intellectual, of human activities – in the *Querist*, published three years after *Alciphron*, Berkeley applies his ‘doctrine of signs’ to the analyses of money and the nature of wealth. In the latter half of this section, I will explore how Berkeley’s ‘doctrine of signs’ in *Alciphron* exhibits a new development in comparison with his view of language in the *Principles*. 

198
This point will be further pursued in section 2, where I will clarify the relationship between Berkeley’s recognition of the significance of symbolic thought in *Alciphron* and his introduction of ‘knowledge of relations’ in the second edition of the *Principles*.

Another remarkable point about his treatment of science in *Alciphron*, which will be important in connection with our discussion in section 3 on Berkeley’s reconstrual of Newton’s mechanics in *De Motu*, is that in the seventh dialogue he is trying to clarify the role of the concept of ‘force’ in mechanical science. Since the overall theme of *Alciphron* is vindication of Christian faith, Berkeley’s treatment of ‘force’ in this work is embedded in the apologetic context in which he is chiefly concerned to establish the parity between religion and science. In the seventh dialogue, Alciphron, a figure representing the cause of free-thinking, argues that Christian faith is impossible because the articles of faith contain meaningless words (especially such terms of mystery as ‘grace’, ‘trinity’, ‘original sin’, etc.). Euphranor, Berkeley’s spokesman, defends the legitimacy of religious language by comparison of its function in the formation of faith with the function of scientific language in the formation of scientific knowledge. In this context, he compares the religious term ‘grace’ with the scientific term ‘force’, arguing that the one can be used as meaningfully in discourse as the other. Since Euphranor here tries to show the parity between ‘force’ and ‘grace’ in terms of the general doctrine of symbols, his discussion can be read as a clarification of the status of dynamical concepts from the standpoint of his middle-period thought about the use of ‘signs’ in human thoughts and activities. In this section, I will follow Berkeley’s argument against Locke’s doctrine of meaningfulness in the seventh dialogue and articulate, by reference to his example of ‘grace’ and ‘force’, his alternative account to it. This will serve as a preliminary discussion before turning to Berkeley’s critique of Newton’s mechanics in *De Motu* in section 3.

Berkeley’s talk about ‘the doctrine of signs’ in *Alciphron* most probably derives from Locke who in the last chapter of the *Essay* refers to it as constituting one of the three great divisions of
science. The ‘doctrine of signs’, as Locke defines it, is a ‘logic and critique’ whose task is ‘to consider the nature of signs the mind makes use of for the understanding of things, or conveying its knowledge to others’. It is a meta-science about ‘the great instruments of knowledge’, i.e. ‘signs’, studying the function of signs in the formation of knowledge regardless of the varieties of subject of discourse. The term ‘doctrine of signs’, as Locke’s juxtaposition of it with the Greek word σημειοτική suggests, signifies the teachings about the ‘art (technē) of signs’. Berkeley follows Locke’s conception of ‘the doctrine of signs’ insofar as it is defined as the general study of ‘the art of signs’. However, his ‘doctrine of signs’ goes beyond Locke’s in several important respects. Firstly, whereas Locke mentioned the importance of the doctrine of signs only in connection with understanding and knowledge, Berkeley has a greater scope of human activities in view, not only intellectual but practical, to be illuminated by it. The second point of disagreement is closely related to the broader perspective Berkeley has with respect to the study of signs. The point of disagreement is concerning the semantic view which underlies Locke’s doctrine of signs. It was through confrontation with consequences of Locke’s criterion of meaningfulness in the realm of religion that Berkeley was prompted to work out an alternative account — the account of meaningfulness which equally makes sense of science and religion.

The refutation of Locke’s criterion of meaningfulness makes an essential part in Berkeley’s presentation of ‘the doctrine of signs’ in Alciphron. We are now going to look at how it is advanced by him by close comparison of ‘grace’ and ‘force’. The chief point of dispute in the exchange between Alciphron and Euphranor in the seventh dialogue concerns whether religious language is justifiably considered meaningless in comparison with scientific language. In order to conclude in

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41 Essay, Book IV, chapter 21, section 4.
the affirmative about this, Alciphron relies on the Lockean criterion according to which the meaningful use of words should involve communication of ideas between the speaker and the hearer: 'Words … do or should stand for ideas, which so far as they suggest they are significant. But words that suggest no ideas are insignificant. He who annexeth a clear idea to every word he makes use of speaks sense; but where such ideas are wanting, the speaker utters nonsense' (Alc.VII-2). Accordingly, the essential requirement for every meaningful discourse, from everyday conversation to scientific and religious dissertations, is that the speaker attaches 'a clear and distinct idea' to every word he uses and that the hearer perceives 'the same train of ideas' suggested to the mind while hearing (Ibid.). We may paraphrase this claim of Alciphron to the statement that the meaningful use of language ('words' and 'propositions') should always be information-oriented. And the information-oriented use—or, for brevity, the informative use—is the use of language by means of which the speaker intends that the hearer perceives all the ideas he attaches to the words he utters (and the propositions which is composed of them) in his speech. In a nutshell, Alciphron stipulates that a discourse is meaningful if and only if it does not contain a word of which either the speaker or the hearer is incapable of forming the corresponding ideas.

Now Alciphron is confident that while science meets this requirement, religion falls short of it. To illustrate this point, he takes up 'grace' as a paradigmatic instance of meaningless words which

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43 The official statement of this thesis by Locke is found in the Essay, Book III, chapter 2, section 2: 'The use men have of [words] being either to record their own thoughts for the assistance of their own memory or, as it were, to bring out their ideas and lay them before the view of others: words, in their primary or immediate signification, stand for nothing but the ideas in the mind of him that uses them … When a man speaks to another, it is that he may be understood; and the end of speech is that those sounds, as marks, may make known his ideas to the hearer'. But in fact Locke does not rigorously subscribe to this general thesis and makes exceptions, observing that syncategorematic terms (which he calls 'particles') such as 'is', 'not', 'and', 'but', 'if', etc., signify not 'ideas' but 'some action or intimation of the mind' (Essay, Book III, chapter 7, section 1-4). Yet it is still the case that Locke thinks every cateogorematic term (nouns, adjectives, and verbs) signify (and ought to signify, if we intend to have meaningful conversation) 'ideas in the mind of him that uses them'. And Berkeley's discussion of meaningfulness in Alciphron is concerned with cateogorematic terms.
fill up religious discourse. The 'doctrine of grace' is central to Christian faith, but he observes that men actually cannot have faith in divine grace because there is no idea corresponding to the word 'grace'. Faith and knowledge, Alciphron argues, involves 'assent', but 'all degrees of assent ... terminate in ideas as their proper object; without which there can be no such thing as knowledge, faith, or opinion' (Alc.VII-3). Thus, since there is no idea corresponding to the word 'grace', we cannot assent to any proposition containing it. Hence there can be no faith about the doctrine of grace. On the other hand, in the realm of science there is no such problem parallel to the case of 'grace'. At this point he compares 'grace' with the scientific term 'force', suggesting that in truth any feeling of having a clear idea of 'grace' derives from the fact that grace, considered as 'something that acts, moves, and determines', is taken to be analogous to 'force' which applies to bodies. But this is only a delusion, for 'though the idea of corporeal force be ever so clear and intelligible, it is not therefore follow that the idea of grace, a thing perfectly incorporeal, must be so too. And though we may reason distinctly, perceive, assent, and form opinions about the one, it will by no means follow that we can do so of the other' (Alc.VII-4). There is no doubt, then, that we understand scientific propositions containing the term 'force' and attain knowledge about force; whereas all the propositions containing the term 'grace' is meaningless and lead us to no faith.

Euphranor's— that is, Berkeley's— strategy in response to this line of attack on religious language is to show the absurd consequence of the Lockean criterion and thereby opens up a new perspective on the meaningful use of language. His main point is that the Lockean criterion is too restricted that it excludes not only religion from among the legitimate subjects of discourse but science as well which free-thinkers regard as the paradigm of meaningful discourse. In order to

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44 In the first and second edition, Euphranor's argument against the Lockean criterion was lengthier because it had everyday conversation as well in view. In the three sections (5-7) which were omitted in the third edition, Euphranor argued to the effect that if Locke was right, even ordinary talks, containing such words as 'man', 'triangle', 'colour', should be judged meaningless. In this context Berkeley rehearsed the argument against 'abstract general ideas' which had been earlier
establish this point. Berkeley calls for the support of his argument against abstract ideas which was
developed earlier in the Introduction to the Principles. For Alciphron, the word ‘grace’ (as well as
other terms of religious mystery) is meaningless simply because he can find no ‘idea’ suggested to
the mind upon hearing it. Euphranor allows this to be the case, but he points out that by the same
criterion mathematics and physics should prove to be no better than religion: the terms ‘number’
and ‘force’ actually have no corresponding ‘ideas’, and hence should be meaningless. Alciphron
supposes (again with Locke) that ‘number’ and ‘force’ stand for certain ‘abstract ideas’ suggested to
the mind (of scientists, at least), and that scientific knowledge is derived from contemplation of
such abstract ideas. But Euphranor argues that this is groundless. There are in fact no such abstract
ideas corresponding to the terms ‘number’ and ‘force’. ‘Do but try now’, Euphranor challenged
Alciphron, ‘whether you can frame an idea of number in abstract, exclusive of all signs, words, and
things numbered. I profess for my own part I cannot’ (Alc.VII-5). Likewise, it is impossible to
‘exclude the consideration of its subject [i.e. a body] and effects [i.e. motions], and contemplate
force itself in its own precise idea’ (Alc.VII-6). Thus, if there are no abstract ideas of number and
force, it should follow that ‘number’ and ‘force’ are meaningless words, and furthermore, by
Alciphron’s account of the nature of knowledge seen in the above, that we cannot have any
knowledge or opinion about number and force.

Now, before looking at Berkeley’s alternative account of meaningfulness, we need here to note
the complexity involved in his refutation of the Lockean criterion. Euphranor’s procedure of
showing how Locke’s criterion of meaningfulness should go wrong may appear to rest crucially on
developed in the Introduction to the Principles. Since the general word ‘man’ suggests no ‘idea of
man’, whether abstract general one or particular one, when we utter it or hear it in ordinary
conversation, it follows, according to the Lockean criterion of meaningfulness, that all ordinary
discourse containing ‘man’ should be meaningless. The omission of the three sections in the third
edition need not be interpreted (as it was by A.C. Fraser) as an indication of the retraction of his
earlier critique of abstractionism. Rather, the omission was intended to sharpen the main point that
religious language and scientific language are on a par with regard to meaningfulness.
the point that there is in fact no abstract general idea suggested by the terms, ‘number’ and ‘force’, which are general words. The import of his argument, then, seems to be that Locke’s criterion of meaningfulness should invalidate scientific as well as religious language because it is combined with a wrong (again Lockean) account of general words. But this way of refuting the Lockean criterion is precarious. Alciphron or whoever wants to maintain the validity of the Lockean criterion might abandon the view that general words suggest one abstract general idea to the speaker’s and the hearer’s mind, taking instead the alternative position that they suggest one of the particular ideas of a certain sort—a general numeral word, ‘one’, for instance, suggest one apple or one tree to the mind which is a particular instance of the general idea of the number one. This move would save the Lockean criterion of meaningfulness and thus enables Alciphron to say that religious language is not on a par with the general name of number—that no particular idea is suggested by the general word ‘grace’ since there is no particular instance of grace in the sensible world.

Furthermore, supposing that Alciphron does not abandon the view that general words suggest one abstract general idea, it still seems that Euphranor’s argument against the existence of such idea is very weak: the simple method of ‘try and see’ by introspection of one’s own mind is far from compelling to decide whether one really has ‘an idea of number in abstract’.

However, Berkeley’s refutation of Locke’s criterion of meaningfulness does not rest solely on the point that there is no abstract general idea corresponding to a general word. The terms which are compared by Alciphron and Euphranor, ‘grace’ and ‘force’, are, to be sure, general words. But

45 This is not Berkeley’s position, as we saw in section 4 of the previous chapter. And this point is not restricted to the idea of ‘number’, applying to other general words such as ‘man’. In section 7 of the first/second edition, there is an exchange between Alciphron and Euphranor as follows: ‘ALCIPHRON: It is your opinion, then, that words become general by representing an indefinite number of particular ideas. … Whenever, therefore, I hear a general name, it must be supposed to excite some one or other particular idea of that species in my mind? EUPHRANOR: I cannot say so neither. Pray, Alciphron, doth it seem to you necessary that as often as the word man occurs in reading or discourse, you must form in your mind the idea of a particular man? ALCIPHRON: I own it doth not’.
the reason we have difficulty in formation of ‘clear and distinct’ ideas corresponding to them is actually not that they are general words. The case of ‘force’ is more complex than that of ‘number’, since the term ‘force’ is not only general but is supposed to refer to the cause which is distinct from perceivable ideas. There is no doubt that Berkeley deliberately pairs ‘grace’ with ‘force’ because they are considered to be kinds of causal power which are responsible for the occurrences of events in the world but are distinct from those events: while ‘force’ is the cause of physical motions (according to ‘the doctrine of force’), ‘grace’ is the cause of human moral actions (according to ‘the doctrine of grace’). That Berkeley consciously exploits such parallel between ‘force’ and ‘grace’ is apparent in the way he sets up the parity of the case between these two terms. Thus, Alciphron complains that he cannot ‘frame any distinct idea’ of grace, ‘when it denotes an active, vital ruling principle, influencing and operating on the mind of man, distinct from every natural power or motive’; and that the idea of grace and that of force cannot be taken as equally clear merely because they are conceived as ‘something that acts, moves, and determines’. Euphranor’s rejoinder to this complaint is to challenge Alciphron to form a distinct idea of ‘force abstracted from body, motion, and outward sensible effects’ (Alc.VII-6). While Alciphron takes it for granted that the idea of ‘corporeal force’ is much easier to conceive than that of grace which is ‘incorporeal’, Euphranor points out that they should be equally obscure inasmuch as ‘force’ and ‘grace’ are taken to refer to the imperceptible cause distinguished from observable effects. The central point of the parity consideration is not whether there are general ideas corresponding to the terms ‘force’ and ‘grace’ which are abstracted from particular instances of force and grace; but whether there are ‘ideas’ of force and grace which are abstracted from the perceptible motions and actions.

The point that Berkeley intends to compare the concept of force and that of grace in terms of abstraction from sensible effects rather than in terms of abstraction from particularity is important. The appreciation of this point will help us have a clearer understanding of what account of
meaningfulness Berkeley is putting forward in place of the Lockean one for his own ‘doctrine of
signs’. We will start by exploring the implication of the ‘counter’ model Berkeley uses to overturn
the Lockean criterion. In order to open up a new perspective on the meaningful use of words,
Euphranor proposes extending the horizon of consideration from words to ‘signs’ and introduces
‘counter’ as an instructive model⁴⁶. The counters on card tables stand for money, but it is obviously
not true that they cannot function as ‘signs’ unless they are used with money beside them. In order
for counters to function as signs of money, Euphranor observes, ‘it is sufficient the players at first
agree on their respective values, and at last substitute those values in their stead’ (Alc.VII-5). Of
course, card players utilize counters because they stand for money, but during the games the players
disregard the money for which the counters are to be cashed out at the end of the game and are
concerned solely with the manipulation of the counters. Thus by the same analogy, we may
meaningfully use ‘words’ as signs of ideas, ‘although they should not, every time they are used,
excite the ideas they signify in our minds; it being sufficient that we have it in our power to
substitute things or ideas for their signs when there is occasion’ (Ibid.).

Now, since Berkeley introduces the ‘counter’ model before getting into discussion of the use of
scientific and religious terms, ‘force’ and ‘grace’, the moral he draws from consideration of the use
of ‘counter’ should be relevant to clarification of the meaningful use of those terms. The first moral,
as we have just seen, is that words are meaningful without the ideas they stand for being suggested
to the mind every time they are used. The second moral which he goes on to draw is that

there may be another use of words besides that of marking and suggesting distinct ideas, to wit,

⁴⁶ This procedure of turning back to the simplest model of language to show the inadequacy of the
accepted theory of language is somewhat reminiscent of the opening passages of Wittgenstein’s
Philosophical Investigations. Antony Flew suggested that Berkeley might have anticipated
Wittgenstein in his discussion on the Dialogue VII of Alciphron, though he never went further to
develop the comparison in detail. See Antony Flew, ‘Was Berkeley a precursor of Wittgenstein?’,

206
influencing our conduct and actions, which may be done either by forming rules for us to act by, or by raising passions, dispositions, and emotions in our minds. A discourse, therefore, that directs how to act or excites to the doing or forbearance of an action may, it seems, be useful and significant, although the words whereof it is composed should not bring each a distinct idea into our minds. (Alc. VII-5)

As we saw before, according to the Lockean criterion, the meaningful use of words is always information-oriented, that is to say, the utterance of words should involve communication of ideas between the speaker and the hearer. In opposition to such restrictive position, Berkeley points out that it can also be action-oriented: words can be meaningfully used as well for the purpose of ‘influencing our conduct and actions’. As is stated in the above passage, under the head of this action-oriented (or, for brevity, pragmatic) use of words, Berkeley distinguishes two modes:

(1) The action-regulative use in which words are used to direct our actions by the stipulated ‘general rules’; and

(2) The emotive use in which words are used to influence (our own or other’s) actions by raising ‘passions, dispositions, and emotions’ in the mind.

The characteristic point of Berkeley’s ‘doctrine of signs’, which he puts forward as an alternative to Locke’s, consists in the particular emphasis on the pragmatic service for which words are used in human discourse. Whereas Alciphron, who wants to retain science by exclusion of religion, appeals to the Lockean criterion of meaningfulness which overestimates the cognitive/informative context of linguistic activity, Euphranor intends to validate religion and science by conceiving the function of words in both realms in terms of the pragmatic standpoint.

To turn to the parity consideration concerning ‘grace’ and ‘force’, we now see how Berkeley
thinks they are equally considered to be meaningful in terms of the pragmatic use of words. To consider the meaningfulness of ‘grace’ and ‘force’ equally from the pragmatic viewpoint does not mean that these words are used exactly the same way in religious and scientific discourses. The argument developed in sections 6-10 suggests that the two different modes of pragmatic use respectively characterize meaningful use of words in science and religion: the action-regulative use belongs to science and the emotive use to religion. Thus, for clarification of the meaningful use of the term ‘force’, Euphranor calls attention to ‘the parallelogram of force’. The parallelogram of force is the general rule used in Newton’s mechanics in the analysis of the forces applied to bodies. The representation and application of this rule by symbols, i.e. geometrical figures, help us discover the general laws and theorems of mechanics and thereby regulate our actions in the world:

Doth not the doctrine of the composition and resolution of forces depend upon [the principle of the parallelogram of force], and, in consequence thereof, numberless rules and theorems directing men how to act, and explaining phenomena throughout the Mechanics and mathematical philosophy? And if, by considering this doctrine of force, men arrive at the knowledge of many inventions in Mechanics … by means of which things difficult and otherwise impossible may be performed …; and if the same doctrine which is so beneficial here below serveth also as a key to discover the nature of the celestial motions; shall we deny that it is of use … because we have no distinct idea of force? (Alc.VII-7)

The term ‘force’ is used meaningfully in scientific discourse, then, when it is used in accordance with certain stipulated ‘general rules’. The parallelogram of force is one of those general rules, and the totality of such general rules constitutes ‘the doctrine of force’. The concept of ‘force’, therefore, is nothing more than the systematic body of interconnected general rules which defines the science of mechanics. The term ‘force’ (or the symbolic representation of ‘force’ in algebraic or geometrical
figures) is considered to have meaningful use in the formation of scientific knowledge inasmuch as the general rules concerning it has proven to be in agreement with sensible effects, regardless of the lack of ‘a distinct idea’ of force as the cause of those sensible effects. The chief concern in our use of the term ‘force’ is not to communicate ‘a clear and distinct idea’ of the cause of sensible effects – the possession of such an idea allegedly constitutes knowledge of the cause of physical motions – but rather the pragmatic direction of actions with regard to sensible things by ‘general rules’.

On the other hand, meaningful use of the religious term ‘grace’ is defined in terms of pragmatic service as well, but our chief concern in its use is not to help us formulate general rules or regulate actions by the formulated rules but rather to motivate moral actions.

... grace may, for aught you know, be an object of our faith, and influence our life and actions, as a principle destructive of evil habits and productive of good ones, although we cannot attain a distinct idea of it, separate or abstracted from God the author, from man the subject, and from virtue and piety as its effects. (ALC. VII-7)

As Euphranor goes on to observe in section 9, faith ‘is not an indolent perception, but an active operative persuasion of mind, which ever worketh some suitable action, disposition, or emotion in those who have it’ (Alc.VII-10). The term ‘grace’ is meaningfully used in religious discourse, then, when it serves to help people have faith taken in this sense of the ‘active operative persuasion’ productive of good actions (or destructive of evil actions). In the utterance of the propositions containing ‘grace’, it is not necessary that there occurs a communication of ‘a distinct idea’ of grace considered as the cause of moral actions or dispositions (virtues and piety) between the speaker and the hearer – this is indeed impossible since ‘the doctrine of grace’ belongs to a mystery. But those propositions are meaningful insofar as the speaker influences the hearer’s moral conduct by raising
'some suitable action, disposition, or emotion' in his mind. Alciphron argued that 'all degrees of
assent terminate in ideas as their proper object', and therefore that faith, which presupposes 'assent'
to a proposition, is impossible where there is no idea answering to a certain word in the proposition.
To this account of 'assent', Euphranor gives an alternative account: 'There is ... a practical faith, or
assent, which shews itself in the will and actions of a man, although his understanding may not be
furnished with those abstract, precise, distinct ideas' (Alc.VII-9).

(2) Symbolic substitution: the core concept of Berkeley's 'doctrine of signs'

Berkeley's observation on the pragmatic use of words in *Alciphron* is not entirely new. Earlier in
the *Introduction* to the *Principles*, he pointed out the use of words to which the Lockean criterion
about meaningfulness does not apply. In section 20 of the *Introduction*, he observed that besides
communication of ideas words have 'other ends, as the raising of some passion, the exciting to, or
deterring from an action, the putting the mind in some particular disposition'. This was the first
appearance of the emotive use of language in his published works, and in *Alciphron* he can be
taken as further developing this observation in defence of Christian faith. Furthermore, in the
same *Introduction* it was observed that 'in reading and discoursing, names [are] for the most part
used as letters are in algebra' (Pl.19). And later in the *Principles* in discussion of the nature of
arithmetic, he considered the use of language in sciences in terms of the manipulability by rules. As
we saw in the previous chapter, in sections 120-22 of the *Principles*, he defined the nature of
arithmetic to be symbolic computations of the number of things for the regulation of actions. He

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47 Berkeley considered application of his account of emotive use of language to the analysis of
moral and religious terms as early as in the *Manuscript Introduction*. Berkeley's *Manuscript
Introduction*, MI.39-43. For the standard exposition of Berkeley's account of emotive language in
the *Manuscript Introduction* and in *Alciphron*, together with his application of it to religious
apologetics, see David Berman, *George Berkeley: Idealism and the Man*, chapters 1 and 6.
concluded his discussion in section 122: ‘In arithmetic ... we regard not the things but the signs ... because they direct us how to act with relation to things, and dispose rightly of them’. It seems, then, that the two modes of the action-oriented use of language I have noted above, i.e. the action-regulative use and the emotive use, were both already present in the Principles.

However, this does not mean that there is nothing new in Berkeley’s ‘doctrine of signs’ in Alciphron. There are significant differences between the Principles and Alciphron. In the first place, it should be noted that Berkeley’s departure from Locke’s view of meaningfulness of words still remained half-hearted in the Principles. Although Berkeley opposed the strict Lockean position in the Introduction by pointing out the emotive use of words, in fact he may not have distanced himself so far from the Lockean position as it initially appears. For, in the same section 20, we see him stating that ‘when language is once grown familiar, the hearing of the sounds or sight of the characters is oft immediately attended with those passions, which at first were wont to be produced by the intervention of ideas, that are now quite omitted’ (my italics). This seems to indicate that in the Principles Berkeley saw the emotive use of words as an abbreviated form of the informative use in which the process of communicating ideas by words was originally preceding to the process of exciting emotions or actions in the hearer. If so, he was still working within the Lockean framework according to which the proper and primary function of language is informative. As for the action-regulative use, it is true that in the Principles he arrived at the view that in arithmetic (and more generally in algebra) numeral names and figures (and algebraic letters) were meaningfully used by virtue of their manipulability in accordance with the stipulated general rules. This is, to be sure, an anticipation of the position he develops in Alciphron. But at the stage of the first edition of the Principles he did not extend the same insight to characterize the nature of science in general; whereas in Alciphron he does.

Truly remarkable of Berkeley’s presentation of ‘the doctrine of signs’ in Alciphron is that he is
trying to put forward a synthesis of his earlier thoughts on language and signs. The particular points he makes mention of in the presentation of the ‘doctrine of signs’ can be traced back to his scattered remarks in the Principles, but in Alciphron he puts them together and rearrange them in a new light from an integrated viewpoint. The key move in such synthesis is to put the function of ‘words’ and that of ‘signs’ on the same level, regarding language in the narrow sense as just a species of ‘signs’.

In the Introduction to the Principles, Berkeley proposed to ‘premise somewhat … concerning the nature and abuse of language’ (Pl.6). But ‘the doctrine of signs’ in Alciphron is by no means restricted to considerations of language but is intended to clarify the nature and use of signs in general. In his response to Alciphron, Euphranor appears for a while to be concerned to establish the parity between religion and science with respect to the use of words, but as the dialogue goes on he gradually enlarges the horizon of discussion by relocating it in the broader context of the use of signs. Thus, Euphranor introduces ‘counter’ to explode the accepted Lockean view, with a remark that since words are signs, ‘it may not … be amiss to examine the use of other signs, in order to know that of words’ (Alc.VII-5). And illustrating the meaningful use of the scientific term ‘force’ without suggestion of an ‘abstract idea’, he mentions ‘the parallelogram of force’ which is used in the analysis of force and accelerated motion in Newton’s mechanics. This argumentative procedure suggests that by the time he wrote Alciphron Berkeley had arrived at a recognition that the study of language should be put on the wider horizon of the study of signs which subsumes all kinds of symbolic device we make use of in our intellectual thoughts and practical activities.

This enlargement of perspective in his presentation of ‘the doctrine of signs’ is important for understanding the novelty of Berkeley’s position in Alciphron in comparison with his position in the Principles. Earlier in the Introduction of the Principles, Berkeley still subscribed to the view that the informative use of ‘words’, i.e. communication of ideas, was fundamental to all other uses. While putting forward the emotive use of words as meaningful in section 20, he was only making
exceptions by pointing out ‘other ends’ in terms of which communication of ideas could be only secondary. The point about the non-informative meaningful use of words, therefore, was made without abandoning the core Lockean view that the proper and primary use of language is informative: the emotive use of words is indeed meaningful, but it presupposes the informative use of them and is ultimately derived from it. But now in Alciphron the broadened perspective in which ‘words’ are seen as continuous with ‘signs’ points to an entirely different picture of language. Here he is not just making exceptions to the Lockean view of language, but radically departs from it by denying the primacy of the informative use. If we enlarge the scope of attention from words to signs in general, it is clear that the informative use is not primary. Rather, the use of signs is primarily action-oriented, such as influencing emotions (e.g. bodily gestures), giving directions to actions (signposts), or helping us deal with things efficiently (counters, tickets, and artificial symbols of sciences). But if words are just a species of signs, why should we continue to hold that the informative use is fundamental to words? Thus viewing language in the light of ‘sign’ leads to the complete overthrow of the Lockean view of language.

From the new perspective which considers the use of language to be on a par with that of signs, the informative use can no longer be taken as fundamental to all other uses. Unlike in the Principles, Berkeley now clearly recognizes that the non-informative use of words, whether emotive or action-regulative, can stand independently of the informative use. It is not necessary for words to have a guarantee that they are ultimately cashable to ideas they are supposed to stand for. No such ideational backup to the use of words is required at all. It is quite significant that Berkeley illustrates his general moral of ‘the doctrine of signs’ by the example of ‘the root of negative square’ (i.e. imaginary number) which is obviously not cashable to ‘ideas’ of either sense or imagination.

... the true end of speech, reason, science, faith, assent, in all its different degrees, is not merely, or

213
principally, or always, the imparting or acquiring of ideas, but rather something of an active operative nature, tending to a conceived good: which may sometimes be obtained, not only although the ideas marked are not offered to the mind, but even although there should be no possibility of offering or exhibiting any such idea to the mind: for instance, the algebraic mark, which denotes the root of negative square, hath its use in logistic operations, although it be impossible to form an idea of any such quantity.

(Alc.VII-14; my italics)

Here the end of all the linguistic practices and discourses, from ordinary conversation to science and religion, is generally defined to be ‘of an active operative nature’. The ‘imperting or acquiring of ideas’ between the speaker and the hearer, which Locke supposed to be requisite to all meaningful linguistic exchanges, is only one of the varieties of ‘conceived goods’ we aim at in linguistic discourse. The crucial message of the above passage, which is implied by the example of ‘the root of negative square’, is that we can use language independently of any possibility of translating it to the corresponding ideas. No one, neither the inventor of imaginary number nor mathematicians who utilize the invention, has an ‘idea’ of this number. The objects they are acquainted with are the signs which represent imaginary number and the general rules applicable to them in the ‘logistic operations’ of algebra. Framing an idea of number is not ‘a conceived good’ in the science of algebra: its intended end is rather ‘of an active operative nature’. And Berkeley thinks this specific observation about the use of algebraic signs should be extended to the use of language in general. Thus, following the above passage he immediately goes on to remark: ‘what is true of algebraic signs is also true of words or language, modern algebra being in fact a more short, apposite, and artificial sort of language’.

In Alciphron, Berkeley uses arithmetic and algebra to clarify the point that the non-informative use of language can stand independently of the informative use. This is because the chief concern
of the discussion there lies in arguing against the alleged disparity between the language of religion and that of science. But the same point could be interestingly illustrated by the example of 'money' as well. In order to see the breadth of Berkeley's thought on 'signs' in the middle period, it will be instructive here to note the parallel between his presentation of 'the doctrine of signs' in *Alciphron* and his account of the nature of money in the *Querist*. In *Alciphron*, Berkeley used the model of 'counter' to explode Locke's criterion of meaningfulness. In the *Querist*, Berkeley holds money to be nothing other than 'tickets or counters'\(^48\). The particularly significant point is that Berkeley thinks money, of whatever material it is made\(^49\), can have use in economic operations *independently of* the guarantee of the things which have intrinsic value. It is not necessary that money is made of precious metals or is ultimately convertible to them, in order for them to have public use for purchasing goods or (as Berkeley sees it as one of the central functions of money) promoting people's industry. There are in fact no intrinsically valuable things which guarantee the use and circulation of money. Gold, silver, and even lands, which are all generally believed to have intrinsic value, are valuable only insofar as they are used as the means to excite people's industry\(^50\). Money, therefore, can fulfil its expected economic function without anything intrinsically valuable deposited in the bank. All that needs to maintain is the 'credit' of money which rests on the 'skilful management' of money by the national bank and ultimately on the whole sum of national wealth derived from the number, thrift, and industry of the people\(^51\).

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\(^{48}\) "Whether the true idea of money ... be not altogether that of a ticket or counter?" (Q.22)

\(^{49}\) Berkeley recommends small silver changes and paper money particularly in terms of its 'aptness for circulation' (Q.468).

\(^{50}\) 'Whether there be any virtue in gold or silver, other than as they set people at work, or create industry?' (Q.30); 'Whether it were not wrong to suppose land itself to be wealth? And whether the industry of the people is not first to be considered, as that which constitutes wealth, which makes even land and silver to be wealth, neither of which would have any value but as means and motives to industry?' (Q.38)

\(^{51}\) 'Whether the total sum of the public treasure, power, and wisdom, all co-operating, be not most likely to establish a bank of credit, sufficient to answer the ends, relieve the wants, and satisfy the scruples of all people?'(Q.432); 'Whether there be any difficulty in comprehending that the whole
In view of such large compass of Berkeley’s thought on ‘signs’ in the middle period, there is no exaggeration in Euphranor’s observation that ‘I am inclined to think the doctrine of signs a point of great importance and general extent, which, if duly considered, would cast no small light upon things, and afford a just and genuine solution to many difficulties’ (Alc.VII-13). What constitutes the central motif of Berkeley’s ‘doctrine of signs’ in Alciphron is clarification of the significance of symbolic substitution in human thoughts and activities. The development of this motif involves the rejection of his earlier view that signs are not as important as those which they signify. Clearly, by the time he wrote Alciphron Berkeley had become more appreciative of the potential of symbols in its own right. He is now well aware that the inventive use of signs plays quite a dynamic role in the development of human thoughts and activities: the substitution of ‘things’ or ‘ideas’ by ‘signs’ opens up the new possibilities we would not have without them. We should note that in Alciphron Berkeley has deepened the concept of ‘substitution’ with respect to this point. The relation of substitution between things and signs is reciprocal: we substitute things for signs and signs for things. But characteristic of Berkeley’s ‘doctrine of signs’ in Alciphron is the acknowledgement of the creative moment involved in the substitution of things by signs. When signs are used in place of things in our thoughts and activities and are finally referred back to the things they stand for, they add something new to the original things. That is to say, the ‘substitution’ of things by signs is not mere reciprocal exchange between things and signs but involves the enrichment or transformation, through the use of signs in place of things, of our way of dealing with things.

The significant insight which is relevant to understanding the novelty of Berkeley’s position in Alciphron is that the ‘substitution’ of things by signs, unlike that of signs for things, involves wealth of the nation is in truth the stock of a national bank? And whether any more than the right comprehension of this be necessary to make all men easy with regard to its credit?’ (Q.438) Although I have no space here to pursue it further, it will be easy to see the analogy between Berkeley’s view of ‘wealth’ and his theory of ‘knowledge’ by comparing precious metals with distinct ideas, bank notes and coins with scientific symbols. A discussion of such analogy (from a different angle) can be found in Berman, George Berkeley: Idealism and the Man, pp.169-70.
creativity. We see this insight clearly expressed in section 13 in his remark on the nature of science:

... all sciences, so far as they are universal and demonstrable by human reason, will be found conversant about signs as their immediate object, though these in the application are referred to things. The reason whereof is not difficult to conceive. For, as the mind is better acquainted with some sort of objects, which are earlier offered to it, strike it more sensibly, or are more easily comprehended than others, it seems naturally led to substitute these objects for such as are more subtile, fleeting, or difficult to conceive. Nothing, I say, is more natural than to make the things we know a step towards those we do not know; and to explain and represent things less familiar by others which are more so. (Alc.VII-13)

In this passage, Berkeley holds that signs are *constitutive* of scientific knowledge: the objects of science are *created in a certain sense* through the use of signs. Substitution of things by signs is essential to scientific knowledge in that only by mediation of signs the things which science is concerned to study can be made fixed before the understanding and rendered intelligible. Sciences are directly engaged with ‘signs’ instead of ‘things’ for the reason that they provide us with ‘a step towards those we do not know’. ‘Symbolic substitution’ is not simply to be taken as replacement of the things which are more important than signs but which we disregard for the moment. As Berkeley says in the above, ‘signs’ are *more clear, familiar, and comprehensible to us than those things for which they are to be substituted*. Thus he continues: ‘We substitute things imaginable for things intelligible, sensible things for imaginable, smaller things for those that are too great to comprehend easily, and greater things for such as are too small to be discerned distinctly, present things for absent, permanent for perishing, and visible for invisible. Hence the use of models and diagrams. Hence lines are substituted for time, velocity, and other things of very different natures’ (Ibid.). Symbols, then, are not mere temporary replacement of things which we can dispense with,
but indispensable instrument that we need to utilize in order to accomplish knowledge of those objects which would be out of our reach without the use of them.

In this recognition of the creative role of signs in thoughts and activities lies the core insight of Berkeley's conception of symbolic substitution. And it is through such insight into the significance of symbolic substitution that his 'doctrine of signs' shows a systematic departure from Locke's view of language. In *Alciphron* Berkeley is trying to put forward an alternative picture of the use of language (developed from a broader perspective of the use of 'signs') according to which the informative use constitutes only a part of our linguistic practice. The alternative general picture is summarized in Euphranor's statement that 'the true end of speech, reason, science, faith, assent, in all its different degrees, is ... something of an active operative nature, tending to a conceived good'.

As we saw by reference to 'the root of negative square', Berkeley is suggesting that language and signs can be used meaningfully without any possibility of translating them to the corresponding ideas. But now in terms of Berkeley's concept of symbolic substitution, we see a positive message in this rejection of the Lockean position. That is to say, his observation about the use of language and signs independent of any ideational backup leads to the affirmation of the creativity or inventiveness involved in our linguistic practice. According to the Lockean view, the proper function of language is restricted to communication of 'ideas' between the speaker and the hearer (or the recording of the 'connections of ideas' as they are established by mathematicians or philosophers through scientific demonstration). This view will not make room for the possibility that words or signs bring about any new contents for our understanding other than those we have already perceived in ideas; hence they cannot serve as the valuable instrument for our intellectual developments. But Berkeley's account of symbolic substitution as is elaborated in the above passage and the following parts of section 13 highlights such dynamic potential of signs.

As to the creativity of symbolic thought Berkeley recognizes in his account of 'substitution', it
will be explored further in the next section in connection with ‘knowledge of relations’. Here I want to draw attention to the point that Berkeley’s concept of symbolic substitution in *Alciphron* implies the rejection of the *intuitionist ideal* of knowledge in his early philosophy of the *Principles*. Clearly, the acknowledgement of the dynamic function of signs in the formation of knowledge, that through the inventive use of signs we are effectively directed to the attainment of knowledge and its further advancement, conflicts with the earlier theses that simple perceptual apprehension of ideas yields ‘perfect knowledge’ and that knowledge should be ultimately reduced to ‘clear perception’ of ideas. It is remarkable that in *Alciphron* the identification of knowledge with perception is supported by a free thinker who attacks religious faith. But such intuitionist view of knowledge is false; Berkeley now argues, since it assumes a wrong conception of the ‘design’ of human mind.

To trace things from their original, *human mind*, naturally furnished with the ideas of things particular and concrete, and being designed, not for the bare intuition of ideas, but for action and operation about them, and pursuing her own happiness therein, stands in need of certain general rules or theorems to direct her operations in this pursuit; the supplying which want is the true, original, reasonable end of studying the arts and sciences. (Alc.VII-11; my italics)

This provides the key to understanding the evolution of Berkeley’s theory of knowledge from the early to the middle period. Particularly noteworthy about this passage is the contrast Euphranor makes between ‘the bare intuition of ideas’ and ‘actions and operations about them’. He affirms that human mind is not ‘designed’ for intuition but for actions and operations. Accordingly, he suggests that the true end of sciences is to promote our *active* rather than *perceptive* power. And the ‘general rules or theorems’ are the chief concern of scientific studies since they serve to enhance the active power of the mind. Following Locke, Alciphron identified knowledge with *perception* of ‘ideas’,
and the proper function of language with the communicating (or recording) of ‘ideas’. But Euphranor responds to this Lockean view of knowledge and the role of language with the remark that such view not only shows ‘an ignorance of what knowledge is’ but rests on a particular picture of mind which is questionable. In his view, it is a mistake to set up the intuitionist ideal for the mind that all intellectual activities should ultimately aim at clear perception.

Euphranor’s speech in the above expresses decisive rejection of intuitionism which Berkeley earlier subscribed to, and it marks a significant turning point of Berkeley’s philosophy. The view of knowledge and language Euphranor approves of as truer in Alciphron is not the one Berkeley firmly embraced at the starting point of his philosophical career. On the contrary, as we saw in chapter 2, at the stage of writing the Principles, he accepted that very intuitionist ideal which he has Euphranor criticize in Alciphron. While correcting the narrowness of the Lockean view of language in the Introduction to the Principles, he nevertheless called for the readers’ constant effort of ‘laying aside all use of words in their meditations’ and ‘utmost endeavours to obtain a clear view of’ their ‘own naked, undisguised ideas’. As I argued, it is difficult to take this emphatic recommendation of ‘clear view’ in the Introduction as only of limited interest for the purpose of preventing the errors and confusions generated by the false doctrine of abstraction. By appeal to the ‘clear sight’ of ideas dispensing with words, he not only expected that we would find nothing other than particular ideas in our understanding. He also expressed an optimistic vision that attentive perception of such particular ideas, each of which we ‘clearly and adequately know’, would take us to ‘the fairest tree of knowledge’ which we find immediately ‘within our reach’. Accordingly, he remarked in the first edition of the Principles that ‘it may almost be made a question whether language has contributed more to the hindrance or advancement of the sciences’ – this was omitted in the second edition. It is undeniable that when he was writing the Introduction to the Principles, that meditative ideal of the ‘solitary philosopher’ in the Manuscript Introduction, i.e. the ideal of ‘thinking without words’ and
concentration on ideas as the true source of knowledge, was much alive in Berkeley.

But now in *Alciphron*, a new perspective is emerging about knowledge and the role of language and signs in its acquisition. In the passage of section 11 quoted above, he observed that human mind was designed ‘not for the bare intuition of ideas, but for action and operation about them’. From this standpoint the end of scientific study was said to consist in formulating ‘general rules’ which helps the mind’s actions and operations. Immediately after this, Euphranor continues:

Now, these rules being general, it follows that they are not to be obtained by the mere consideration of the original ideas, or particular things, but *by the means of marks and signs, which, being so far forth as universal, become the immediate instruments and materials of science*. It is not, therefore, by mere contemplation of particular things, and much less of their abstract general ideas, that the mind makes her progress, but *by an opposite choice and skilful management of signs*. (Alc.VII-11; my italics)

In this passage we clearly see that the central motif of Berkeley’s theory of knowledge has now shifted from ‘clear perception’ to ‘symbolic substitution’. Earlier in the *Principles*, the perception of particular ideas was essential in his account of the acquisition of knowledge, and for the better performance of attentive perception he called for ‘thinking without words’ as the proper method of knowledge. But now he unambiguously affirms the view that the objects with which science is directly concerned are not ‘the original ideas or particular things’ but rather ‘marks and signs’ of our own invention. The substitution of particular ideas by an artificial symbolic system is now regarded as an essential characteristic of scientific knowledge. The reason for the necessity of such substitution of ideas by artificial symbols is that the end of science is now being defined as consisting in the promotion of our active power, the chief task of science is to provide a certain general symbolic structure by mediation of which we direct our actions methodically. Such general
symbolic structure for regulation of our actions cannot be obtained as long as we just concentrate on particular ideas of sense, but rather it is necessary to give up directly dealing with them and contrive a system of artificial signs by means of which we deal with particular sensible ideas systematically by the aid of general rules. Thus the advancement of scientific knowledge is made possible not by ‘mere contemplation’ of ideas, whether they are particular or abstract, but rather by the invention and operation of a system of signs.

2. Symbolic substitution and scientific knowledge as ‘knowledge of relations’

In chapter 1, we saw that in the second edition of the *Principles* Berkeley introduced the *third* category of the object of human knowledge, i.e. ‘relations’. In the added passage of section 89, he regarded ‘relations’ as ‘the object of knowledge and subject of discourse’ in its own kind, distinguishing them from ‘ideas’ and ‘spirits’ . There I suggested that this introduction of ‘relations’ should be interpreted by reference to the coordinating correction of section 101 in the same edition. According to the initial statement of section 101, *natural philosophy* and *mathematics* were said to be ‘conversant about ideas received from sense’, but in the later edition they are said to be ‘conversant about ideas received from sense and their relations’. I also suggested in the same place that this introduction of ‘relations’ to Berkeley’s system of knowledge can be seen as closely connected with the development of his view of the relationship between knowledge acquisition and the use of ‘signs’. Thus far, we have seen Berkeley’s reconstrual of ‘the doctrine of signs’ in *Alciphron* in opposition to the Lockean thesis about the meaningful use of language. This shows a new development from his earlier view in the *Principles* about the role of language and signs in scientific knowledge. In this section, I will discuss how the introduction of ‘relations’ as the third distinct category of knowledge can be interpreted in the light of ‘the doctrine of signs’ in *Alciphron*. 

222
In the following, I will try to connect the point we saw in section 1 above, his view of scientific knowledge that it involves the construction of a symbolic system for the regulation of action with his view that scientific knowledge is ‘knowledge of relations’ by the use of symbols.

As I mentioned in chapter 1, the correlation between Berkeley’s introduction of ‘knowledge of relations’ and his thought about the role of signs in scientific studies will suggest itself when we compare two passages written in two years interval, one from the first/second edition of Alciphron (published in 1732) and the other from the second edition of the Principles (published in 1734). They were quoted in chapter 1 but here I will quote them again for my discussion of this section.

[A]ll sciences, so far as they are universal and demonstrable by human reason, will be found conversant about signs as their immediate object, though these in the application are referred to things. (Alc.VII-13)

The two great provinces of speculative science, conversant about ideas received from sense and their relations, are natural philosophy and mathematics. (PHK.101)

Clearly, these two statements complement each other. In Alciphron, Berkeley states that science is conversant about sensible ideas and signs. In the Principles, he states that it is conversant about sensible ideas and relations. Comparing these two, it is natural to conjecture that during the period of 1732-34, he considered these two points to be mutually connected: scientific knowledge consists in knowledge of the ‘relations of ideas’ and such knowledge necessarily involves the construction of a symbolic system. His initial definition of science that it is ‘conversant about ideas received from sense’ is now found unsatisfactory. But how does he combine these two characteristics? And what does this view of the nature of scientific knowledge newly developed in the middle period
add to the account of natural philosophy initially given in the first edition of the *Principles*? As to
the second question, I will turn to it in the next section where I look at his treatment of Newton’s
mechanics in another middle period work, *De Motu*. In this section, the focus of our inquiry is on
the first question. The clue to approach this question is given by Berkeley himself in the last, third
edition of *Alciphron* published in 1752.

In the third edition of *Alciphron*, Berkeley added several passages to the seventh dialogue
which correspond to the second-edition revisions in the *Principles*. The two inserted passages are
remarkable since they cast considerable light on the connection between ‘knowledge of relations’
which is barely mentioned in the *Principles* and the ‘doctrine of signs’ in *Alciphron*.

The signs, indeed, do in their use imply relations or proportions of things; but these relations are not
abstract general ideas, being founded in particular things, and not making of themselves distinct ideas
to the mind, exclusive of the particular ideas and signs (Ale.VII-12; my italics).

[S]igns may imply or suggest the relations of things; which relations, habitudes, or proportions, as they
cannot be by us understood but by the help of signs, so being thereby expressed and computed52, they
direct and enable us to act with regard to things (Ale.VII-14; my italics).

Euphranor’s point of emphasis in the first quotation is that ‘relations’ are not ‘abstract general ideas’.
When we think about or know the relations of things, all that we have before us is ‘particular ideas
and signs’, and our knowledge of relations does not consist in the perception of abstract ideas of
relations distinct from them. This shows, as I have noted earlier in chapter 3 in discussion of

52 The original word in the text of *Alciphron* is ‘expressed and confused’. But in this quotation I
corrected it for ‘expressed and computed’, following the suggestion of the editor of the third
volume of Berkeley’s *Works* (T.E. Jessop) which is made in the *Addenda* (*Works*, vol. IX, p.8).
knowledge of 'number', that Berkeley never regarded his introduction of 'relations' as acceptance of the kind of abstraction he had formerly repudiated in the *Introduction* of the *Principles*. But what I want to observe here in particular is that Berkeley puts forward a significant view about the way we know 'relations': while 'knowledge of relations' is not knowledge about 'abstract general ideas', it is also different from just having 'particular ideas' before our perception. The remarkable suggestions which are clearly read in the above quotations are that relations cannot appear as distinct items before the mind 'exclusive of the particular ideas and signs', and that they 'cannot be by us understood but by the help of signs'.

Undoubtedly, these passages in the last edition of *Alciphron* provide a very important clue to understanding the linkage between Berkeley's sparse remarks about 'relations' in the *Principles* and his considered view about scientific knowledge. But this connection has never been seriously considered by commentators. Now there are two important points suggested in the above quoted passages (and they are found in no other place of his works) which serves to clarify how Berkeley conceived scientific knowledge as 'knowledge of relations' by the use of artificial signs.

1) Our understanding of 'relations' essentially *depends on* the use of 'signs',

2) 'Relations' are not identical with 'signs', but are the objects *expressed by* them.

Therefore, to the question, how are the two defining characters of scientific knowledge, that it involves the use of 'signs' and that it is about 'relations', interconnected? The answer given by Berkeley in the last edition of *Alciphron* is that in scientific studies, signs are *indispensable media*

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53 The only exception I know is A.C. Lloyd who recognized the significance of the third-edition passages I quoted above and called attention to them by noting, 'This surprising addition has not received the attention it should'. See 'The Self in Berkeley's Philosophy', p.208. But Lloyd dealt with 'relations' in only less than two pages at the end of his paper, and chiefly considered 'relations' in the context of Berkeley's theory of mind rather than his theory of scientific knowledge.
by which we know relations; that we think about and know the relations of particular ideas only by
the use of signs or their systematic combinations which are designed to express their relations. And
this answer also casts light on the question about the new introduction of the category of ‘relations’
as the third, distinct kind of object of knowledge in the second edition of the Principles. It is
because of this necessity of symbolic substitution, because of this indirect nature of ‘knowledge of
relations’ that Berkeley came to hold in the middle period that it constitutes a unique province of
knowledge distinct from ‘knowledge of ideas’ and ‘knowledge of spirits’. Scientific knowledge is
‘knowledge of relations’ which is acquired only by the use of ‘signs’. However, this only gives us
the starting point to explore yet another, more fundamental question: the point now being
confirmed that Berkeley thinks ‘knowledge of relations’ essentially involves symbolic substitution,
how should we interpret this point in connection with his thought we saw in section 1, that science
depends on the use of artificial signs for the achievement of its end that it regulates our actions
systematically by general rules and thereby enhances the active power of our mind?

Here we seem to have two different lines of thought by which Berkeley insists on the moment
of symbolic substitution in scientific knowledge. According to the first line of thought, science
cannot dispense with symbols because the regulation of action by general rules requires the use of
them. According to the second line of thought, it cannot dispense with symbols because it studies
‘relations’ as its object and this object ‘cannot be by us understood but by the help of signs’. To put
it in other words, one highlights the regulative role of symbols in science, considering them in
terms of practical significance; and the other highlights the descriptive role of symbols in science,
considering them in terms of theoretical significance. But are these really two different thoughts in
Berkeley’s mind? I think not. As I see it, there is no sharp dichotomy for Berkeley between
practical and theoretical spheres of scientific studies, and the use of symbols in science consists in
their having descriptive and regulative roles at the same time. This is, I think, exactly what he
implied when he had Euphranor criticize the popular view about the nature of science that it aims at having ‘the bare intuition of ideas’ without regard to ‘action and operation about them’. By correcting this popular misunderstanding, Berkeley did not intend to isolate the practical significance of science from theoretical interests and thereby confine the task of science to the mere exercise of symbolic computation and the application to practical life. On the contrary, he was critical of the clean separation of theoretical interests from practical concerns in scientific studies, and insisted, without denying that science aims at the understanding of the world by construction of theories, that scientific enterprise of better understanding the world should always be coordinating with the practical concern for action in the world.

It has sometimes been suggested that Berkeley’s defence of Christian religion in Alciphron by clarification of the nature of science rests on his insistence on the distinction of the practical context of linguistic uses from the theoretical context, and that in his account of the meaningful use of language in science he is only concerned with the practical applications of scientific symbols. Jonathan Bennett remarked, discussing the passage in section 14 where mathematics is characterized as ‘instruments to direct our practice’, that in Alciphron ‘Berkeley is concerned with non-theoretical or practical uses of language. He thinks that mathematics is best considered not as a set of theoretical truths but rather as a practical instrument, as something which can help us to build bridges and the like’.

But here Bennett misunderstands Berkeley, as Anthony Flew argued, in thinking that even at the stage of Alciphron Berkeley still remains within the Lockean position. According to Bennett, in Alciphron Berkeley remained faithful to the Lockean requirement of annexing ideas to words in the theoretical uses of language but only rejects it in the practical uses of language; thus, when Euphranor speaks about the meaningful use of language without ideas by

the example of science, what he has in mind is only practical uses as separate from theoretical uses. Bennett is mistaken in thinking that Berkeley’s positive appraisal of symbolic thought in science cannot be taken to imply his rejection of the Lockean view that linguistic or symbolic thought should rest on ideational thought. It is true that in Alciphron Berkeley represents science as ‘a practical instrument’, stating that ‘science is very rightly esteemed an excellent and useful one, and is really found to be so in many occasions of human life, wherein it governs and directs the actions of men’ (Alc.VII-15). But it would not follow from this that the use of signs in science is not concerned with the elaboration of theories at all, or that in scientific studies there are only practical uses of language as strictly distinguished from theoretical uses.

As I see it, Berkeley holds that theoretical constructions and developments are central to scientific studies because the instrumental effectiveness of science in the application to practical life is augmented in proportion to the refinement of scientific theories. In connection with this point, it is especially interesting and noteworthy that in Alciphron Berkeley is clear how the heuristic use of artificial symbols is essential to the further development of scientific theories. In the passage of section 11 of the seventh dialogue, which I quoted in the previous section, Euphranor was observing that it is ‘by an apposite choice and skilful management of signs’ that we can make progress in scientific studies. In the subsequent passage of section 12, he explains this point further by taking arithmetic as the paradigmatic example to illustrate the nature of all scientific studies.

[The] marking or notation [of arithmetic] would, in proportion as it was apt and regular, facilitate the invention and application of general rules to assist the mind in reasoning and judging, in extending, recording, and communicating its knowledge about numbers: in which theory and operations, the mind is immediately occupied about the signs or notes, by mediation of which it is directed to act about things, or number in concrete (as the logicians call it), without ever considering the simple,
abstract, intellectual, general idea of number. (Alc.VII-12; my italics)

This passage clearly shows that, contrary to Bennett’s contention, Berkeley is far from cleanly separating the practical uses of language and signs in science from their theoretical uses. Rather, he thinks the practical utility and theoretical development are closely coordinated in scientific studies and that the use of language and artificial signs has essential contribution in both of these spheres. Here we should note that this attention to the heuristic significance of symbols in theoretical construction of science is novel to Alciphron. In the *Principles*, as we saw in chapter 3, Berkeley was speaking about the capacity of numeral signs to ‘aptly express’ the numbers of things. But there he only considered the ‘aptness’ of symbols in terms of its contribution to the efficiency of calculation and applicability to things. In *Alciphron*, the ‘aptness’ of symbols is also considered in terms of its heuristic role for further theoretical developments in arithmetic. The ‘apposite choice’ of signs is essential not only for the efficient operations and applications of them within the established theories but also for the exploration and discovery of the new field of arithmetical knowledge by the invention of new rules and expansion of symbolic system; as arithmetic was helped to expand its field of study from natural number to fractions and irrational numbers by the employment of the Arabic-Indian notation and the operation system invented on its basis.

Therefore, by the middle period, Berkeley reached the view of scientific knowledge which does justice to the dynamic aspect of scientific occupation. He does not hold that science should occupy itself *merely* with symbolic computations and their application to the service of practical interests but clearly acknowledges the *coordination* between practical concern and theoretical refinements in scientific studies. For Berkeley, science is not predominantly concerned with doing rather than understanding things by signs. Although he repudiates ‘barren speculations’ by putting emphasis on the ‘useful purposes’ of scientific knowledge, this does not mean that scientists should remain
indifferent to speculative concerns or give up all efforts for the development of scientific theories. Rather, it is the central point in his characterization of science as essentially mediated by symbols that our intellectual power of understanding the world and our practical power of doing things in it are closely interrelated in the ability of using symbols. The moment of symbolic substitution which Berkeley conceives as characteristic of science contributes to the augmentation of both of intellectual and practical powers. The progress in our understanding of the world essentially depends on the judicious and skilful construction of a system of signs which helps further advancements in scientific theories, and this intellectual progress made by mediation of symbols immediately leads to the improvement of our active power by the application of the system of signs to practical life. Thus, from the standpoint Berkeley submits in *Alciphron* that ‘all sciences are conversant about signs as their immediate object’, there is no sharp distinction between theories and practical application: understanding the world and doing things in it are just two continuous dimensions of the intellectual-cum-practical ability of using symbols.

Now, to return to our original question about the interconnection of Berkeley’s two lines of thought about the nature of science, namely, that science uses symbols for the regulation of actions and that it uses symbols as the means to represent ‘relations’, it is by now clear how we should piece them together. Since Berkeley acknowledges that scientists are concerned with theoretical understanding of the world as well as with practical regulation of actions in it, the use of symbols in scientific studies should have contribution to both of these concerns. In its theoretical sphere, science uses symbols for constructing theories and formulating general rules. By such contrivance of a symbolic system which is articulated and orderly structured by general rules, we represent certain relations of particular things in the world. And in scientific studies, we can think about and know ‘relations’ of things mediately by dealing with the system of signs which express them. On the other hand, the symbolic constructions of science, once contrived, provide scientists with the
groundwork for further elaborations in theory by invention of new symbols and regulative rules. By such development in theoretical sphere through the expansion of symbolic construction, science *enlarges its representational capacity* with regard to ‘relations’: the refinements of symbolic device to express the relations of things *improve our understanding* of them by enabling us to think about relations of *more complexity* (as in the extension of number to fractions and irrational numbers) and of *more general applicability* (as in the development of arithmetic to algebra). At the same time, this theoretical advancement in the symbolic construction to represent ‘relations’ also benefits us in the *practical* sphere in the regulation of actions in practical life. By mediation of symbolic systems which have the greater capacity to represent relations of things and which have the clearly defined rules of operation, we can *direct our way in the world with more exactness and in greater scales* than we do without them. Thus, the two functions of symbols to represent relations and to regulate actions are coordinating in scientific enterprise.

In chapter 3, we saw that in his treatment of arithmetic in the *Principles* Berkeley came near to the view that knowledge of number is ‘knowledge of relations’ by symbolic substitution, though at that stage he did not explicitly endorse this position. And the central message of his discussion about the nature of arithmetic was that ‘in *arithmetic* … we regard not the *things* but the *signs*, which … are not regarded for their own sake, but because they direct us how to act with relation to things, and dispose rightly of them’ (PHK. 122). While in the *Principles* he preferred to say that this action-regulative function of arithmetical symbols rests on their capacity to ‘represent aptly whatever particular things’ we number (Ibid.), we now see that in *Alciphron* he explicitly holds (though he does so only in the third edition) that the action-regulative function of symbols rests on their capacity to represent the *relations* of things. This shift shows Berkeley’s deeper appreciation of the nature of symbolic representation in *Alciphron* than in the *Principles*. When he first considered the function of arithmetical symbols in the *Principles*, his attention was chiefly directed to the *fact*
that numeral names and figures play the regulative role in our thinking about and knowing numbers, but he did not make serious attempt to look into the ground of this fact. Thus, despite his insight in section 121 that arithmetical signs regulate our thoughts by the *orderly structure* they embody, he tended to remain within the view that the objects those signs ‘aptly represent’ are ‘particular things’ and nothing more. But the reason why arithmetical signs so successfully regulate our thought is that they *only represent the relations* of things *without representing things* at all. The symbolic system of arithmetic is contrived to enable us to concentrate our attention to the relations of number standing between particular things: it conserves the relations of number by exclusion of all other qualities possessed by particular things and transfer those relations to the different media, arithmetical symbols; and through manipulation of those well-organized and easily manageable symbols which represent relations of number, we can acquire knowledge of them systematically. The objects of symbolic representation are, therefore, not concrete particular things themselves but only their relations which are distinguishable from them. In *Alciphron*, I think, Berkeley finally came to clearly recognize and affirm this point.

3. ‘The grammar of nature’ in *De Motu*: mechanics and metaphysics

(1) Berkeley’s view of dynamical concepts as ‘mathematical hypotheses’

In section 3 of the previous chapter, we have seen Berkeley’s critique of the concept of ‘attraction’ in the *Principles*. Berkeley there speaks highly of Newton’s accomplishment in the *Principia Mathematica*, characterizing it as ‘the best grammar of nature’. But, as we saw, this characterization of Newton’s mechanics was developed in conjunction with the thesis that scientific knowledge of nature never amounted to ‘an exacter knowledge of the efficient cause’ of phenomena (PHK.105). The proper task of natural philosophy considered as ‘the grammar of nature’, as Berkeley defines it,
is restricted to the formulation of 'the laws of nature' and induction of particular phenomena to them. Accordingly, the concept of 'gravitation' or 'mutual attraction' which plays the central role in Newton's dynamical system of the world should be interpreted in conformity with such minimalist view of scientific enterprise. Thus the term 'attraction' is not to be taken as referring to a causal principle productive of phenomena, but only to 'a certain similitude of appearances', i.e. the bodies' mutual approach discoverable by 'observation and comparison' of phenomena (PHK.104). From this standpoint, Newton's reduction of all celestial and terrestrial motion to the universal law of 'gravitation' was considered by Berkeley to be just concerned with similarities, however general they may be, at the level of surface observation. Thus, while Newton's system affords us 'a greater largeness of comprehension' by expansion of the knowledge of phenomenal similitude in diverse parts of nature, it never affords us a deeper insight into the unobservable mechanism which underlies the pervasive similitude across the natural world.

In this section, we explore Berkeley's account of scientific knowledge in his middle-period work *De Motu*, which represents his mature view of the nature of Newton's mechanics. As it is stated in the title, this work aims to consider 'the principle and nature of motion and the cause of the communication of motion'. But the main focus of discussion is on 'the principle and nature' of motion. In the analysis of 'the principle of motion', Berkeley considers motion in terms of its 'cause'; and in the analysis of 'the nature of motion', he criticizes the concept of 'absolute motion' by way of attacking the concept of 'absolute space'. Needless to say, his discussion of either of these subjects is continuation of the philosophical assessment of Newton's *Principia* he gave earlier in the *Principles*. Our attention in this section will be chiefly directed to the part where Berkeley

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discusses ‘the principle of motion’, without getting into his criticism of absolute motion. The key point in his discussion of ‘the principle of motion’, which is also central to understanding Berkeley’s view of the nature of Newton’s mechanics in De Motu, is the sharp line he draws between the mechanical and metaphysical principles. Berkeley defines the proper task of mechanics to be the study of motions (and various natural phenomena derived from motions) by general laws, which he calls the ‘mechanical principle’. The study of motions by their ‘true cause’, on the other hand, is said to belong to an entirely different province, i.e. ‘metaphysics’. While such restriction of the task of natural science appeared earlier in the Principles, Berkeley’s discussion in De Motu exhibits significant developments in comparison with his earlier view. Firstly, he regards the ‘mechanical principle’ not just as general laws but as the most encompassing laws applicable to the greatest scope of phenomena, such as Newton’s laws of motion. Berkeley has now become more sensitive to the demand of universality in the pursuit of scientific knowledge, and in terms of the ideal of universal knowledge he re-evaluates Newton’s achievement in the Principia.

Secondly, in accordance with such increased sensitivity to the universality of scientific laws, Berkeley revises his view about the status of dynamical concepts and thereby goes beyond his earlier phenomenalist interpretation of Newton’s dynamical system of the world. The outlook of scientific knowledge implied by this new development is that it is no longer to be conceived, as it was in the Principles, as continuous with ordinary knowledge of nature. The ‘grammar of Nature’ with which natural philosophers occupy themselves does not remain on the level of mere empirical generalization, but involves elaborate theoretical construction by the inventive use of artificial

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signs. Berkeley’s treatment of ‘force’ in the middle period can be seen as closely connected with his deeper appreciation of the creative role of symbols in the formation of scientific knowledge. This is sufficiently shown in our discussion of Berkeley’s account of symbolic substitution in Alciphron in the preceding sections of this chapter. In line with such recognition of the creativity of symbolic thought, the conspicuous feature of Berkeley’s account of Newton’s mechanics in De Motu is that he takes rather positive attitude to the use of hypothesis: dynamical terms are now given the status of ‘mathematical hypothesis’. This indicates a significant change from his position in the Principles, according to which the term ‘attraction’ just refers to phenomenal similarities. While maintaining the central point about the irrelevance of causal inquiry in natural philosophy, Berkeley now acknowledges that scientific knowledge is concerned with certain deep structures which underlie observable phenomena. The formulation of scientific laws should rest on the identification of such deep structures, that is, hidden analogies of phenomena distinguished from their surface similarities. Thus the treatment of ‘force’ as ‘mathematical hypothesis’ corresponds to the renewed conception of laws and the nature of scientific knowledge Berkeley puts forward in De Motu.

The chief concern of this section is to explore how far Berkeley succeeded in De Motu, which contains new developments as mentioned above, in his attempt to reinterpret Newton’s dynamic view of the world. As a philosopher of the post-Newtonian age in Britain, Berkeley had a sincere respect for Newton’s accomplishment in the Principia. But on the other hand, far from an uncritical follower, he never hesitated to attack whatever aspects of Newton’s doctrine which he found philosophically unsound or theologically dangerous. Thus, as to the concept of absolute space,

59 As to his critical approach to Newton’s mechanics, Berkeley has been compared with Mach, who argued that the concept of ‘force’ was nothing more than conventional signs which serve for the ‘economy of thoughts’, and that the distinction between absolute and relative space and motion was actually dispensable to the construction of mechanics. Popper discussed Berkeley’s anticipation of Mach (and Heinrich Hertz). Karl Popper, ‘Berkeley as precursor of Mach and Einstein’, British Journal for the Philosophy of Science 4 (1953), pp. 26-36. See also G.J. Whitrow, ‘Berkeley’s Philosophy of Motion’, The British Journal for the Philosophy of Science, vol.4, no.13
Berkeley was consistently critical from the *Principles* to *Siris* and believed that the relative space and motion provides sufficient framework for describing all kinematic phenomena. Here the focus of interest for us is Berkeley’s treatment of dynamical concepts like ‘force’ and ‘gravity’ which are essential to the construction of Newton’s dynamical system. As to this point, his attitude is clearly more conciliatory: instead of arguing that the concept of ‘force’ should be entirely eschewed, he acknowledges that ‘force’ and the related concepts are indispensable to mechanics. Berkeley never retracts the central claim of his metaphysics that there is no efficient causality in physical things which, being ‘ideas’, are all passive and inert. But at the same time, he allows ‘force’ and ‘gravity’ to be usefully employed within the boundary of the science of mechanics. Central to understanding this attitude to dynamical concepts is Berkeley’s notion of ‘mathematical hypothesis’ and his strict demarcation of mechanics from metaphysics. In the followings, we will try to clarify Berkeley’s view of these points by comparison of his position with Newton’s.

To start with, let us look at Berkeley’s view about the use of dynamical concepts in mechanics. As I have noted, what he says on this point in *De Motu* is clearly continuous with his discussion of ‘the doctrine of signs’ and the nature of scientific knowledge he develops later in *Alciphron*.
Force, gravity, attraction, and terms of this sort are useful for reasonings and reckonings about motion and bodies in motion, but not for understanding the simple nature of motion itself or for indicating so many distinct qualities. (DM.17)

... the mechanician makes use of certain abstract and general terms, imagining in bodies force, action, attraction, solicitation, etc., which are of first utility for theories and formulations, as also for computations about motion, even if in the truth of things, and in bodies actually existing, they would be looked for in vain ... (DM.39)

The chief point of Berkeley in the above passages is the distinction of two contexts in which dynamical terms such as 'force' and 'gravity' are used. The term 'force', for example, may be used for 'reasonings and reckonings' or 'theories and formulations' about motion. But the same term may be used to refer to certain qualities which reside in bodies - the dynamic properties considered as the cause of motion. According to Berkeley, it is only in the former context that the concept of force is considered 'useful' in mechanics. Now, in section 1 of this chapter, we have seen Berkeley's discussion in Alciphron of the meaningful use of the term 'force' by comparison with the religious term 'grace'. As Euphranor argued, the Lockean criterion of meaningfulness, according to which the use of words and signs should always involve communication of 'distinct ideas', undermines the use of 'force' in science as well as the use of 'grace' in religion; for, if 'force' is taken to refer to the cause of phenomenal motion, we have no more distinct idea of it than we have the idea of 'grace', which is the cause of visible moral actions. The use of 'force' is rather action-oriented: it is meaningfully used for the action-regulative purpose, i.e. for direction of our actions by 'general rules' of the mechanical system and calculation of kinematic phenomena by those rules. In Alciphron the non-informative use of 'force' is highlighted in the context of
defending religion, but in *De Motu* the same point is made to restrict the legitimate scope of science: the science of mechanics is never concerned with the true efficient cause of phenomena.

Now, Berkeley’s insistence in the above passages on the distinction of two contexts in which the same dynamical term may be used is not his innovation. It is probable that his observation about the use of dynamical terms for mathematical construction without reference to dynamic properties in bodies is partly based on several remarks Newton issued in the *Principia*. In the opening pages of the *Principia*, before proceeding to the formulation of the three laws of motion, Newton defines basic concepts of his dynamic system, such as mass, quantity of motion, innate force (*vis insita*), impressed force (*vis impressa*), etc., one after another. In definition V he defines ‘centripetal force’, on which the concept of ‘gravitation’ crucially rests, and after distinguishing three kinds of quantity (absolute/accelerative/motive quantity) with regard to centripetal force in definitions VI-VIII, he goes on to note: ‘I here design only to give a Mathematical notion of those forces, without considering their physical causes and seats’ (my italics). This brief note is further elaborated a bit later in a remark he issues on the *indifference* between his uses of ‘attraction’ and ‘impulse’.

1 … use the words Attraction, Impulse, or Propensity of any sort towards a centre, promiscuously; and indifferently, one for another; considering those forces not Physically but Mathematically: Wherefore, the reader is not to imagine, that by those words, I any where take upon me to define the kind, or the manner of any Action, the causes or physical reason thereof, or that I attribute Forces, in a true and physical sense, to certain centres (which are only Mathematical points); when at any time I happen to speak of centres as attracting or as endued with attractive powers.

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62 Ibid., p.8-9.
What Newton wants to mean here by the indifference between ‘attraction’ and ‘impulse’ is not that there is not any difference in these two concepts when they are used in the explanatory framework of the *Principia* which is mathematically constructed. Rather, he means that his use of the term ‘attraction’ is not concerned to specify a certain *physical quality* which is supposed, by some occult power or virtue, to act at a distance; the term ‘attraction’ does not refer to the power which acts in the way different from the way commonly called ‘action by impulse’ (or ‘contact action’) by physicists and which is accepted to be the only intelligible cause of the motion of bodies.

In a number of places in the *Principia*, Newton repeats that physical causes are out of the scope of his study since it is concerned solely with the *mathematical* principles of natural philosophy, and that he is not to be taken as providing *physical* explanation of phenomena in any place where he uses the term ‘attraction’. The concept of ‘attraction’ (that is, ‘centripetal force’ as explicated in definition V) is central to Newtonian ‘system of the world’ developed in the *Principia*, and has clear mathematical contents and extensive applications in mathematical demonstrations. Diverse phenomena, free fall and projectile motions on earth, orbital motion of planets, etc., are explained by the mathematical formulation of attractive force — those various motions are brought to be subsumed under the inverted-square formulation of gravitation by conceptualizing them in terms of a mass point which is diverted from its inert rectilinear motion by virtue of a certain force existing at the geometric centre and is accelerated towards it — and thus are *mathematically* made intelligible.

But Newton pronounces that in the *Principia* he had left it open what is the true cause of centripetal force, *without even determining whether it is physical or spiritual*. In the scholium to proposition 69, section XI, Book I, the same point as stated in definition VIII is developed in some more detail.

I here use the word attraction in general for any endeavour, of what kind soever, made by bodies to approach to each other; whether that action arise from the action of the bodies themselves as tending
mutually to, or agitating each other by spirits emitted, or whether it arises from the action of the aether or of the air, or of any medium whatsoever, whether corporeal or incorporeal, any how impelling bodies placed therein towards each other. In the same general sense I use the word impulse, not defining in this treatise the species or physical qualities of forces, but investigating the quantities and mathematical proportions of them; as I observed before in the definitions. 63

Newton had reasons to put particular emphasis on the point that his use of the term ‘attraction’ in the Principia had no bearing on the question about causes. On the one hand, he was annoyed by the charge made by the continental critics, such as Huygens and Leibniz, that he was reviving physics of ‘occult qualities’ by invoking attractive force. On the other hand, he wanted to distance his ‘experimental’ physics from the Cartesian ‘hypothetical’ physics which he thought was building up groundless speculations about physical causes of phenomena. Cartesians believed that the only kind of explanation which is acceptable in physics is mechanistic explanation by figure, size, and motion of minute particles, and invoked the flow of aethereal vortices towards the earth which carries the gross bodies down to the earth in the attempt to account for the causal mechanism of gravitation. In opposition to them, Newton consciously restricted his task to the mathematical treatment of motion which is concerned with the quantitative description of phenomena by formulated laws, without getting into the physical qualitative account of them.

It is likely that Berkeley has the passage of definition VIII of the Principia in mind (and perhaps Query 31 of the Optics as well) when he stated that the terms ‘force, gravity, attraction’ are ‘useful for reasonings and reckonings about motion and bodies in motion, but not for understanding the simple nature of motion itself or for indicating so many distinct qualities’ (my italics). That he takes Newton’s remark there to heart from earlier on is indicated by his observation in the Principles that

63 Ibid., p.262.
by the word *attraction* ‘nothing is determined of the manner or action, and it may as truly (for
ought we know) be termed *impulse* or *protrusion*’ (PHK.103). But while in the *Principles* Berkeley
preferred to interpret Newton’s ‘attraction’ (which has no reference to real physical cause) as
referring to the *phenomena* of bodies’ tending towards each other, in *De Motu* he does not simply
equate the concept of attraction with kinematic phenomena themselves. Thus, immediately after the
remark of section 17 just quoted, he observes: ‘As for attraction, it was certainly introduced by
Newton, not as a true, physical quality, but only as a mathematical hypothesis’ (DM.17). In another
place discussing the communication of motion, he applies the same point to ‘force’ in general.

... all forces attributed to bodies are mathematical hypotheses just as are attractive forces in planets
and sun. But mathematical entities have no stable essence in the nature of things; and they depend on
the notion of the definer. Whence the same thing can be explained in different ways. (DM.67)

Thus, according to Berkeley, it is not only ‘attraction’ that is considered a mathematical hypothesis;
the general concept of force, which subsumes under it what Newton calls ‘innate force’ (the force
which is responsible for inertial rectilinear motion, as explicated in definition III) and ‘impressed
force’ (the force which accounts for the change of velocity or acceleration in bodies, as explicated
in definition IV), is also to be considered a mathematical hypothesis. And in the above passage, we
can see what Berkeley wants to mean by ‘mathematical hypothesis’: he conceives hypothesis as
*m mathematical fictions or heuristic devices fashioned for some explanatory purpose in science*.64

The conception of mathematical hypothesis had already appeared in the *New Theory of Vision*,

64 Lisa Downing (in ‘Berkeley’s Natural Philosophy and Philosophy of Science’, p.263, n.50)
takes (following Karl Popper) Berkeley’s concept of ‘mathematical hypothesis’ as referring to its
function as a *calculating* device, but I would rather put emphasis on its *heuristic* role in mechanics.
As I argued in section 1 and 2, Berkeley’s discussion of ‘the doctrine of signs’ in *Alciphron* takes
into account the heuristic significance which ‘force’ terms have for the ‘invention’ of general rules.
where he remarked about the lines and angles in geometrical account of vision that they ‘have no real existence in nature, being only a hypothesis framed by the mathematicians, and by them introduced in optics, that they might treat of that science in a geometrical way’ (NTV.14).

From the above discussions it is apparent that Berkeley intended to distinguish between the use of dynamical concepts in the context of mathematical calculations or demonstrations and their use in the context of physical causal explanations in line with Newton’s distinction in the Principia (and in the Optics) between the ‘mathematical’ and ‘physical’ uses of ‘attraction’. But this does not mean, of course, that he rightly interpreted Newton. Nor is it the case that he intended to be strictly faithful to Newton’s way of conceiving the nature of explanation in mechanics. Berkeley is well aware that Newton never intended to say that his concept of ‘attraction’ or ‘centripetal force’ is a mathematical hypothesis. And he certainly does not think Newton holds that the concept of ‘force’ in general should be on equal footing with ‘attraction’. Rather, Berkeley in De Motu can be seen as deliberately aiming to construct his positive account of mechanics by drawing on Newton’s view that for the purpose of mathematical treatment of ‘attraction’ (and this is the chief concern of Newton in the Principia), the specification of its physical nature can be set aside. In the following second half of this section, we will see how Berkeley radicalizes Newton’s precautionary remark on the irrelevance about deciding the true nature of attractive force in the mathematical treatment of it, going beyond Newton by insisting that investigation of the cause of attractive force should be beyond the scope of mechanics since it is properly the subject of metaphysics. But, as I will argue, his demarcation of mechanics from metaphysics has a positive implication: he invokes a new notion of causal explanation in mechanics in which the laws of nature, rather than physical cause, is accorded the status of ‘cause’ in the explanatory system of mechanics.

(2) The ‘mechanical’ and ‘metaphysical’ principles: two senses of ‘causal explanation’ and
Berkeley's demarcation of mechanics from metaphysics

Newton's *Principia*, as well as the *Optics*, is intended to provide a model of what he calls 'experimental philosophy'. The central concern of the *Principia* is to present the dynamic 'system of the visible world' which is uniformly governed by the law of gravitation. As it has been noted, Newton developed it in conscious opposition to Descartes. He rejected the hypothetical procedure in natural philosophy taken by Descartes and his followers. As he declared, 'hypothesis, whether metaphysical or physical, whether of occult qualities or mechanical, have no place in experimental philosophy. In this philosophy particular propositions are inferred from the phenomena and afterwards rendered general by induction. Newton's famous dictum, 'hypotheses non fingo', may appear to say that the only business of his experimental philosophy is inductive generalization of particular phenomena, excluding explanation by 'physical causes' from its proper task. However, his declared renunciation of 'hypothesis' and adherence to inductive method does not necessarily mean that he thinks natural philosophy should keep within the purely quantitative description of observable phenomena by employment of mathematical device. As it was briefly mentioned before, Newton's dismissal of hypothesis is embedded in the contexts in which he reacts to Cartesians, i.e.  

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65 'Conclusio' of the *Principia*, reprinted in R.A. Hall and M. Boas Hall, *Unpublished Scientific Papers of Isaac Newton: A Selection from the Portsmouth Papers in the University Library*, Cambridge, Cambridge, 1962. Newton's program of natural philosophy is supposed to proceed from the study of the 'greater motions' of the *visible* world to that of the minute particulate motions of the *invisible* world. Newton conjectures that various kinds of natural forces other than 'gravity', 'magnetism' and 'electricity', which are *kinds of attractive forces* discoverable in the visible world, might be found at work in the world of small particles. The subject of the *Principia* is to establish the existence of gravitational force as the *universal* principle of the 'greater motions' of the visible world and deduce the law by which it works from observable motions on the earth and in heaven.


67 *The Mathematical Principles of Natural Philosophy*, p.392. For a review of Newton's attitude to hypothesis throughout his career, see Florian Cajori's discussion on Newton's use of hypothesis in n.55 to his revised translation of the *Principia* (University of California Press, 1962, pp.671-6).
to their charge of reviving occult physics on the one hand and to their alleged ‘mechanical’
explanation of gravity by appeal to the vortex theory on the other. In rejection of Cartesian
explanation by hypothesized mechanical cause, Newton called for mathematical treatment of
gravitational force before setting out for such explanation. But in so doing, he just reserved causal
account of gravity for the future task of scientific enterprise.

Berkeley observed that ‘force’, ‘gravity’, and ‘attraction’ are all ‘mathematical hypotheses’, and
this means that they are ‘mathematical entities’ which have ‘no stable essence in the nature of
things’. According to him, therefore, there is no question of penetrating into the real causal structure
of dynamic properties of bodies. But for Newton, gravity is no mere mathematical entity. Thus in
the General Scholium of the Principia, after acknowledging that he has not ‘been able to discover
the cause of those properties of gravity from phenomena’, he writes: ‘to us it is enough that gravity
does really exist, and act according to the laws which we have explained, and abundantly serves to
account for all the motions of the celestial bodies, and of our sea’. As to the real existence of
gravitational force and its status as the ‘cause’ of phenomena, Newton entertained no doubt. What
Newton admitted he was uncertain about is the true nature of gravity and its ways of operation. For
him, as it was for Cartesian critics, the conception of ‘attraction’ or ‘gravity’ as action at a distance
without any intervening medium between was unacceptable. As he wrote to Richard Bentley:

That gravity should be innate, inherent, and essential to matter, so that one body may act upon another
at a distance through a vacuum without the mediation of anything else, by and through which their
action and force may be conveyed from one to another, is to me so great an absurdity, that I believe no
man who has in philosophical matters a competent faculty of thinking can ever fall into it. Gravity
must be caused by an agent acting constantly according to certain laws; but whether this agent be

68 Ibid., p.392.
material or immaterial, I have left to the consideration of my readers.\(^6^9\)

While Newton thus rejected the concept of gravity as ‘action at a distance’, he was unable to have recourse to the vortex of Cartesians. As he sees it, it is quite difficult to account for gravity within the mechanistic paradigm of ‘action by contact’. In Book 2 of the *Principia* he had demonstrated the impossibility of Cartesian conception of universe as a ‘plenum’: that there can be no resisting matter in the space between planets if the motion of planets and comets should occur in accordance with Kepler’s second and third laws\(^7^0\). Having thus exploded the hypothesis of aethereal vortex by appeal to which gravitation might be reduced to impulsive motion, he had to leave the question about the operation of gravity across vacuum space unresolved for future investigation. It is not, however, that Newton strictly abstained from speculations about the causal mechanism of gravity. In the General Scholium of the *Principia* and in the Queries of the *Optics*, he developed a bold conjecture that distant action of gravity might be carried out by an aethereal medium which, being extremely rare, penetrates all grosser bodies and fills in empty space. Unlike its Cartesian counterpart, this active aether which permeates through the universe is conjectured by Newton to be an *immaterial agent*, called ‘subtle Spirit’\(^7^1\). Thus, the production of gravitational attraction is

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\(^{70}\) See the first paragraph of the General Scholium (*The Mathematical Principles of Natural Philosophy*, p.387). Cf. Quest. 28 to the *Optics*: ‘to make way for the regular and lasting Motions of the Planets and Comets, it’s necessary to empty the Heavens of all Matter, except perhaps some very thin Vapours, Steams, or Effluvia, arising from the Atmospheres of the Earth, Planets, and Comets, and from ... an exceedingly rare Aethereal Medium’(p.368).

\(^{71}\) *The Mathematical Principles of Natural philosophy*, p.392. Newton began to develop his theory of aether in 1670s in the early unpublished papers and letters, and returns to it later in Questions 17-24 to the second (English) edition of the *Optics* (1717). The place of speculations about aether in Newton’s natural philosophy has been disputed. According to I. Bernard Cohen, Newton’s account of aether was ‘a central pillar of his system of nature’. But R.A. Hall & M.B. Hall observes that Newton always regarded his speculations about aether as no more than tentative: ‘It would be tempting, perhaps, to consider that when Newton attributed forces to material particles, he always meant that these forces were produced by an aether. But this ... was not the case; and in any event the aether-version of the particulate theory of matter as Newton developed it cannot be considered
supposed to be due to the non-mechanical operation of an active spiritual aether. Now Berkeley, before he wrote *Siris*, had shown no sympathy to Newton’s speculations about the nature and operation of gravity developed in opposition to the Cartesian rivals. For, as it is consistently repeated in *De Motu*, he disagrees with Newton on the more fundamental level than that of deciding what the true nature of gravity is; whether it is accounted for by a physical or non-physical agent, or whether it is due to mechanical or non-mechanical operations. Newton held the task of natural philosophy to be very comprehensive, seeing it as aiming to step up the scale of causes from the particulars to the most general by the method of inductive generalization and finally culminate to the contemplation of God. As he stated in the General Scholium: ‘thus much concerning God; to discourse of whom from appearances certainly belong to Natural Philosophy’. But Berkeley insisted on a clear demarcation of the realm of natural philosophy from metaphysics:

Those who derive the principle of motion from spirits mean by *spirit* either a corporeal thing or an incorporeal; if a corporeal thing, however tenuous, yet the difficulty recurs; if an incorporeal thing, however true it may be, yet it does not properly belong to physics. ...But it will be more convenient ... to distinguish between the sciences as to confine each to its own bounds; thus the natural

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72 As a matter of fact, Newton tried a number of alternative accounts about the non-mechanical active cause of gravity throughout his career. The hypothesis of ‘active aether’ was one of those alternatives. For a lucid discussion of the development of Newton’s thinking about the ‘active principle’ as the cause of gravity from the early to the later stages of his career, see Eman McMullin, *Newton on Matter and Activity*, Notre Dame, IN: University of Notre Dame Press, 1978, chapter 4. In *Siris*, Berkeley freely talks about ‘the activity and force of aethereal spirit or fire’ (e.g. S.244). But even there, he repeatedly says that such aethereal spirit really has no force and is properly to be termed as an ‘instrumental’ cause. And he observes that Newton may perhaps sometimes be thought to forget himself in his manner of speaking of physical agents’ (S.246).

73 *The Mathematical Principles of Natural philosophy by Sir Isaac Newton*, pp.391-2. Cf. Quest. 28 to the *Optics*: ‘the main Business of natural Philosophy is to argue from Phaenomena without feigning Hypotheses, and to deduce Causes from Effects, till we come to the very first Cause, which certainly is not mechanical’ (p.369).
philosopher should concern himself entirely with experiments, laws of motions, mechanical principles, and reasonings thence deduced; but if he shall advance views on other matters, let him refer them for acceptance to some superior science. For from the known laws of nature very elegant theories and mechanical devices of practical utility follow; but from the knowledge of the Author of nature Himself by far the most excellent considerations arise, but they are metaphysical, theological, and moral.

(DM.42)

Thus, in Berkeley's view, Newton misconceived the proper task of natural philosophy when he saw the task of causal explanation remaining to be done after his successful accomplishment in the Principia of the mathematical account of observable phenomena (which involves, as is observed in the above passage, the construction of 'very elegant theories' in explanation of celestial motions and the invention of 'mechanical devices of practical utility'). According to Newton, natural philosophy is in charge of explaining 'what is the first Cause, what Power he has over us, and what Benefits we receive from him', and through such contemplation on the nature of God and the 'final cause' of the universe it contributes to the advancement of moral philosophy. In De Motu, Berkeley uses 'mechanical principle' to refer not to the mechanical causes of Cartesian physics such as extension, figure, and motion by impulse, but to the three laws of motion as formulated in the Principia, taking 'mechanical' as equivalent to 'mathematical'. And introducing the strict distinction between the 'mechanical' and the 'metaphysical' principles, he intended to put forward an antithesis to Newton's too comprehensive conception of natural philosophy.

Interestingly, however, Berkeley's demarcation of the realm of mechanics from metaphysics can be taken more positively as pointing to a new conception of causal explanation. Eliminating the underlying 'efficient cause' of phenomena from the realm of mechanical science, he does not

75 Quest. 31 of the Optics (p.405).
intend to restrict the proper task of mechanics to mere inductive generalization of phenomena. In
several places in *De Motu*, Berkeley distinguishes mechanics from experimental *physics*, which
'studies the series or successions of sensible things, noting by what laws they are connected, and in
what order, what precedes as cause, and what follows as effect' (*DM*.71). Whereas physics is
concerned only with regular connections of 'apparent effects', regarding the preceding phenomena
as the 'cause' of those which succeed them; mechanics aims to identify regularity at a higher level
than observation, postulating certain 'abstract notions' as the 'axioms' which define the whole
deductive system of mechanics. Thus he states: 'besides body, figure, and motion, *even the primary
axioms of mechanical science can be called causes or mechanical principles, being regarded as the
causes of the consequences (causae consequentium)*' (Ibid.; my italics). Newton's mechanics is,
then, an axiomatic system in which the postulated three laws of motion are the 'cause' of our
understanding of phenomena, and in this sense it provides *causal explanation* of phenomena. The
notion of 'cause' thus has place not in the ontological context but *in the epistemic context*, i.e., in the

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76 As Richard Brook pointed out (Brook, *Berkeley's Philosophy of Science*, p.116), this view of
'physics' and the notion of causality can only apply to the study of impact phenomena, but not to
gravitational phenomena. It is easy to conceive impact phenomena in terms of the relation between
sensibly distinct phenomena, regarding the antecedent collision of bodies as the 'cause' of the
subsequent 'effect', i.e. motion or change of velocity in bodies. And this notion of 'cause' can be
translated into Berkeleian notion of 'natural signs'. In gravitational phenomena, however, where the
observable regularity consists in the change of velocity or acceleration which occurs in a body at
every moment in accordance with the gravitational law, there is no sensibly discernible antecedent
which is distinct from the phenomena of accelerated motion. Thus causality in the sense of
'invariably correlated but temporally distinct phenomena' is not applicable here. (The constant
presence of a body with certain mass cannot be taken as the 'cause' of acceleration in this sense,
since acceleration occurs at every moment in the attracted body while there is no correlated change
in the central gravitating body). Brook sees this point as an indication of the inadequacy of
Berkeley's treatment of 'force' in his reductionist program. But, as I argue below, since Berkeley
conceives the *mechanical* explanation of phenomena in terms of the deduction from the premised
definitions of basic terms (including 'force') and the laws of motion postulated as 'axioms', he does
not think gravitational phenomena is to be accounted for by appeal to the observable regular
correlations of distinct phenomena. Newton's mechanics is not the study of 'natural signs' which is
directly identifiable in sensory perception, but the study of the deep structure of phenomena by
reference to which we understand the diversity of phenomena as conformable to the same law.

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248
context of constructing an explanatory system of mechanics\textsuperscript{77}. Berkeley expresses this point by observing that the ‘mechanical’ explanation of phenomena ‘by cause’ is tantamount to the \textit{solution} of them ‘by rule’: ‘It is not … in fact the business of physics or mechanics to establish efficient causes, but only the rules of impulsions or attractions, and, in a word, the laws of motions, and from the established laws to assign the solution, not the efficient cause, of particular phenomena’ (DM.35; cf. DM.37: ‘In that consist the explanation and solution of phenomena and the assigning their cause, i.e. the reason why they take place’).

It is worthwhile to note that in putting forward such conception of ‘causal’ explanation, Berkeley departs from Newton’s professed inductivism and in a certain sense affirms the concept of science as directed by hypothetical method. To be sure, he never accepts the view that natural philosophy should involve physical explanation by framing hypothesis about the true causal structure which produces planetary motion. On the point that in natural philosophy there should be no place for hypothesizing about physical causes, Berkeley insists more strongly than Newton. But while Newton held that the laws of motion and the gravitational law, ‘their Truth appearing to us by Phaenomena’, are ‘manifest Qualities’\textsuperscript{78}, Berkeley held them to be hypotheses. According to him, the laws of motion are ‘proved by experiments, \textit{elaborated by reason} and rendered universal’.

\textsuperscript{77} Buchdahl seems to be suggesting this point where he observes that ‘the expression “mathematical hypothesis” … directs us to this new “centre of gravity”, the axiomatic system. … they are “foundations of knowledge” rather than “of existence”’(\textit{Metaphysics and the Philosophy of Science}, p.314). But he does not say, as I do, that this involves a new notion of causal explanation, nor does he see significant differences between \textit{De Motu} and the \textit{Principles}. In fact, Buchdahl thinks Berkeley’s position in \textit{De Motu} is continuous with his earlier view in the \textit{Principles} (p.287).

\textsuperscript{78} Newton, the \textit{Optics}, Quest. 31, p.401. In his letter to Roger Cotes (10 December 1692), Newton emphasizes that the laws of motion are not properly to be regarded as ‘hypothesis’: ‘as in geometry the word “hypothesis” is not taken in so large a sense as to include the axioms and postulates, so in experimental philosophy it is not to be taken in so large a sense as to include the first principles or axioms which I call the laws of motion. These principles are deduced from phenomena and made general by induction’. Newton, \textit{Philosophical Writings}, p.118.
In mechanical philosophy those are to be called principles, in which the whole discipline is grounded and contained, those primary laws of motions which have been proved by experiments, elaborated by reason and rendered universal. ... In mechanics ... notions are premised, i.e. definitions and first and general statements about motion from which afterwards by mathematical method conclusions more remote and less general are deduced. ... by the application of the universal theorems of mechanics, the movements of any parts of the mundane system, and the phenomena thereon depending, become known and are determined. And that is the sole mark at which the physicist must aim. (DM.36/38)

This passage most clearly shows how Berkeley conceives the nature of Newton’s mechanics. There is no doubt that Berkeley in De Motu wants to understand the method of mechanical science in terms of what we now call the hypothetico-deductive model. Newton insisted that in his experimental philosophy ‘particular propositions are inferred from the phenomena and afterwards rendered general by induction’. But in the above passage Berkeley evidently departs from the strict inductive model of mechanics: ‘in mechanics ... notions are premised’ and from them ‘afterwards by mathematical method conclusions more remote and less general are deduced’. In the deduction of particular phenomena of motion (e.g. the motion of a projectile on earth or planetary motions) from the postulated laws, certain ‘universal theorems of mechanics’, such as the parallelogram rule about the resolution and composition of force which Newton formulated in corollary 1 to the laws of motion, and the theorems concerning motion through various kinds of resisting media, play essential roles. As to the parallelogram of force, Berkeley sees it as a ‘mathematical hypothesis’ too (DM.18). The ‘mechanical explanation of phenomena’, then, is accomplished when they are ‘shown by accurate reasoning to be in agreement and connection’ (DM.37) with the laws of motion (‘axioms’) and with the law of gravitation (which Berkeley sees as a ‘universal mechanical

theorem’) by application of theorems such as the parallelogram of force.

This view of mechanical science in *De Motu* is remarkably different from the view of scientific knowledge presented in the *Principles*, where he considered the laws of nature to be rather directly derived by inductive generalization from observations of ‘a certain similitude of appearances’. According to the *De Motu* view, the laws of motion which mechanical science is concerned to formulate are not to be found as such in observable phenomena themselves, but are appropriately to be seen as an invention or construction by the understanding of man for the purpose of attaining universal knowledge of nature. Needless to say, Newton’s laws of motion are founded on, or ‘proved by’, experiments; otherwise, they would not be the laws of nature. But they are nevertheless the order which is imposed on natural phenomena by human understanding rather than the one which is straightforwardly identified as such in phenomena. We can discern such view of laws in Berkeley’s statement in the above passage of section 38, that by postulation of the laws of motion and by mathematical reasoning from them, ‘the movements of any parts of the mundane system, and the phenomena thereon depending, become known and are determined’. Alternatively, we may as well point to the passage in section 37, where, explaining the nature of explanation in mechanics, he observes that we explain phenomena by reduction of them to the ‘most simple and universal’ laws when we ‘show that each phenomenon is in constant conformity with those laws, that is, necessarily follows from those principles’ (DM.37). Although the *Principles* view of laws is more in line with Newton’s avowed repudiation of hypotheses and his inductivist ideal of science, the *De Motu* view is more conformable to Newton’s actual practice in the *Principia*.

Thus far I have been discussing how Berkeley’s distinction in *De Motu* between explanation by ‘the mechanical principles’ and that by ‘the metaphysical principles’ implies a new conception of causal explanation. Berkeley draws a strict line between explaining phenomena ‘by rules or laws’

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and explaining them ‘by true causes’, interpreting Newton’s mechanics to be solely concerned with the former by exclusion of the latter. But this does not necessarily mean that he intends to characterize mechanics as a purely descriptive science. According to his view in *De Motu*, the three laws of motion, *qua* ‘the mechanical principles’, are not ‘rendered general by induction’ from phenomena, but rather are postulated as axioms through rational elaborations of experiments, and afterwards the ‘consequences’ of these axioms (‘causes’) are proved to be ‘in connection and agreement with’ phenomena. In other words, the laws of motion are not empirical statements but ‘hypotheses’ which are only remotely connected with phenomena (via mathematical reasoning)\(^8\). Thus in *De Motu* Berkeley conceives the laws of nature to be aiming at the regularity of nature which lies deeper than the surface observational level of phenomena. While he does not think mechanics can advance knowledge of phenomena at the ontologically deeper level, i.e. by discovery of the real physical cause of them, he thinks Newton has succeeded in the attainment of the better understanding of nature at the conceptually deeper level: that is, the conceptualization of motion in terms of the three laws of motion (especially the distinction between inertial motion and accelerated motion) helps us discover the universal ‘analogy’ of nature by which every motion and natural process in the Newtonian system of the world ‘become known and are determined’. Although this does not constitute knowledge ‘by true causes’, it is nonetheless a significant way of advancing knowledge of nature and is attained through the search for a more comprehensive

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\(^8\) On the status of the laws of motion, Brook views Berkeley as holding (following Newton) that the law of inertia are ‘not (from Berkeley’s point of view) simply an implicit definition of the absence of impressed forces, but rather the “generalization” of an experimentally determined fact’ (Brook, op., cit., p.121). Lisa Downing, by contrast, thinks that according to Berkeley the laws of motion transcend simple inductive generalization and ‘their importance lies in their applicability, not in descriptive content (which Berkeley ultimately thinks they lack)’. Downing, ‘Berkeley’s Natural Philosophy and Philosophy of Science’, p.251. I think Downing is right, though Berkeley may appear in several places to be supporting Brook’s interpretation, for example in section 51 (‘experience shows that it is a primary laws of nature . . . ’). When Berkeley says the laws of motion are certain from experience, what he exactly means is that they are proved to be true by the agreement between the reasoned consequences form them and observable phenomena of motion.
general pattern of phenomena which transcends mere observable regularity.

But at this point, it is necessary to pause and consider the nature of this conceptual advancement of knowledge of nature afforded by ‘the mechanical principles’. In the above discussion, we have seen that for Berkeley in *De Motu* the laws of motion are not straightforwardly discovered by empirical generalization but that they function as the premises of a deductive system. Now it is important here to note that Berkeley holds that the construction of a hypothetico-deductive system of mechanics involves not just formal derivations of particular phenomena from the premised general laws but also the exercise of ‘understanding’ with regard to them in the light of these laws. The search for ‘the most simple and general laws’ and the subsumption of phenomena under them are not only the matter of accomplishing ‘the economy of thought’. As Berkeley observes:

The human mind delights in extending and expanding its knowledge; and for this purpose general notions and propositions have to be formed in which particular propositions and cognitions are in some way comprised, which then, and not till then, are believed to be understood. (DM.38; my italics)

In this passage we see Berkeley’s first mention of the faculty of ‘understanding’ as distinguished from ‘sense’: particular phenomena (or propositions about them), which are apprehended by sense perception, are not ‘understood’ until they are ‘in some way comprised’ in ‘general notions and propositions’. What is implied by the above passage is that for Berkeley in *De Motu* knowledge of a particular phenomenon is not complete in sense perception but needs to be developed further by the exercise of the faculty of ‘understanding’ which involves the use of general concepts. On the one hand, this is a significant departure from his earlier epistemological view. In section 87 of the *Principles*, Berkeley insisted that ‘motion’, as well as other sensible ideas, is by simple perceptual apprehension ‘perfectly known, there being nothing in them which is not perceived’. But now the
earlier view about the self-sufficiency of ‘knowledge of idea’ by sensory intuition is denied, at least in respect to ‘motion’. On the other hand, this passage is an anticipation of Berkeley’s strict distinction between ‘sense’ and ‘understanding’ in Siris, published twenty three years after De Motu. As we will see in the next section, in Siris he goes so far as to claim that knowledge of phenomena is attained solely by ‘the understanding’, not by sense perception.

Thus, although Berkeley thinks the laws of motion are not ‘manifest qualities’ of observable motions but are ‘hypotheses’ which are only indirectly shown to agree with them, they nonetheless afford us the better understanding of observable motions. The advancement of our knowledge of nature by formulation of the laws of motion and the construction of an axiomatic system defined by them involves not only the improvement of calculating instrument but the significant advancement of our understanding of the true structure of phenomena which underlies the pervasive uniformity of the natural world. Now this interpretation will appear to be conflicting with the traditional view of Berkeley as an early champion of ‘instrumentalism’. In one of the earliest discussion on Berkeley’s philosophy of science in the literature, Karl Popper ascribed to him instrumentalism on the ground that he sees dynamical concepts such as ‘force’ to be ‘mathematical hypotheses’.

A mathematical hypothesis may be described as a procedure for calculating certain results. It is a mere formalism, a mathematical tool or instrument, comparable to a calculating machine. It is judged merely by its efficiency. It is not only admissible, but it may be admirably useful. But, as opposed to the explanation by essences (which, in mechanics, are simply false) and to that by laws of nature (which are, if the laws ‘have been proved by experiment’, simply true), the question of the truth of a mathematical hypothesis does not arise – only that of its usefulness as a calculating tool.\(^82\)

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Here it is noticeable that the instrumentalist position is ascribed to Berkeley only with respect to dynamical concepts, not with respect to the laws of nature. In fact, Popper interprets Berkeley's 'mechanical principles' as comprised of empirical statements: Newton's laws of motion 'simply describe the observable regularities of the motion of bodies'; therefore, they are 'simply true'. By contrast, the dynamical concepts used in mechanics are properly to be conceived as 'a calculating machine'. Standing on this interpretation, Popper criticized Berkeley for his 'failure to realise the hypothetical character of what he calls the laws of nature'. But, as we have seen, Berkeley actually thinks the laws of motion qua 'mechanical principles' are the premises of the hypothetico-deductive system of mechanical science: they are not directly confirmed by observable regularities, but are proved by reasoning to be 'in connection and agreement with' them.

Popper's interpretation of Berkeley as an instrumentalist about dynamical concepts but not about the laws of nature seems strange, because Berkeley states that terms like 'force' and 'gravity' are useful not only for calculation but for 'theories and formulations'. Berkeley never denies that the concept of 'force' (or 'action'/reaction) is indispensable to the formulation of the laws of motion or that the concept of 'gravity' is useful to the discovery of the law of gravitation. For him, the laws of motion and the law of gravitation which is derived from the application of the laws of motion to Kepler's laws of planetary motion, have a hypothetical status, just as dynamical concepts which play an essential role in the formulation of these laws do. But this does not mean that he takes the laws of Newton's mechanics as 'a mere formalism comparable to a calculating machine'. For it is clear that Berkeley thinks the question of the truth are relevant to their formulation. As we

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83 Popper, Ibid., p.29.
84 Ibid., p.35.
see in the passage below, he does not cleanly separate the truth of the laws from their usefulness.

... in mechanical philosophy the truth and the use of theorems about the mutual attraction of bodies remain firm (stables manent), as founded solely in the motion of bodies, whether that motion be supposed to be caused by the action of bodies mutually attracting each other, or by the action of some agent different from the bodies, impelling and controlling them. Similarly the traditional formulations of rules and laws of motions ... remain unshaken, provided that sensible effects and the reasonings grounded in them are granted, whether we suppose the action itself or the force that causes these effects to be in the body or in the incorporeal agent. (DM.28; my italics)

Here Berkeley speaks of the understanding of motion by the laws (the laws of motion and the law of gravitation) which remains ‘firm’ and compares it with the attempt to understand motion by the true efficient cause which remains uncertain. As he repeatedly observes in De Motu, explanation by efficient causality belongs to the realm of ‘metaphysics’, and ‘only by meditation and reasoning can truly active causes be rescued from the surrounding darkness and be to some extent known’ (DM.72). But explanation of the motion of bodies by the laws can nonetheless be considered to be true, whether its true efficient cause will be discovered or remain unknown.

4. Knowledge and the activity of the mind: the Sense/Understanding distinction in Siris

In this section I explore the implication of the development of Berkeley’s theory of knowledge of nature in the middle period for his later theory of knowledge and cognitive faculty, which is expressed in his last major work, Siris, and conclude this treatise by clarification of the place and significance of ‘relations’ in Berkeley’s mature theory of knowledge.
Towards the last period, there emerges a tendency in Berkeley's thinking about knowledge to put emphasis on the hierarchical order between the faculties of man, distinguishing their different values in the formation of knowledge\textsuperscript{85}. As it has been well recognized by scholars, \textit{Siris} is conspicuous for its Platonic influence. In the negative sphere, this is manifested in the consistent denigration of the significance of \textit{sense} in the acquisition of knowledge throughout this work. And, needless to say, this negative evaluation of sense is coordinated with the appraisal of the higher intellectual faculties distinct from sense, which Berkeley now regards as the proper office of knowledge. In an oft-quoted passage, he gives a forceful expression to this Platonic line of thought:

Sense at first besets and overbears the mind. The sensible appearances are all in all: our reasonings are employed about them; our desires terminate in them; we look no farther for realities or causes; till intellect begins to dawn, and cast a ray on this shadowy scene. We then perceive the true principle of unity, identity, and existence. Those things that before seemed to constitute the whole of being, upon taking an intellectual view of things, prove to be but fleeting phantoms. (S.294)

In this and many other sections, Berkeley mentions the distinction between the higher and the lower faculties of the mind and unhesitatingly declares the superiority of 'intellect' over 'sense'. In \textit{Siris}, unlike in his earlier works such as the \textit{Principles} and the \textit{Three Dialogues}, he denies 'sensible appearances' the status of true and real existence. As he repeatedly observes by reference to Plato,

\textsuperscript{85} It is true, however, that Berkeley expressed the idea of the hierarchy between cognitive faculties from very early on: it indeed goes back to as early as 1713. In one of the Guardian Essays, no. 62, he speaks of 'the culture of our minds' as well as the refinement of pleasures which corresponds to the different stages of the mind's culture: 'As our parts open and display by gentle degrees, we rise from the gratifications of sense to relish those of the mind. In the scale of pleasure, the lowest are sensual delights, which are succeeded by the more enlarged views and gay portraiture of a lively imagination; and these give way to the sublimer pleasures of reason, which discover the causes and designs, the frame, connexion, and symmetry of things, and fills the mind with the contemplation of intellectual beauty, order, and truth'. \textit{Works}, VII, p.203.
their nature and existence is uncertain, ever fleeting and changing’, and so ‘they do not in strict truth exist at all’; accordingly, they ‘cannot be subjects of science, much less of intellectual knowledge’ (S.304/335). By contrast to this, Berkeley affirms that ‘intellectual ideas’ are ‘the most real beings’ and hence are the object of intellectual knowledge (S.335-6). ‘Idea’ in his earlier works was ‘an inert inactive object of the understanding’ (S.335), but he now uses it in the authentic Platonic sense. The central theme of the last sections of *Siris* is the mind’s ‘ascent’ to divine ideas and the intellectual knowledge of God: ‘By experiments of sense we become acquainted with the lower faculties of the soul; and from them, whether by a gradual evolution or ascent, we arrive at the highest. …In this scale, each lower faculty is a step that leads to one above it. And the uppermost naturally leads to the Deity, which is rather the object of intellectual knowledge than even of the discursive faculty, not to mention the sensitive’ (S.303).

Here I will not be concerned with Berkeley’s theory of ‘intellect’ in *Siris*. My chief concern is rather to pay attention to another important development in Berkeley’s theory of cognitive faculty which has not been sufficiently recognized in the literature, namely, his view of the ‘understanding’ as the intermediate faculty which is placed between ‘sense’ and ‘intellect’. Admittedly, his mention of the ‘understanding’ is not frequent in *Siris*, but what he briefly suggests in several sections in this connection is worth exploring. Particularly interesting is that his remarks on this intermediate faculty of ‘understanding’ appears in close connection with his thesis of ‘the language of nature’.

80 But he sometimes tries to go back to his earlier terminology by using ‘ideas’ for passive objects of sense and ‘notion’ for the objects of intellectual knowledge: ‘Some, perhaps, may think the truth to be this – that there are properly no ideas, or passive objects, in the mind but what were derived from sense: but that there are also besides these her own acts or operations; such are notions’ (S.308). Berkeley’s talk about ‘intellect’ in *Siris* is not necessarily volte-face. In the notebooks, he did not deny that we may know our own mind and its ‘operations’ by ‘pure intellect’ (PC.531). While his official account in the published writings is that we know our own mind ‘by inward feeling or reflexion’ (PHK.89/ DHP.233)), in one passage of the *Three Dialogues*, he suggests that we may know by ‘pure intellect’ such ‘spiritual objects’ as ‘virtue, reason, God, or the like’ (DHP.194); and in *De Motu* as well, he states that pure intellect is ‘concerned only with spiritual and inextended things, such as our minds, their states, passions, virtues, and such like’ (DM.53).
The passages of particular importance are found in sections 252-4, at which we are now going to take a close look. Berkeley presents the distinction of ‘understanding’ from ‘sense’ in this way.

We know a thing when we understand it; and we understand it when we can interpret or tell what it signifies. Strictly, the sense knows nothing. We perceive indeed sounds by hearing, and characters by sight; but we are not therefore said to understand them. After the same manner the phenomena of nature are alike visible to all; but all have not alike learned the connexion of natural things, or understand what they signify, or know how to vaticinate by them. (S.253)

What is striking about this passage, when we compare it with his view in the earlier works, is that Berkeley insists on the function of ‘understanding’ distinct from sense, allowing the knowledge producing power to the former but not to the latter. Earlier in the *Principles*, describing the cognitive faculty of the mind, he stated that ‘as it perceives ideas, it is called the understanding’ (PHK.27). And since ‘perception’ in the *Principles* was epistemic, it should follow that it was his view that the ‘understanding’ knows sensible ideas by perceiving them. In the earlier works, Berkeley was not interested in drawing strict distinction between ‘understanding’ and ‘sense’, and he clearly held that knowledge belonged to the faculty of ‘sense’.

But in *Siris*, we are now told, the ‘understanding’ knows without perceiving anything; by contrast, the ‘sense’ perceives but knows nothing. What the sense perceives are ‘sensible appearances’ (termed ‘ideas of sense’ in his earlier works), which Berkeley likens to the ‘sounds’ and ‘characters’ of language. The objects of

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87 In the *New Theory*, Berkeley states that ‘I take the word idea for any the immediate object of sense or understanding’ (NTVA5; my italics). In the *Introduction* to the *Principles*, he remarks that he can have clear and adequate knowledge by ‘an attentive perception of what passes in [his] own understanding [i.e. ‘ideas’]’ (Pl.22). If we combine these statements with the opening section of the *Principles*, where he considers ideas of sense and imagination as objects of knowledge, Berkeley held in the early period: 1) that ‘ideas’ are objects of knowledge, 2) that ‘ideas’ are known by ‘perception’, 3) that there is no difference between the ‘sense’ and the ‘understanding’ considered as the knowledge producing faculty. In *Siris*, Berkeley abandons all of these three points.
‘understanding’, on the other hand, are the *sign-signified connections* of those sensible appearances. As mere perception of ‘sounds’ and ‘characters’ is not properly to be considered as knowledge, so the sense-perception of elementary sensible appearances does not amount to knowledge. It is only when we *understand the signification* of those sensory elements (and this involves the process of ‘interpreting’ which is more than ‘perceiving’) that we are said to have *knowledge*.

Now, the point which deserves attention is that Berkeley’s strict distinction of ‘understanding’ from ‘sense’ in *Siris* is strongly motivated by his desire to differentiate knowledge from mere ‘perception’. In *Siris*, Berkeley regards perception as the *passive* state of the mind, and knowledge, which is attained to by the exercise of understanding, involves *activity*. We can see this underlying motivation in the following passage which is as striking as the previously quoted one:

> As understanding perceiveth not that is. doth not hear, or see, or feel, so sense knoweth not: and although the mind may use both sense and fancy, as means whereby to arrive at knowledge, yet sense, or soul so far forth as sensitive, knoweth nothing. For, as it is rightly observed in the *Theaetetus* of Plato, science consists not in the passive perceptions, but in the reasoning upon them. (S.305)

The ‘understanding’, as the ‘higher’ faculty of knowledge, is the *active* function of the mind: it involves *reasoning* as distinguished from ‘passive perceptions’; or, as it is said in section 303 quoted before, it is ‘the discursive faculty’ which is placed above the ‘sensitive’. And we should also note that Berkeley considers ‘science’ to properly belong to the ‘understanding’ which is characterized as the faculty of active reasoning. But we now need to consider the interconnection between this conception of ‘understanding’ and the thesis of ‘the language of nature’: how should we interpret these characterizations of ‘understanding’ as *active* and *as the faculty of scientific knowledge* in connection with Berkeley’s view that nature constitutes ‘language’?
The sense/understanding distinction and ‘the language of nature’ are combined in section 254:

As the natural connexion of signs with the things signified is regular and constant, it forms a sort of rational discourse, and is therefore the immediate effect of an intelligent cause… the phenomena of nature, which strike on the senses and are understood by the mind, form not only a magnificent spectacle, but also a most coherent, entertaining, and instructive Discourse; and to effect this, they are conducted, adjusted, and ranged by the greatest wisdom. This Language or Discourse is studied with different attention, and interpreted with different degrees of skill. But so far as men have studied and remarked its rules, and can interpret right, so far they may be said to be knowing in nature. A beast is like a man who hears a strange tongue but understands nothing. (S.254; my italics)

This passage displays Berkeley’s clearest and most considered view about the relationship between the language model of nature and his theory of mind and knowledge. What is particularly noteworthy is the explicit statement that the mind’s reading of the divine ‘Language or Discourse’ requires the complex mental exercises distinct from straightforward sense-perceptions: in order for us to read natural signs of divine institution, we need not only to sense-perceive but to understand. The ‘understanding’ of natural signs involves the identification of ‘general rules’ by the exercise of ‘attention’ and ‘skill’. This reminds us of the art of ‘the grammar of nature’ which was said to be the chief concern of natural philosophers in the Principles, and we find the same point repeated in Siris: ‘There are certain analogy, constancy, and uniformity in the phenomena or appearances of nature, which are a foundation for general rules: and these are a grammar for the understanding of nature, or that series of effects in the visible world whereby we are enabled to foresee what will come to pass in the natural course of things’ (S.252). But Berkeley’s conception of ‘the grammar of nature’ in Siris is not just rehearsing his earlier thought in the Principles. It should be interpreted, I
want to suggest, by taking into account the development of his thought we have seen in this chapter in the middle period works, *De Motu* and *Alciphron*.

In my estimation, the development of Berkeley’s thought in his conception of natural grammar in the middle period, his differentiation of the ‘understanding’ from the ‘sense’, and his conception of knowledge as the mind’s activity, are combined together in the distinctive position in *Siris* that knowledge by ‘understanding’ has the intermediate status in the mind’s ascending the scale of knowledge from ‘sensible appearances’ up to ‘intellectual ideas’. Berkeley holds in *Siris* that perceptual apprehension of ‘sensible appearances’ which belongs to the function of ‘sense’ never amounts to knowledge. Knowledge is acquired only through an interpretative activity of the objects perceived by the senses, and such interpretative activity is the function of the ‘understanding’.

Drawing on discussions in the foregoing sections of this chapter, then, I suggest that this faculty of the ‘understanding’ which actively interprets natural signs is the faculty of symbolic representation for Berkeley. As we saw, Berkeley recognized in *Alciphron* the essential role of artificial signs in the formation of scientific knowledge. The characteristic feature of sciences consists in substitution of ideas or things by symbolic thoughts: scientific studies deal with particular sensible objects by construction of a symbolic system defined by general rules and thus enables us to act systematically and effectively with regard to the world of sensible things. And this symbolic system of science, as we saw in section 2 of this chapter, plays heuristic roles in the advancement of sciences: the use of symbols not only helps us in the practical sphere of conducting actions in the real world but also in the theoretical sphere by providing us with the groundwork for the further refinement of scientific theories and the formulation of new general rules. Thus, Berkeley’s concept of the ‘understanding’ as distinct from passive sense-perceptions stemmed from his view developed in the middle-period about the nature of scientific knowledge: by inventive construction of a symbolic system, it enables us to regulate our thought and actions by general rules.
As I have briefly mentioned in section 3, the sense/understanding distinction which is clearly put forward in *Siris* of 1744 can be traced back to as early as *De Motu* of 1721. The constant motif in Berkeley’s interpretation of Newton’s mechanics is that the proper concern of mechanical science is not to discover the efficient physical cause but to identify the regularity of phenomena. But what is remarkable of Berkeley’s mature position in *De Motu*, which is different from his position in the *Principles*, is that he avoids equating the regularity of phenomena with the regularity which is discoverable at the surface observational level. That is to say, mechanics aims to identify the regularity of phenomena which is not observable similitude, premising ‘abstract notions’ and thereby postulating the ‘axioms’ which define the deductive system of mechanics. The abstract notions used in mechanics are the concepts of mass and force (with the distinction of ‘innate’ and ‘impressed’) as they are defined in Newton’s *Principia*, and the primary axioms are the three laws of motion formulated after the definition of force. As I have argued in section 3, Berkeley entertains a new conception of ‘causal’ explanation in *De Motu*. While mechanics is not concerned with explanation by true efficient cause, it is still concerned with explanation by the mechanical ‘cause’ in some qualified sense: it deduces by mathematical reasoning consequences from the postulated axioms or general laws of motion and explains particular phenomena by showing that they are in agreement with the deduced consequences of the postulated laws. Thus, although the laws of motion (and physical force) are not the ontological principle of kinematic phenomena, they are properly the epistemological principle by which we understand the particular motions which occurs in the mundane system. In this hypothetico-deductive image of mechanical science, the postulated laws or rules of motion, which natural philosophers hypothesize for the ‘solution’ of kinematic phenomena, are said to be the ‘cause’ of our understanding of phenomena.

The important point to note is that these laws of motion are (contrary to Popper’s interpretation) not mere empirical generalization for Berkeley. Rather, they are hypotheses which do not directly
correspond to observable phenomena, and on this point Berkeley clearly departs from Newton’s official statement (in the Optics) that the laws of motion are *manifest from phenomena*. But here we should consider the striking implication this position has for his early view of knowledge of nature. In the Principles, Berkeley attributed the knowledge producing power to the senses, stating that motion, ‘considered only as so many sensations in the mind, are perfectly known’ (PHK.87). But ten years later, in De Motu, the cause of our understanding motions is not the perception of them by the senses, but the general laws which are identifiable only through rational elaboration of sensory perceptions. It is natural, then, to interpret Berkeley’s remark in Siris that natural phenomena ‘strike on the senses’ but ‘are understood by the mind’ in light of his account of the nature of mechanics in De Motu. In the previous section I quoted the passage from section 38 of De Motu, which states that ‘particular propositions and cognitions’ about motion are understood only when they are ‘in some way comprised’ in ‘general notions and propositions’. What Berkeley has particularly in mind by the ‘general notions and propositions’ which comprise particular phenomena of motion are, it should be clear, the fundamental laws of motion and the law of gravitation which is mathematically deduced from those fundamental laws; and these laws advance our understanding of particular motions in that they afford us to grasp the uniformity of nature which *lies deeper than the surface observational level* of phenomena. The laws of motion and the law of gravitation which define Newton’s mechanical system bring us to the better understanding of phenomenal motion at the *conceptually deeper* level. These laws are, in Berkeley’s considered view, the *expressions of the universal analogy* by which every motion and every natural process of the mundane system ‘become known and are determined’. It is from such perspective that Berkeley refers to Newton’s Principia as ‘the best key for analogy, or natural science’ (PHK.109; second ed.); and he continues his praise in Siris with the remark that ‘Sir Isaac Newton hath cast a new light on natural science’ and ‘as with a key opened several *deep secrets* of nature’ (S.245; my italics).
Now the hierarchical order of human faculties and the thesis of the mind's gradual ascending from sensory perceptions to universal notions have sources in the traditional epistemology, as Berkeley freely exploits them in *Siris*. But I would rather underline the distinctive Berkeleian stamp on the ancient doctrine of 'the scale of knowledge' by pointing to the linkage with his concept of 'symbolic substitution' developed in *Alciphron*. In the preceding two paragraphs I drew attention to the connection between the sense/understanding distinction in *Siris* and Berkeley's view of mechanical laws as the epistemological principles, i.e. the 'cause' of our understanding motions. In my view, this connection is to be illuminated by Berkeley's middle-period view of science that it essentially depends on the use of artificial symbolic device. Here let us look again at the crucial passage in *Alciphron* which I quoted earlier in section 1.2 of this chapter.

... all sciences, so far as they are universal and demonstrable by human reason, will be found conversant about signs as their immediate object, though these in the application are referred to things. The reason whereof is not difficult to conceive. For, as the mind is better acquainted with some sort of objects, which are earlier offered to it, strike it more sensibly, or are more easily comprehended than others, it seems naturally led to substitute these objects for such as are more subtile, fleeting, or difficult to conceive. Nothing, I say, is more natural than to make the things we know a step towards those we do not know; and to explain and represent things less familiar by others which are more so.

(ALC.VII-13)

This passage is located in the long section which concludes Euphranor's discussion of 'the doctrine of signs' in the seventh dialogue. Now from the viewpoint of *Siris*, it is clear that this section in *Alciphron* not only anticipates Berkeley's return to the ancient doctrine of 'the scale of knowledge' but gives a peculiar Berkeleian flavour to it. According to my interpretation of the *Siris* distinction
of ‘understanding’ and ‘sense’, we ascend from perception of motions to universal knowledge of
them through the interpretative exercise of the ‘understanding’, by subsumption of particular
phenomenal motions under the universal analogy which is not manifest to the senses but lies deeper
than the surface observational level. But this exercise of the ‘understanding’ which transcends
sensible particulars towards universal knowledge necessarily involves the ‘apt choice and skilful
management of signs’, as Euphranor put it. The ‘substitution’ of things by symbols is indispensable
in science, since universal analogy is not manifest there in sensible appearances: it is necessary that
we make the analogy fixed before the understanding by symbols which are, taken by themselves,
are sensible. It is by the representing capacity of sensible signs that the insensible analogy of things
becomes comprehensible. Thus the ‘understanding’, as the ‘higher’ faculty which is capable of
scientific knowledge, is properly the faculty of symbolic representation.

But what, after all, is the ‘universal analogy’ of things which is only understood without being
perceived by sense and which, according to my interpretation, is comprehensible only through
symbolic representation? If it is a universal notion which the mind endeavours to attain by
departure from sensory impressions, its status in Berkeley’s system may appear problematic. Is it
not abstraction from the objects of sensory perception which he so vehemently attacked in his early
philosophical works? This should bring us back to the question about the ‘notion of relations’
which Berkeley introduced to his system in the second edition of the Principles. Towards the end of
chapter 1, I suggested, through discussion of Johnston’s interpretation, that the third-kind object of
knowledge, ‘relations’, is to be located at the intersection of ‘the doctrine of signs’ and ‘the doctrine
of notions’. As it has been discussed there, the interconnection between ‘relations’ and Berkeley’s
‘doctrine of notions’ is indicated by the passages added to sections 89 and 142 of the second edition
of the Principles. Drawing on these passages, G.A. Johnston concluded that Berkeley’s ‘doctrine of
notions’ amounts to what he calls the theory of ‘universal knowledge of spirits’; to have ‘a notion of’
relations', for Berkeley, is to have direct awareness of the acts of the mind – the mental acts, presumably, of 'relating' which function as universals. According to this interpretation, a universal notion is simply to be equated with a mental act of 'relating', and the question about 'relations' in Berkeley's system is solved by assigning its place in the category of 'spirit'. If we apply Johnston's interpretation of Berkeley's 'notion of relations' to the sense/understanding distinction in Siris, then, the 'universal analogy' of things will be mental acts of 'relating', and the 'understanding' of the analogy will be a kind of the mind's reflexive awareness of its own acts.

Now the thesis that a notion of relation is a mental act, which is implied by the passage in section 142 of the Principles that relations 'include an act of the mind', seems to be reaffirmed in several sections of Siris. We saw in chapter 3 that Berkeley considers knowledge of number to be 'knowledge of relations'. In Siris, however, he observes: 'Number is no object of sense. It is an act of the mind (S.288; my italics). Furthermore, in section 308, he remarks that 'there are properly no ideas, or passive objects, in the mind but what were derived from sense: but that there are also besides these her own acts or operations; such are notions' (my italics). These passages can be taken as strongly supporting Johnston's interpretation. More strikingly, Berkeley connects this thesis about 'notions' as the mind's acts to the motif of the mind's ascent to the intellectual realm:

The mind, her acts and faculties, furnish a new and distinct class of objects, from contemplation whereof arise certain other notions, principles, verities, so remote from, and even repugnant to, the first prejudices which surprise the sense of mankind … (S.297; my italics)

Thus the mind's 'ascent' from sensory appearances to universal notions involves the process of self-reflection on the acts or operations which the mind performs with regard to sensible objects – the acts of 'relating' them. And the 'universal analogy' of things as the object of the 'understanding'.
if we take these sections of *Siris* seriously, is to be identified with the mind’s awareness of its own activity. The thesis that the notions of relations are the self-reflexive mental acts certainly fit well with Berkeley’s view in *Siris* that knowledge consists not in passive perceptions but in the active reasoning of the mind. The characteristic view Berkeley endorses in *Siris* with his thesis of universal notions as the mental acts of ‘relating’, then, is that the object of knowledge – the analogy of natural phenomena – and the mental activity which produces the knowledge – the understanding as distinct from sense perception – are one and the same.

However, I have argued in chapter 1 that Johnston’s interpretation of the ‘notion of relations’ is inadequate. The discussion of this last chapter has been aiming to elaborate it by putting emphasis on the significance of the motif of ‘symbolic substitution’ for interpretation of ‘relations’. It is not that I deny that the notion of relations involves mental activity of ‘relating’; this is indeed hard to deny if we take seriously the texts of the *Principles* and *Siris*. But my point is that Berkeley thinks we know ‘relations’ through symbolic representations: as such, notional knowledge of relations should always be indirect. The ‘notion of relations’ involves the mind’s reflexive awareness, but it is mediated by the use of symbols. This is equally undeniable, I think, from the texts of *Alciphron* which Berkeley inserted to the third edition of 1752 (published eight years after *Siris*). One of those texts stated that ‘signs … in their use imply relations or proportions of things; but these relations are … founded in particular things, and are not making of themselves distinct ideas to the mind, exclusive of the particular ideas and signs’ (ALC.VII-12). Johnston missed the close connection between Berkeley’s ‘relations’ and his view of scientific knowledge as mediated by symbols. As I have suggested earlier in chapter 1, this is related to the point that to have ‘a notion of relations’ according to Berkeley is not just a matter of reflexive mental awareness but involves the regulation of actions by ‘general rules’. Berkeley makes this point sufficiently clear through Euphranor’s observation in *Alciphron* (another passage inserted to the third edition) that ‘relations, habits, or
proportions, as they cannot be by us understood but by the help of signs, so being expressed and computed, they direct and enable us to act with regard to things’ (Alc.VII-14).

In the development of his thought from the early to the middle period, Berkeley had been trying to accommodate universals in his system of knowledge. The position Berkeley finally reached about the status of universal knowledge is not to locate it in the mental acts of relating things; nor does he simply identify it with the possession of symbols or the exercise of symbolic operations. Rather, Berkeley holds that universal knowledge consists in the mind’s ability to regulate its actions with regard to the world by ‘general rules’; and since the formulation of ‘general rules’ is effected by the inventive use of symbols, as it is clear in the case of sciences, universal knowledge should involve the ‘substitution’ of things by symbols. The place of universals, that is, ‘relations’ or analogies of nature, in Berkeley’s system of knowledge, is not simply to be located on the side of the mind nor on the side of the world. The general laws of nature which we regard as the principles for understanding the natural world express the analogies of nature, but the analogies are not out there in the world independent of the mind’s relationship with the world. Analogies only emerge in the natural world as we develop the ability of symbolic representation which enables us to regulate actions by general rules. Universals are, then, to be located in the general state of harmony or concurrence between the mind and the course of nature, or in the mind’s successful adaptation to the natural world. Sensible things are ‘in a perpetual flux, without anything stable or permanent in them to constitute an object of real science’ (S.304). But the mind’s ability to act with regard to sensible things, insofar as it is regulated by general rules, is stable and permanent, and therefore constitutes science. The universal notions to which the mind turns by departure from ‘passive perception’ are, therefore, the mind’s concurrent acts with the course of nature. Through the reflexive awareness of its harmonious operations on nature, the mind is furnished with ‘a new and distinctive class of objects’, as is stated in section 297 above. This self-reflexive act of the mind is
the 'understanding' in which the act of knowing and the object known is the same, and this is what Berkeley termed 'a notion of relations' in the second edition of the *Principles*. But for Berkeley in *Siris*, of course, such 'notion of relations' is only intermediate knowledge which ultimately leads to the yet higher realm of knowledge about the source of stability, harmony, and order, as he writes by reference to Plato: 'Light and sight (saith Plato in the sixth book of his *Republic*) are not the sun: even so truth and knowledge are not the Good itself, although they approach thereunto. And again, what the sun is in a visible Place with respect to sight and things seen, that same is ὑγιέων or Good in an intelligible place with respect to understanding and thing understood. Therefore the Good or One is not the light that enlightens, but the source of that light' (S.343).
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