

The Cambridge Companion to
**EARLY MODERN
PHILOSOPHY**

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CONTENTS

	<i>page</i>
<i>List of figures</i>	ix
<i>Notes on contributors</i>	x
<i>Preface</i>	xiii
<i>List of abbreviations</i>	xiv
Introduction	
DONALD RUTHERFORD	I
1 Innovation and orthodoxy in early modern philosophy	
DONALD RUTHERFORD	II
2 Knowledge, evidence, and method	
STEPHEN GAUKROGER	39
3 From natural philosophy to natural science	
DENNIS DES CHENE	67
4 Metaphysics	
NICHOLAS JOLLEY	95
5 The science of mind	
TAD SCHMALTZ	136
6 Language and logic	
MICHAEL LOSONSKY	170
7 The passions and the good life	
SUSAN JAMES	198

8	The foundations of morality: virtue, law, and obligation	
	STEPHEN DARWALL	221
9	Theories of the state	
	A. JOHN SIMMONS	250
10	Theology and the God of the philosophers	
	THOMAS M. LENNON	274
11	Scholastic schools and early modern philosophy	
	M. W. F. STONE	299
12	Toward enlightenment: Kant and the sources of darkness	
	J. B. SCHNEEWIND	328
	<i>Short biographies of major early modern philosophers</i>	353
	<i>Bibliography</i>	365
	<i>Index</i>	401

Introduction

The seventeenth and eighteenth centuries have long been recognized as an especially fruitful period in the history of Western philosophy. Most often this has been associated with the achievements of a handful of great thinkers: the so-called “rationalists” (Descartes, Spinoza, Leibniz) and “empiricists” (Locke, Berkeley, Hume), whose inquiries culminate in Kant’s “Critical philosophy.”¹ These canonical figures have been celebrated for the depth and rigor of their treatments of perennial philosophical questions, concerning, for example, existence, modality, causality, knowledge, obligation, and sovereignty, as well as for their efforts to push philosophy in new directions, challenging many of the assumptions of ancient and medieval philosophy. In this connection, it has been argued that epistemology assumes a new significance in the early modern period as philosophers strive to define the conditions and limits of human knowledge. Yet early modern philosophers make major contributions in almost every area of philosophy, and in many cases their conclusions continue to serve as starting points for present-day debates. The chapters in this *Companion* are designed to acquaint the reader with the most important developments in early modern philosophy and to point the way toward more advanced studies in the field.

THE NEW HISTORY OF EARLY MODERN PHILOSOPHY

Few would challenge the notion that the early modern period is a rich and even revolutionary era in the history of philosophy. Nevertheless, scholarship published during the last thirty years has led to a revision in our conception of the scope and significance of early

modern philosophy. Four developments are noteworthy, all of them associated with an increased emphasis on a contextualized understanding of the practice of philosophy and of the knowledge it produces.

First, historians have challenged the assumption that early modern philosophy can be adequately comprehended in terms of the major published works of its most famous figures. It is now a commonplace that to understand a philosopher's views – expressed in the well-honed sentences of a book such as Descartes's *Meditations* or Kant's *Critique of Pure Reason* – requires understanding them in relation to the entire corpus of the philosopher's writings, published and unpublished. Correspondences, preliminary drafts, and subsequent revisions of published texts are all seen as important sources of evidence. In addition, it is increasingly acknowledged that our understanding of a canonical text can be deepened by reading it in conjunction with the works of a philosopher's immediate predecessors and contemporaries – works that often supply an illuminating background for its interpretation.² In short, even if a published treatise carries an imprimatur as the authoritative expression of a philosopher's position on a given topic, understanding that position often is facilitated, and sometimes is only possible, by relating it to other pieces of textual evidence.

A second and more profound challenge has targeted the privileged status accorded to the philosophers making up the traditional canon of early modern philosophy. In recent years, the cast of leading characters has expanded to include an array of figures who are significant thinkers in their own right and whose thought intersects at vital points with that of the canonical seven. These figures include Michel de Montaigne, Francisco Suárez, Hugo Grotius, Francis Bacon, Pierre Gassendi, Thomas Hobbes, Henry More, Ralph Cudworth, Anne Conway, Antoine Arnauld, Nicolas Malebranche, Blaise Pascal, Pierre Bayle, Samuel Pufendorf, Francis Hutcheson, Thomas Reid, Adam Smith, Jean-Jacques Rousseau, and Christian Wolff – to mention only some of the authors whose writings have been subject to intensive analysis in the secondary literature. By attending to their works, historians have arrived at fuller and more nuanced accounts of philosophy's development in the early modern period.

One result of these efforts to map more accurately the landscape of early modern philosophy has been a growing skepticism concerning traditional interpretative categories (e.g. “rationalist” versus “empiricist”). Such dichotomies have been criticized as inadequate for understanding the relationships among the views of early modern philosophers. Moreover, they have tended to reflect a bias in the history of philosophy toward epistemology and metaphysics and away from ethics, political philosophy, and theology. Recent scholarship has sought to counter this bias both through detailed studies of the practical philosophy of the early modern period, and through studies that aim to deliver a synoptic picture of the views of particular thinkers, emphasizing the close connections between, for example, metaphysical theories and ethical theories.³

Finally, the development of early modern philosophy increasingly has been recognized to be inseparable from, and in many cases dependent upon, a larger set of intellectual and cultural changes, which include the emergence of modern natural science, theological conflicts within and between the Catholic and Protestant churches, and the movement toward the modern nation-state. Within the early modern period, philosophy retains a distinct identity as a discipline whose concerns are continuous with those of ancient and medieval philosophy, on the one hand, and later modern philosophy, on the other. What the new history of early modern philosophy has stressed, however, is that abstract philosophical problems acquire a determinate content within a specific intellectual context – one that must be appreciated in order to understand the theories and arguments of the philosophers in question. In most cases one finds no sharp line dividing philosophical debates concerning, for example, the nature of matter or freedom of the will, and related debates in physics or theology. Thus, again, one is forced to take a more expansive view of the relevant textual evidence than previously was common in the history of philosophy.

The present volume reflects these priorities of the new history of early modern philosophy. Its focus is the changing shape of philosophical inquiry in the early modern period, with emphasis placed on the transformation of concepts and doctrines inherited from ancient and medieval philosophy and the arguments used to justify these transformations. Unlike other guides to the philosophy of the

period, this *Cambridge Companion* is not organized by individual philosophers but rather by areas of inquiry. Following an opening chapter that looks broadly at the character and defining tensions of early modern philosophy (Donald Rutherford), the volume proceeds systematically through chapters dedicated to the methodological and conceptual foundations of natural science (Stephen Gaukroger; Dennis Des Chene), metaphysics (Nicholas Jolley), philosophy of mind (Tad Schmaltz), logic and language (Michael Losonsky), ethics (Susan James; Stephen Darwall), political philosophy (A. John Simmons), theology (Thomas M. Lennon), and the enduring vitality of scholastic thought (M. W. F. Stone). A final chapter looks ahead to the end of the early modern period through the lens of the Enlightenment philosophy of Kant (J. B. Schneewind).

THE PHILOSOPHICAL LIFE

Early modern philosophers come in many stripes.⁴ Some were university teachers, some were not. Some were clerics, some were not. As one might expect, almost all were men, but a number of women are now recognized as making notable contributions to the philosophy of the early modern period.⁵ With the exception of Spinoza, all the major figures of seventeenth- and eighteenth-century philosophy were professed Christians, though what exactly such a profession meant was a point of contention, reflecting the continued prominence of religious discord and theological debate in the period.

Although some early modern philosophers chose to pursue careers as university teachers, many were wary of following such a path for fear of the restrictions that might be placed on their freedom to philosophize. Spinoza famously turned down the offer of a professorship in Heidelberg for this reason, choosing to support himself as a lens grinder. In the middle of the eighteenth century, Christian Wolff was forced to flee his position at Halle, because rumors had spread to the king of the dangerous political consequences that could be inferred from his doctrines. For the most part, it was thought that a philosophical life could best be pursued outside the university. In some cases, this was made possible by a private income (Descartes, Shaftesbury); in others it depended upon securing a religious office (Gassendi, Malebranche, Berkeley) or

other employment (Bacon, Hobbes, Leibniz) that left one with sufficient time and freedom to pursue one's own reflections.

For those philosophers who eschewed a university career, philosophy was for the most part a solitary endeavor. From the beginning of the seventeenth century, however, concerted attempts were made to share ideas and intelligence about the latest developments in natural philosophy – a pattern of cooperation that culminated in the establishment of the first scientific societies in Florence, Paris, and London. Prior to this, Marin Mersenne had convened gatherings that brought together many of the leading thinkers in Paris, including at different times Descartes, Gassendi, Hobbes, and Grotius.⁶ Mersenne also carried on an extensive correspondence that connected scholars from across Europe, an activity in which he was followed by Henry Oldenburg, secretary of the Royal Society of London during the 1660s, and by Leibniz. In these ways, philosophers who were not university teachers were nonetheless drawn together in informal intellectual communities.

The world of early modern philosophy was an intimate one. Through his friend Nicolas-Claude Fabri de Peiresc, Gassendi obtained one of Galileo's new telescopes, with which he made a series of important observations. In 1634, while traveling through Italy, Hobbes paid a personal visit to Galileo, then under house arrest near Florence. Through the offices of Mersenne, Descartes's *Meditations* were published in 1641 with objections by Arnauld, Gassendi, and Hobbes. When Leibniz arrived in Paris in 1672, he made the acquaintance of Malebranche and Arnauld. On departing Paris four years later, he spent a week in discussion with Spinoza in Holland. In his early life, he had written to a then elderly Hobbes; he engaged in important correspondences with Arnauld and Wolff; he wrote books responding to works by Bayle and Locke; and near the end of his life he was drawn into a bitter feud with Newton over their rival claims to priority in the discovery of the calculus. Such patterns of contact continued in the eighteenth century with philosophers such as Hume, who composed much of his *Treatise of Human Nature* in France at La Flèche, where Descartes had studied over a century earlier. Hume was a friend of the Scottish philosophers Francis Hutcheson and Adam Smith, and late in life made an abortive attempt to arrange refuge for Jean-Jacques Rousseau in England.

Despite the largely solitary nature of their own activity, then, philosophers in the seventeenth and eighteenth centuries actively studied, disagreed with, and responded to the views of their contemporaries and recent predecessors. This makes the period an especially attractive one in which to study the development of philosophical ideas through the active engagement of thinkers with one another. Such an approach has served as a starting point for much recent research. Moving beyond the question of whether a given philosopher may or may not have read the works of an influential precursor, historians of philosophy have endeavored to disentangle and reconstruct lines of argument that link the views of successive thinkers, illuminating in this way the sources of philosophical creativity and the standards of rationality that guide the progress of philosophy.

LOOKING AHEAD

The seventeenth century is a period of sweeping intellectual change. From the groundbreaking works of Bacon and Galileo to the crowning achievement of Newton's *Principia*, the century ushers in a radically new conception of the natural world and the place of human beings in it. Equally dramatic are the searching reexaminations of the foundations of law, liberty, and political sovereignty carried out by such thinkers as Grotius, Hobbes, and Locke. Philosophy is transformed at every level by these developments. Well-entrenched assumptions about causality, matter, mind, knowledge, language, law, and even God are subject to re-appraisal and in many cases revision. The result is the body of philosophical theories we today think of as the first examples of early modern philosophy, distinguishing them in this way from the inherited synthesis of ancient Greek philosophy and Christianity that had prevailed to that point.

Many of the chapters in this *Companion* begin from a view of early modern philosophy as defined by the efforts of early seventeenth-century thinkers to throw off the "yoke of Aristotle." Often, it was not the philosophy of Aristotle himself whom these thinkers were reacting against, but a version of scholastic Aristotelianism (or "scholasticism") which prevailed in university teaching through the seventeenth century, and in some locations well into

the eighteenth. Fostered by the innovators themselves (e.g. Bacon, Hobbes, Descartes), the dominant narrative of the history of early modern philosophy remains that of a revolutionary movement that aims to illuminate the darkness of a sterile orthodoxy with the sharp light of a new critical reason.

The chapters by Donald Rutherford ("Innovation and orthodoxy in early modern philosophy") and M. W. F. Stone ("Scholastic schools and early modern philosophy") argue in different ways for the need to qualify this narrative. Rutherford shows that, with a few exceptions, the leading innovators of early modern philosophy were committed to maintaining a harmony between the conclusions of philosophical reason and the tenets of Christianity. However radical their challenges to Aristotelian natural philosophy, logic, and epistemology, they sought to preserve the compatibility of their views with Christian orthodoxy, much as their medieval predecessors had done. From the other direction, Stone details how early modern scholastic philosophy is far from the moribund tradition that it is often depicted as being. There is considerable innovation and critical reflection here as well, highlighted by the widely influential works of the Jesuits Luis Molina and Francisco Suárez. Thus, it is an oversimplification to think of early modern philosophy exclusively in terms of the replacing of the old by the new. Other chapters extend this picture of the complexity of the play of the old versus the new in the early modern period. In the apt image offered by Nicholas Jolley in his chapter "Metaphysics," early modern philosophers often can be seen as delivering new wine in old bottles – bottles that later are found to hold with difficulty the potent vintage that has been poured into them.

A further point to keep in mind is that during the early modern period, 'philosophy' does not designate a unitary enterprise. Both diachronically and synchronically, it is a constellation of loosely related investigations of fundamental questions about nature, humanity, and God. We can helpfully distinguish three stages in the evolution of early modern philosophy, corresponding roughly to the three centuries encompassed by the period. Extending a pattern that begins in the Italian Renaissance, the sixteenth century witnesses the reemergence of a host of ancient philosophical views – Platonism, Pyrrhonian skepticism, Epicureanism, Stoicism – along with a variety of attempts to synthesize their insights and to render

them consistent with Christianity. The results are, by ancient lights, eclectic mixtures of ideas, but such mixtures make for a fertile soil from which grow many of the innovations of the next century.

The seventeenth century is best known for landmark advances in the understanding of nature, both those that we take as defining the beginnings of modern natural science and those that we see as characteristically philosophical reflections on the nature of mind and body, and the relation of human beings to God. Here the philosopher who casts the longest shadow is Descartes, whose views stimulate the inquiries of a succession of followers – Malebranche, Arnauld, Pascal, Spinoza, Leibniz – dedicated to extending or correcting his ideas. Yet Descartes is by no means the only seminal philosophical thinker of the seventeenth century. During his lifetime, his greatest rival is Gassendi, whose efforts to defend a Christianized Epicureanism help to make respectable the revival of ancient atomism. Equally significant are the contributions of Hobbes, a friend and ally of Gassendi, who along with Spinoza formulates the most serious challenge in the seventeenth century to received ideas in moral and political philosophy, and Locke, who is instrumental in moving philosophy's center of gravity away from speculative metaphysics.

Where the advances of seventeenth-century philosophy are often tentative attempts to reconceive the broadest outlines of reality, the eighteenth century builds on the secure foundations of Newton's unified theory of the mathematical structure of nature. For eighteenth-century philosophers, consequently, there is comparatively little mystery about the operation of nature. With this issue settled, the weight of philosophical interest shifts from theoretical philosophy to practical philosophy – above all, to the question of the grounds of the moral and political obligations of human beings. Underlying many of the debates of the century is the question that might be seen as the most significant legacy of early modern philosophy: Can human life, and whatever we judge to be of value about it, be defined independently of reference to God, conceived according to biblical teaching as humanity's creator, lawgiver, and judge? The previous centuries had revealed the deep and bloody rifts that could open between men who disagreed about religion. Consequently, the motivation to rise above these

differences and to understand human beings in purely secular terms was strong. How precisely to do this, however, was by no means obvious. Can human beings be understood merely as a part of nature, as Spinoza had suggested already at the end of the seventeenth century? Is there a nontheological yet universal conception of reason in terms of which we can define the common moral identity and value of human beings? These are the questions with which the leading philosophers of the Enlightenment struggled, and to a large extent they remain questions for us today.

NOTES

- 1 For a recent study that conforms to this pattern, see Bennett 2001.
- 2 See the contributions to the Cambridge Philosophical Texts in Context series, beginning with Ariew, Cottingham, and Sorell 1998.
- 3 Renewed emphasis on the practical philosophy of the early modern period has been associated especially with the work of J. B. Schneewind (1998, 2003, 2004). For other contributions, see Tuck 1982, 1993; Darwall 1995; Haakonssen 1996; Krasnoff and Brender 2006.
- 4 Over the past decade a number of excellent biographies and biographical studies of early modern philosophers have appeared in English: Gaukroger 1995; Martinich 1999; Nadler 1999; Kuehn 2001; Malcolm 2002.
- 5 See the new editions of works by Anne Conway (1996) and Margaret Cavendish (2001), as well as the texts collected in Atherton 1994.
- 6 Similar informal intellectual circles, which served as forerunners of later scientific societies, existed in other European countries. See Lux 1991; Feingold 1991.

4 Metaphysics

According to the Gospels, men do not put new wine in old bottles. Metaphorically speaking at least, philosophers of the early modern period tend to be exceptions to this rule. Descartes and his successors inherited a rich metaphysical vocabulary and set of categories from the ancient and medieval world; particularly in the work of Aristotle and his scholastic disciples, this conceptual framework had been devised to articulate a metaphysical picture of the universe very different from any which was likely to commend itself to philosophers in the age of the Scientific Revolution. Nonetheless, instead of rejecting this inherited framework wholesale, philosophers of the period tend to retain it in large measure while infusing it with radically new content. Such content was of course adapted to the task of providing metaphysical foundations for the new scientific world picture. And in the case of many philosophers it was also adapted to the goal of providing new bases for doctrines of traditional natural theology such as the immortality of the soul.

The contrast between the new wine and the old bottles may help to throw light on one difficulty posed by metaphysics of the early modern period. Readers approaching the metaphysical systems for the first time are struck by the fact that philosophers often seem to be announcing “news from nowhere”; the great metaphysical systems tend to be full of strange and extravagant claims, typified by Spinoza’s insistence that there is only one substance, Malebranche’s insistence that there is only one cause, and Leibniz’s insistence that no created substances causally interact with one another. There is no doubt that, fortified by confidence in the power of human reason, philosophers of the period are often led to advance theories of reality that are radically at variance with the dictates of

common sense and which can retain an air of strangeness even after prolonged familiarity. It is of course important to remember that in many cases they draw on a tradition, at least as old as Plato, which emphasizes that there is a fundamental difference between the world of appearances or phenomena and the world of ultimate reality. It is also possible to dispel the air of mystery surrounding such metaphysical claims by seeing that their authors are often seeking to articulate new philosophical insights within a traditional vocabulary and set of concepts. As the Gospels remind us, the danger of putting new wine into old bottles is that it may burst the leather skins. At times, as we shall see, the new insights of early modern philosophers regarding such issues as substance, laws, and causation seem similarly in danger of exploding the traditional metaphysical framework.

Although the leading philosophers of the early modern period are often content to practice metaphysics within a traditional set of categories, it would be misleading to suggest that there were no dissentient voices. John Locke, for example, is famous for his skepticism about whether the concept of substance deriving from Aristotle retains any point or value on the new scientific picture of the world. And even Malebranche, though he claims to be rejecting only natural causality, might be read as advocating that the concept of causality in general should be jettisoned altogether from philosophy. Moreover, some philosophers of the period, of whom Locke is again a prime example, extend their skepticism beyond particular metaphysical concepts to the whole enterprise of metaphysics; that is, they call into question the power of the human mind to understand and articulate the fundamental nature of reality.

METAPHYSICS: ITS METHOD AND PROSPECTS

One of the most famous works of early modern philosophy is entitled *Ethics Demonstrated in the Geometrical Manner*. Even a superficial inspection of this work, which is as much a contribution to metaphysics as to moral theory, reveals the accuracy of its full title. Spinoza's *Ethics* employs throughout the rather intimidating apparatus of Euclid's *Elements*: the reader is immediately confronted with an impressive array of numbered axioms, definitions, postulates, and theorems to be proved. Spinoza's *Ethics* may seem

merely to embody in an extreme and uncompromising form a conviction that was rather widespread among early modern philosophers, particularly in the first half of the period: philosophy should seek to emulate the practice of geometry. It is not difficult to understand why geometry exercised such a hold over the imagination of philosophers in the period. Ever since Descartes in the *Discourse on the Method* had written admiringly of the long chains of reasoning of the geometers (CSM I 120), philosophers had been impressed by the possibility of achieving certain and demonstrative knowledge in geometry; such certainty seemed to contrast favorably with the obscurity, sterility, and inconclusiveness of debates in scholastic philosophy. Moreover, philosophers of the period did not have to look back to the ancients to find impressive contributions to mathematical knowledge. Near the beginning of the period, the discovery of coordinate geometry revolutionized mathematics by synthesizing geometry and algebra; near the end of the period, Leibniz and Newton independently advanced the subject with the discovery of the differential calculus.

The hold that geometry in particular exercised over the imagination of some early modern philosophers is further illustrated by a celebrated anecdote about Hobbes's discovery of the subject:

Being in a Gentleman's library Euclid's Elements lay open, and 'twas the 47 *El. libr. 1* [i.e. the Pythagorean theorem]. He read the Proposition. *By G* -, sayd he . . . *this is impossible!* So he reads the Demonstration of it, which referred him back to such a Proposition, which proposition he read. That referred him back to another, which he also read. *Et sic deinceps* [and so on] that at last he was demonstratively convinced of that trueth. This made him in love with Geometry.¹

Obviously Aubrey's story about the origins of Hobbes's love affair with geometry shows that one reason for the attraction was the prospect of achieving demonstrative certainty. But the anecdote also brings out another aspect of Hobbes's attraction to geometry which is no less revealing: it illustrates the possibility of deriving initially counterintuitive conclusions from previous theorems and ultimately from axioms and definitions which are beyond dispute.² Thus it is not a conclusive objection to a geometrical theorem that it appears counterintuitive or surprising: criticism must focus on the reasoning or the premises from which it is derived. Clearly this

moral of the anecdote is relevant to Hobbes's own political philosophy: Hobbes recognizes that his main conclusion to the effect that nothing less than absolute sovereignty is a properly constituted state will appear shockingly counterintuitive to many of his readers. But it is no less relevant to the metaphysics of the period. The results of metaphysical systems such as those of Spinoza and Leibniz are highly counterintuitive at first sight. Confronted with an objection to this effect, Spinoza and Leibniz could respond in part by observing that our sense of surprise and shock is a function of our bondage to preconceived opinions and the confused ideas of common sense; once we succeed in attaining clear and distinct or adequate ideas, this reaction will disappear. But they could also respond by drawing the same moral from Euclid that Hobbes clearly did: the counterintuitiveness of a conclusion is not a decisive objection to a proposition validly derived from incontestable axioms and definitions.

The Euclidean method may thus seem peculiarly well adapted to the presentation of metaphysical systems that propose serious revisions of commonsense views. But it remains the case that Spinoza's *Ethics* is the only major work of early modern philosophy which adopts the Euclidean model in a pure and thoroughgoing way. Impressed by this fact, some recent writers have tended to question whether even the rationalist philosophers were really committed to the view that metaphysics could achieve the demonstrative certainty of geometry. Indeed, it has even been claimed in the case of Spinoza that the Euclidean apparatus is something of a sham.³ It is certainly true that neither Descartes nor Leibniz made more than intermittent or perfunctory use of the apparatus of Euclidean geometry when writing metaphysics. But it would be a mistake to infer from this that they were not committed to the ideal of geometrical demonstration.

In the case of Descartes, it should be particularly easy to determine his position, for he was pressed on the point by the authors of the Second Objections who invited him to "set out the entire argument [of the *Meditations*] in the geometrical fashion starting from a number of definitions, postulates, and axioms" (CSM II 92). In reply, Descartes claims that there is a sense in which he *has* written the *Meditations* in the geometrical manner. For one thing, the work is written in geometrical order, "which consists simply in this":

The items which are put forward first must be known entirely without the aid of what comes later; and the remaining items must be arranged in such a way that their demonstration depends solely on what has gone before. I do try to follow this order very carefully in my *Meditations*.

(CSM II 110)

It is true, Descartes concedes, that he has not employed the Euclidean apparatus in the *Meditations* (and, we might add, did not do so even in the *Principles*), but here Descartes justifies his practice by means of a distinction between two kinds of geometrical method. The method of Euclid in his *Elements* is the method of synthesis: with its array of definitions, postulates, and axioms it bullies the reader into submission, as it were: "if anyone denies one of the conclusions it can be shown at once that it is contained in what has gone before, and hence the reader, however argumentative or stubborn he may be, is compelled to give his assent" (CSM II 111). But there is also the method of analysis, which shows the true way by means of which the thing in question was discovered. The method of analysis, which is the true method of instruction, is more appropriate to metaphysics than the Euclidean or synthetic method, and it is for this reason that Descartes adopted it in the *Meditations*.⁴

In one way Descartes's explanation of why the synthetic method is not appropriate in metaphysics is somewhat surprising. The explanation turns on an alleged difference between the concepts of geometry and metaphysics: in the former, the concepts at issue are accepted by everyone and accord with the use of our senses; in the latter field, by contrast, they conflict with so many preconceived opinions derived from the senses that it is difficult to make them clear and distinct; indeed, this difficulty is the principal obstacle to doing metaphysics, and can be overcome only by the kind of sustained reflection practiced by the solitary inquirer in the *Meditations*. One might suppose that from a Cartesian perspective the concepts of geometry and metaphysics were epistemically on a par; in each case what is at issue is a body of innate ideas that can be accessed only by turning away from the data of the senses and the imagination. But there is a strand in Descartes's theory of mathematics which tends to emphasize the positive role of the imagination. Even in the Sixth Meditation, Descartes may not wish to deny such a role: he may simply wish to put us on our guard against

supposing that geometrical concepts actually are mental images. Whether or not we think that Descartes's preference for the analytic method is simply ad hoc and self-serving, we should note that he was not insuperably opposed to the method of synthesis in metaphysics; for Descartes at least makes a concession to the authors of the Second Objections by casting part of the argument of the *Meditations* in geometrical (i.e. Euclidean or synthetic) form.

Leibniz, like Descartes, seems to have held that the Euclidean or synthetic method was less than ideal for the presentation of metaphysics. But whereas Descartes stresses facts about the nature of metaphysical concepts as a reason for avoiding this method, Leibniz offers, at least officially, a more straightforward explanation: the mathematical style repels people. It is thus inappropriate for a philosopher who seeks to gain widespread agreement to his principles. Yet such explanations tend to be accompanied by uncompromising statements to the effect that his metaphysics achieves the demonstrative certainty of mathematics. Thus in the same breath Leibniz tells a correspondent: "I never write anything in philosophy that I do not treat by definitions and axioms" (GP III 302). More uncompromisingly, Leibniz earlier informs another correspondent: "I ruled decisively on these general philosophical matters a long time ago, in a way that I believe is demonstrative or not far from it" (GP III 474).⁵

Although the issue is controversial, it is possible that there is a deeper explanation of Leibniz's avoidance of the Euclidean apparatus. None of Leibniz's major expositions of his metaphysics is cast in Euclidean form, but arguably in the *Discourse on Metaphysics* (and some related texts) Leibniz approximates this form more than in later works such as the *New System*, the *Monadology*, and the *Principles of Nature and Grace*. The *Discourse on Metaphysics* is certainly much richer in deductive philosophical arguments than those later writings; moreover, it is not too difficult to see how its arguments could be recast in the form of axioms, definitions, and theorems to be proved. Yet the foundational doctrines in the *Discourse on Metaphysics* included Leibniz's concept-containment theory of truth, and we know that when Leibniz submitted a summary of the work to Arnauld, the latter believed that this theory had wholly unacceptable consequences for human and divine freedom. It is striking that in the later presentations of his metaphysics, the

theory of truth makes no appearance. Thus we cannot discount the possibility that fear of being charged with unorthodoxy lay behind Leibniz's avoidance of the Euclidean method.

Although they may not all embrace the Euclidean method, Descartes, Leibniz, and Spinoza share the same confidence in the possibility of demonstrative metaphysics. In the last decade of the seventeenth century, a major challenge to the claims of dogmatic metaphysics was mounted by John Locke in his great *Essay concerning Human Understanding*. In the introduction to this work, Locke diagnoses the apparent failure of the metaphysicians in terms of their adoption of the wrong method; they had simply assumed without questioning that the human mind was adequate to the task of discovering the ultimate nature and structure of reality:

For I thought that the first Step towards satisfying several Enquiries, the Mind of Man was very apt to run into, was, to take a Survey of our own Understandings, examine our own Powers, and see to what Things they were adapted. Till that was done I suspected we began at the wrong end, and in vain sought for Satisfaction in a quiet and secure possession of Truths, that most concern'd us, whilst we let loose our Thoughts into the vast Ocean of *Being*, as if all that boundless Extent were the natural, and undoubted Possession of our Understandings, wherein there was nothing exempt from its Decisions, or that escaped its Comprehension.

(*Essay*, i.i.7)

In a way that anticipates Kant, Locke thus calls for a reorientation of philosophy toward a critique of the mind's powers.

To say, however, that Locke is skeptical of the possibility of demonstrative metaphysics is not to say that he is skeptical about the possibility of demonstrative knowledge in general. Locke, no less than Descartes or Leibniz, believes that we can achieve such knowledge a priori in the case of mathematics; he is far from subscribing to an extreme empiricism which regards mathematics as an inductive science. Indeed, ironically, Locke is in agreement with Spinoza that "*morality [is] capable of demonstration*" (*Essay*, iv.iii.18). Why, then, is Locke pessimistic about the prospects of demonstrative certainty in metaphysics?

Locke offers a principled answer to this question which strikes deep roots in his theory of knowledge: it turns on the nature of the objects of study in the different disciplines. At the cost of some

oversimplification, Locke's answer is this. In the case of mathematics and morality we are concerned with entities such as triangles and gratitude whose real essences are transparent to the intellect because they are creations of the human mind. In metaphysics, by contrast, as in natural science, we are dealing with entities, such as material substances, whose essences are opaque to us; they are opaque to us because the entities in question are the products of nature, not the human mind. Despite his admiration for the achievements of Boyle and Newton, Locke thus classifies the natural sciences, as we would call them, alongside metaphysics as disciplines in which demonstrative knowledge is for ever beyond our reach (*Essay*, iv.iii.26).

Locke's call for a reorientation of philosophy toward a critique of the human understanding represents one way in which philosophers could react against the enterprise of speculative metaphysics. It is this form of reaction which Hume develops in his *Inquiry concerning Human Understanding*, the title of which is a clear allusion to Locke's great work; indeed, Hume goes much further than Locke in his attempt to expose the illusions of speculative metaphysics (e.g. *Enquiry*, xii.3). But there is another side to Hume's philosophy which turns away from metaphysics and the Euclidean paradigm in a direction which has no real precedent in Locke. Hume's *Treatise of Human Nature*, his early masterpiece, resembles the works of the metaphysicians in the sense that it draws its inspiration from a nonphilosophical model; but the model in question is not Euclidean geometry but the experimental method of the new science: the *Treatise* is, as its subtitle says, an attempt to introduce the experimental method into moral subjects. Hume's professed aim is thus the naturalistic one of seeking to discover laws of human psychology by the same method as Newton and others had discovered laws governing physical phenomena. It is true that in the course of executing his project Hume reveals a deep familiarity with seventeenth-century metaphysical debates about substance, causality, and the like. Officially, at least, however, he is interested not in making a direct and novel contribution to such debates, but rather in explaining why human beings hold the beliefs about the world that they do.

SUBSTANCE

Perhaps nowhere is the tendency of early modern philosophers to pour new wine into old bottles more apparent than in their doctrines of substance. The concept of substance is undoubtedly the most prominent concept in the metaphysical systems of Spinoza and Leibniz: with some qualifications, it plays an important role in Descartes's philosophy, too. The fact that the concept is so prominent in early modern metaphysics reflects the legacy of Aristotle above all, for Aristotle regards metaphysics as that science which is principally concerned with the question: What is substance or being? That is, metaphysics, for Aristotle, is a quest to discover what is ultimately real. But though early modern philosophers are indebted to Aristotle for the term 'substance,' they typically employ it to articulate a very different metaphysical vision of the world from that which is found in Aristotle and his successors. Moreover, even when they retain or echo Aristotelian definitions of 'substance,' they tend to infuse such definitions with new content. As we shall see, in some cases the traditional connotations of the term 'substance' may set up tensions with the metaphysical picture which they wish to articulate.

Of the leading philosophers of the early modern period, at least before Locke, it is perhaps Descartes who is least enthusiastic about the terminology of 'substance'; in some of his more popular writings, such as the *Discourse on the Method*, Descartes comes close to dispensing with the term altogether in favor of the more familiar, everyday word 'thing.'⁶ As we shall see, Descartes's decision to retain the term in the more formal expositions of his system is a source of difficulty for understanding his philosophy. But it would be wrong to dwell on such problems at the outset, for it is the strengths of Descartes's ontology, not its difficulties, that are most immediately apparent and that obviously impressed many of his earliest readers. The attractions of the new Cartesian ontology are not unlike those of the Copernican system in astronomy, in comparison with its rivals: Descartes's ontology is striking by virtue of its simplicity and elegance. In place of the complex Aristotelian picture of a world of substances which are all compounds of matter and form, Descartes substitutes a very different account: the created

universe consists of two kinds of thing or substance, each of which has a principal attribute that constitutes its nature. The nature of body or matter is constituted by the principal attribute of extension, that is, by the property of being spread out in three dimensions. The nature of mind is constituted by the principal attribute of thought or consciousness. The further, more specific properties of body and mind are simply modes, that is, ways of being, of the respective principal attributes: the modes of extension are such properties as being square or triangular; the modes of thought are such properties as willing, doubting, and sensing. It is true that, for all its simplicity and elegance, Descartes's ontology is far removed not only from the Aristotelian–scholastic picture of the world, but also from untutored common sense which that picture was able in part to accommodate; according to Descartes, for example, strictly speaking bodies have no sensible qualities such as color, taste, odor, and sound. But in this respect, too, the parallel with the Copernican revolution in astronomy holds: the Copernican hypothesis that the earth rotates daily on its axis and revolves annually around the sun was similarly less in tune with common sense than the system it replaced. But Descartes, like Copernicus of course, has arguments to persuade the reader that the departure from common sense is not a weakness of his system, for common sense is the repository of preconceived opinions and prejudices.

The attractions of the Cartesian ontology are obvious: its problems appear only when we start to probe beneath the surface. The most famous problem perhaps is that of giving a coherent account of the status of human beings within this system, but there is also a more general difficulty: Descartes seems curiously undecided on the issue whether his dualistic system is symmetrical in respect of the number of substances. There is no question that Descartes subscribes to the thesis that there is a plurality of minds or thinking substances: such a thesis is of course required by Christian orthodoxy, and it is also one datum of common sense which Descartes never appears to challenge. But to the question whether there is similarly a plurality of extended substances, Descartes has often seemed to return an ambiguous answer. Common sense would suggest that there are indeed many extended substances, and Descartes sometimes writes as if particular bodies, such as the lump of wax described in the Second Meditation, do indeed qualify as such substances. But there are pressures in his

philosophy to maintain that the dualism is asymmetrical with respect to this issue: whether this means that there is only one extended substance remains to be seen.

Descartes's difficulties with regard to this issue may spring in part from his decision to cast his system in the traditional terminology of 'substance'; they are arguably compounded by the fact that Descartes offers not one, but two definitions of 'substance' which seem clearly nonequivalent. In the "Arguments in Geometrical Fashion" appended to the Second Replies, Descartes defines 'substance' in a way which, despite the rather convoluted language, is clearly traditional:

Substance. This term applies to every thing in which whatever we perceive immediately resides, as in a subject, or to every thing by means of which whatever we perceive exists. By 'whatever we perceive' is meant any property, quality or attribute of which we have a real idea. The only idea we have of a substance itself, in the strict sense, is that it is the thing in which whatever we perceive . . . exists, either formally or eminently. For we know by the natural light that a real attribute cannot belong to nothing.

(CSM II 114)

Such a definition is a recognizable descendant of Aristotle's conception of substance as an ultimate subject of predication: that is, a substance is a bearer of properties but is not itself a property of something else (in contrast, say, to yellowness or honesty). In terms of such a definition it may seem obvious that particular, finite bodies, such as the lump of wax in the Second Meditation, for example, are extended substances. As Descartes notes, the piece of wax is extended, flexible, and changeable; it thus seems clearly to be a bearer of properties which is not itself predicable of anything else.

In the *Principles of Philosophy*, however, Descartes offers a definition of 'substance' which seems to have different implications for the status of bodies. In this work he defines 'substance' in terms of independence, and though he does not explicitly add the qualification, the independence in question seems to be causal: "By *substance* we can understand nothing other than a thing which exists in such a way as to depend on no other thing for its existence" (*Princ.*, 1.51, CSM I 210). Descartes immediately proceeds to recognize that, taken strictly, this definition rules out all created substances, and a fortiori all extended substances; strictly, only God

satisfies the definition, for all other things exist only with the help of divine concurrence. But Descartes then says that, taken in a weaker sense, the definition does leave room for created substances: “as for corporeal substance and mind (or created thinking substance), those can be understood to fall under this common concept: things that need only the concurrence of God in order to exist” (*Princ.*, I.52, CSM I 210). But if corporeal substance is said to depend only on divine concurrence for its existence, it seems clear that no finite body – whether macroscopic or microscopic – can be a corporeal substance by this definition. The piece of wax, for example, obviously depends for its existence on other finite bodies such as the body of the bee. By contrast, the entire physical universe would seem to satisfy the conditions for substantiality in the weaker sense. Although Descartes does not draw the consequence explicitly in the *Principles*, he seems committed by his definition to denying that there is a plurality of corporeal substances.

It is tempting to conclude that Descartes’s real view is that there is only one extended or corporeal substance – the entire, indefinitely extended physical universe.⁷ Such a thesis has indeed often been attributed to Descartes, but the attribution may rest on a misconception. For it is possible that for Descartes, ‘corporeal substance,’ like ‘matter,’ is in technical jargon a mass noun rather than a count noun.⁸ Just as we cannot meaningfully ask how many golds or waters there are, so we cannot meaningfully ask how many extended or corporeal substances there are: there is just indefinitely extended or corporeal substance. Thus on this reading, the term ‘substance’ is more akin to ‘stuff’ than it is to ‘thing.’ We can still of course say that there are finite, particular bodies, such as the pen on my table, but it is not such countable items which are candidates for extended or corporeal substance: such items would rather be parts of extended or corporeal substance (in the way that water drops are parts of water). That this is Descartes’s view is suggested by a passage from the Synopsis to the *Meditations* where he contrasts body, in the general sense, with the human body in relation to the issue of the incorruptibility of substance:

Secondly, we need to recognize that body, taken in the general sense, is a substance, so that it too never perishes. But the human body, insofar as it differs from other bodies, is simply made up of a certain configuration of

limbs and other accidents of this sort: whereas the human mind is not made up of any accidents in this way, but is a pure substance.

(CSM II 10)

If Descartes does implicitly treat 'extended substance' as a mass noun, we can see again how the new wine of his metaphysics is in danger of bursting the old Aristotelian bottle. For in the Aristotelian tradition, the term 'substance' was surely a count noun: individual substances, for Aristotle, are paradigmatically the sort of things that can be counted.

There are powerful pressures in his philosophy, then, which push Descartes in the direction of recognizing that there is an asymmetry at the heart of his dualism. As we have seen, this asymmetry may take one of two forms: Descartes may hold that the asymmetry is simply with respect to number – whereas there is only one extended substance, there are many thinking substances. More interestingly and more radically, Descartes may hold that the asymmetry is a matter of logical grammar captured in the distinction between count nouns and mass nouns: whereas there is extended substance (or stuff), there are many thinking substances (or things). Whether Descartes consistently recognizes the presence of either asymmetry in his dualism may be disputed, but the idea of some such asymmetry is still highly instructive for an understanding of Descartes's leading rationalist successors: it is tempting to say that Spinoza and Leibniz develop the different sides of the dualism and, with due qualifications, present it as the whole truth about the universe. Whereas Spinoza develops the first side, Leibniz develops the second side.

It is Leibniz who makes one of the most illuminating remarks about Spinoza's philosophical relationship to Descartes: Spinoza, says Leibniz, merely cultivated certain seeds in Descartes's philosophy (GP II 563). Part of what Leibniz has in mind here involves an issue that will come up in the next section: Spinoza goes further than Descartes in his rejection of teleological explanation, that is, explanation in terms of purposes. But the most obvious illustration of Leibniz's point involves the doctrine of substance. In the *Principles of Philosophy*, Descartes, as we have seen, defines 'substance' in terms of causal independence, and infers from this that, strictly speaking, there is only one substance, God. But Descartes immediately takes the point back again, as it were, by allowing that there is

a weaker sense in which there can be created substances. Spinoza, by contrast, will tolerate none of Descartes's qualifications: Spinoza is unequivocal that there is no other substance than God.

There is no doubt that at some level Leibniz must be right that Spinoza's pantheistic metaphysics grows out of a seed that Descartes himself sows in the *Principles*. The difficulty is to know whether Spinoza reaches this doctrine by a strictly Cartesian route. The issue is highly controversial, but it does not seem that Spinoza, like Descartes in the *Principles*, seeks to define 'substance' in terms of causal independence: rather, in the early propositions of the *Ethics*, Spinoza appears to regard causal independence or self-sufficiency as a derivative truth about substance which needs to be established by philosophical argument.⁹ It is true that Spinoza's definition of 'substance' does not wear its meaning on its face, but it seems correct to say that it has Aristotelian roots: by defining 'substance' as "that which is in itself and conceived through itself" (*Ethics*, 1, def. 3), Spinoza seems to mean, in part at least, that substance is a bearer of properties or an ultimate subject of predication. As many writers have noticed, it is possible to express this idea in the terminology of 'independence,' but the independence in question is not causal, but logical: properties are logically dependent on substance, but substance is not dependent on, but prior to, its properties or modes. Spinoza's strategy in the early propositions of the *Ethics* seems to be to show that that which is a genuine bearer of properties or an ultimate subject of predication must also be causally independent or self-sufficient. Thus Spinoza can agree with Descartes about this last point, but not because he subscribes to Descartes's definition of 'substance' in the *Principles*.

If Spinoza finds it necessary to argue for the causal independence of substance, he also finds it necessary to argue further for the thesis that there is no other substance than God; for Spinoza, unlike Descartes, the thesis is not a trivial consequence of the initial definition of 'substance.' Spinoza's strategy has two parts. First, by means of a version of the ontological argument, he seeks to show that God, or absolutely infinite substance, necessarily exists (*Ethics*, 1, prop. 11); for to deny the existence of a God whose essence involves existence is absurd. Further, Spinoza then argues that no other substance can exist. For since God has infinitely many – that is, all possible – attributes, if there were another substance, it would

have to share an attribute with God, and Spinoza has earlier claimed to have established that there cannot be two substances with a shared attribute. The proof of this proposition relies on a principle accepted also by Leibniz: there cannot be two substances with all their properties in common.

Spinoza is thus led to argue for the thesis that there is no other substance than God. But is this a monistic doctrine? Spinoza's metaphysical system has been traditionally described in these terms, and there is clear textual support for the traditional description; in the corollary to *Ethics*, I, prop. 14, Spinoza says: "it follows quite clearly that God is one; that is, in the universe there is only one substance." But our earlier discussion of Descartes may lead us to wonder whether there is not a hint in Spinoza of a different doctrine; in places Spinoza, like Descartes, may implicitly treat 'substance' as a mass noun rather than a count noun. Just as Descartes may be saying not that there is just one extended substance, but rather that there is extended stuff or substance, Spinoza may be saying not that there is one substance, but that there is substance which is both extended and thinking. As in the case of Descartes, Spinoza's metaphysics of substance may be in danger of bursting its Aristotelian bottle.

Although, especially in his later philosophy, Leibniz seems to move far away from Aristotle's metaphysics, he is much more concerned than Descartes or Spinoza to maintain essential continuity with the Aristotelian tradition. Unlike Descartes or Spinoza, for instance, Leibniz never abandons the Aristotelian thesis that the world consists ultimately of individual substances: substances, for Leibniz, as for Aristotle, are items that can in principle be counted. Moreover, Leibniz seeks to accommodate Aristotelian assumptions concerning substances, such as that they are compounds of matter and form. It is one of Leibniz's constant complaints against the Cartesians and their fellow moderns that they had needlessly abandoned the valuable metaphysical insights in the Aristotelian-scholastic tradition. A main aim of Leibniz's philosophy is to show how a metaphysics of essentially Aristotelian inspiration can also provide a proper grounding for the new mechanistic physics.

Leibniz's metaphysics is perhaps most famous for its insistence that an individual substance is a genuine unity or *unum per se*. At times Leibniz may be tempted to define 'substance' in these terms,

but it is important to see that he is not throwing over the traditional definition of 'substance' as an ultimate subject of predication. Leibniz shows his respect for the Aristotelian definition in *Discourse on Metaphysics*, §8, when he remarks that "when several predicates are attributed to a single subject, and this subject is attributed to no other, it is called an individual substance" (AG 40–41). When Arnauld charged Leibniz with simply introducing a stipulative definition of 'substance' as 'that which has true unity,' Leibniz protested that he was being unfair: the conception of substance as a true unity is equivalent to the Aristotelian definition of 'substance' as a bearer of properties or ultimate subject of predication. As Leibniz explains, "To be brief, I hold as axiomatic the identical proposition which varies only in emphasis: that which is not truly *one* entity is not truly one *entity* either. It has always been thought that 'one' and 'entity' are interchangeable" (M 121). On the basis of this conception, Leibniz insists that no mere aggregate can be a substance, and in his middle period he seems attached to the idea that all, and perhaps only, organisms are substances since, unlike inanimate bodies, they are genuine unities by virtue of being informed by a soul or substantial form. Such a thesis drew inspiration from the invention of the microscope and the discoveries that it made possible: it is also true to the teachings of Aristotle in his *Metaphysics*.

Although Leibniz treats the Aristotelian conception of substance with respect, he also insists that it does not go deep enough. In *Discourse on Metaphysics*, §8, Leibniz argues that we can gain more insight into the nature of individual substances by seeing that they have complete concepts which contain everything that can be truly predicated of them; thus it is part of the complete concept of Julius Caesar (located in the mind of God) that he crossed the Rubicon and was assassinated in the Capitol. Although the issue is controversial, it seems that from this thesis Leibniz seeks to derive some of the main doctrines of his metaphysics: individual substances do not causally interact; rather, each is the causal source of all its states which evolve in a harmony with one another that has been preestablished by God.

Leibniz's obsession with the idea that substances are genuine unities finds its most mature expression in the theory of monads. (The term 'monad' derives from the Platonic term for unity.) Perhaps the most important point to make about this difficult and

counterintuitive theory is that it is a form of atomism; as Leibniz says, monads are the true atoms of nature.¹⁰ But monads are of course not physical atoms for Leibniz, for in his view nothing purely material can be a genuine unity: rather, they are spiritual atoms or soul-like entities endowed with perception and appetition. Many of the doctrines which Leibniz had earlier formulated in connection with corporeal substance reappear in a new form in the theory of monads.

Even in the theory of monads, Leibniz seeks to accommodate Aristotelian doctrines; sometimes this accommodation seems rather strained, as in Leibniz's insistence that even monads are in a sense compounds of matter and form. But Leibniz's final metaphysics draws its inspiration far more from the Platonic and neo-Platonic tradition than from the Aristotelian one. The theory of monads, for instance, is a striking illustration of the ancient Platonic thesis that there is a fundamental contrast between the world of appearance and reality. The bodies which we see around us belong to the realm of phenomena: only monads are ultimately real. Nonetheless, there is an important connection between the two realms: bodies are grounded in monads in a quite specific sense. The forces of bodies which are the object of investigation by physicists derive from the primitive forces at the level of monads (L 529–30).

"[Spinoza] would be right if there were no monads" (GP III 575). Despite his professed hostility to Spinoza's "atheism," Leibniz in this famous remark at least pays Spinoza the compliment of regarding his system as the only alternative to his own. Such a judgment is perhaps not surprising, for the two systems represent two very different ways of developing Descartes's legacy. But it would be a mistake to notice only the contrasts between the two systems, which are indeed sufficiently striking. In fact, it is more fruitful to see Leibniz and Spinoza as engaged in a dialogue on the basis of some important shared commitments. Leibniz, like Spinoza, accepts the principle of the Identity of Indiscernibles, but believes that it does not have the consequences Spinoza claims for it. For Spinoza, the principle excludes the possibility of a plurality of substances of the same nature; for Leibniz, it does not have this consequence, for substances can share the same abstract nature while being individuated in terms of their points of view. Leibniz, like Spinoza, accepts that a substance is essentially causally self-sufficient, but whereas Spinoza draws the consequence that there can be no other substance than God, Leibniz,

like Descartes, accepts a somewhat weaker version of this principle which allows for created substances: such substances are as causally self-sufficient as is consistent with their status as creatures.

For all their differences, the philosophers we have discussed agree in according the concept of substance a prominent role in their philosophy, even if they adapt it to accommodate new metaphysical insights. Yet there were other philosophers such as Gassendi and Locke in particular who openly question whether there is a place for the category of substance on the new scientific picture of the world. Locke's contemporaries had, after all, broken entirely with the Aristotelian conception of a world of individual substances ranged into natural kinds according to forms or essences. In place of such a world picture, Locke tentatively accepted the corpuscularian hypothesis according to which the physical world was ultimately made up of tiny corpuscles or particles endowed with the primary qualities of size, shape, solidity, and motion. In the eyes of Locke and others, it was by no means obvious that a concept of substance deriving from Aristotle retained its philosophical value and usefulness. As we shall see here and in the final section, it is not only the Aristotelians who are the targets of Locke's polemics.

Locke's critique of the concept of substance is directed against a line of thinking that can be traced back to a passage in Aristotle's *Metaphysics*. As we have seen, substances, for Aristotle, are ultimate subjects of predication, and such subjects are normally taken to be such items as individual human beings and horses. But in one passage, Aristotle suggests that the ultimate subject of predication is not the individual horse, for example, but rather the ultimate substratum which is opposed to all properties whatever.¹¹ It is this concept of substance as substratum of all properties that is the target of Locke's famous polemic.

From the beginning, Locke's critique of the concept of substance as substratum has intrigued and puzzled his readers. For one thing, Locke's critique is marked by a certain systematic ambivalence: Locke maintains that the idea of a substratum is natural and even indispensable to us, while also deploring its uselessness.¹² Moreover, the critique seems to include two components which are not obviously consistent with one another. On the one hand, Locke complains that the idea of a substratum which is the bearer of properties but itself propertyless is empty of content; for this reason,

it can play no useful role in philosophy. On the other hand, Locke complains that the idea of substance, far from being clear and distinct as the Cartesians suppose, is obscure and confused: it is the idea of something we know not what. In the same vein he complains that substance in general has a nature which is “secret and abstract” (*Essay*, II.xxiii.6). It is natural to object, as Leibniz did, that Locke is here needlessly making difficulties for himself. “If you distinguish two things in a substance – the attributes or predicates and their common subject – it is no wonder that you cannot conceive anything specific in this subject. This is inevitable, because you have already set aside all the attributes through which details could be conceived” (*New Ess.*, II.xxiii). In other words, it is perverse to complain that the idea of such a substratum is obscure and confused, for to do so suggests that there is more to be known. But if the idea of a substratum is the idea of a bare particular opposed to all properties whatever, then there is nothing that could in principle be known. This apparent tension in Locke’s teachings about substance can be resolved, I think, by seeing that he is working with an implicit contrast between the divine and human levels of knowledge. Our idea of substance is indeed empty of content: it is the idea of a propertyless substratum. God has the idea of substance in the sense that he knows what it is to be a genuine thing; it is relative to this perfect divine idea that our own idea of substance is obscure and confused.

The most obvious target of Locke’s polemic may seem to be the Aristotelians, and there is no doubt that they are one of Locke’s targets. But there is also no doubt that Locke, following Gassendi, has the Cartesians in his sights: Locke thinks that he can exploit the poverty of our concept of substance in order to undermine the dogmatic substance dualism of Descartes and his disciples. Thus Locke appeals to the obscurity of our idea of substance in order to argue that, though it may be natural for us to think in dualistic terms, we cannot rule out the possibility that one and the same substratum supports both mental and physical properties. But there is also a hint, perhaps, of a more radical critique. Drawing on the emptiness of the concept of substratum, Locke suggests that the debate between substantial dualists and their opponents has no real content to it, at least at the level of our ideas. Whether we say that one and the same substratum supports mental and physical properties, or that different substrata play this role, is a matter of convention

and custom only: in terms of our imperfect ideas, there is no fact of the matter to be discovered.

Locke's teachings about substance are so rich and ambivalent that they lent themselves to being developed in different philosophical directions. It is traditional to portray Berkeley as one philosopher who developed the negative, critical side of Locke's teachings for his own, very distinctive purposes. In one way this is correct: Berkeley saw how this side of Locke could be exploited in the interests of attacking the doctrine of material substance – that is, that there is a realm of mind-independent physical objects conceived along corpuscularian lines. In a vein that is obviously influenced by Locke, Berkeley insists on the unhelpfulness and indeed incoherence of saying that extension is supported by a substratum. If the claim is taken literally, it leads to an infinite regress of such substrata, for the substratum, being itself extended, will need to be supported by a further substratum, and so on; if it is taken metaphorically, it is unintelligible.¹³

Berkeley's debt to Locke is beyond question, but it would be wholly misleading to portray Berkeley simply as a critic of the concept of substance. Famously, although Berkeley insists that the concept of material substance is incoherent, he also insists that no such difficulties plague the concept of spiritual or mental substance. One of Berkeley's reasons for this asymmetry turns on the notion of support or substratum. In the case of material substance, there is no way of cashing out the metaphor of a support or substratum of properties. In the case of spiritual substance, however, this is far from being so: spiritual substances support their properties – ideas – by perceiving them.¹⁴ Berkeley is thus led to a form of idealism according to which the created universe consists entirely of spiritual substances. Thus, although Berkeley is able to make use of Locke's critique, he is no more led to dispense with the concept of substance altogether than is Leibniz in his own somewhat similar metaphysics. Berkeley is at least prepared to retain some of the old bottles for the new wine of his uncompromisingly idealistic metaphysics.

CAUSALITY

Modern philosophical discussion of the nature of causality has traditionally been traced back to Hume, and it is certainly true that

Hume gave a new direction to philosophical thought about the topic. But it is now realized that Hume himself was building on the work of his predecessors: philosophical theories, such as occasionalism, which were formerly dismissed as extravagant, ad hoc solutions to particular problems are now seen as general theories of great interest which played a pivotal role in the development of thought about causality between Descartes and Hume.¹⁵ On the whole, the philosophers who made the most important contributions to the debate about causality seem to have believed that Descartes's own thinking on this topic remained too conservative. Despite his boast that he was beginning philosophy again on new foundations, in this area of his thought Descartes seemed to accept scholastic assumptions about causality which had no place in his own very different picture of the physical world. For a number of philosophers, the task before them was to complete the Cartesian revolution in this area; they sought to draw out the implications of the new theory of matter and to show that traditional claims about natural causality could no longer be upheld. In some cases, such as the occasionalists, they came close to suggesting that the concept of causality in general should be jettisoned from philosophy.

In the Aristotelian tradition, the term 'cause' (or its Greek and Latin equivalents *aitia* and *causa*) was used in a much broader sense than is current today. In general, a cause was whatever answered a Why? question, and it is in terms of this fact that we must understand why the Aristotelian tradition recognizes four kinds of causes: the efficient, formal, material, and final causes are supposed to correspond to four different kinds of Why? question.¹⁶ Thus to answer the question: Why is the statue so heavy? by citing the fact that it is made of bronze, is to appeal to the material cause. To answer the question: Why is the angle A, inscribed in a semicircle, a right angle? by citing the fact that it is equal to an angle B which is half of a straight angle, is to appeal to the formal cause. In general, with the possible exception of Leibniz, early modern discussions of causality tended to focus on the notion of efficient cause, that is, the kind of cause that brings about a change of state in another thing; it is the efficient cause that is at issue when we say, for example, that the stone caused the window to break. But as we shall see toward the end of this section, there was also a lively debate about the place of final causes, that is, causes that appeal to goals or purposes, in the new mechanistic

picture of the physical world. First, we must turn to the debate over efficient causality.

“Now it is manifest by the natural light that there must be at least as much reality in the efficient and total cause as in the effect of that cause” (CSM II 28). In these terms Descartes states his most explicit principle concerning the nature of efficient causation in the course of proving the existence of God in the Third Meditation. (Although Descartes proceeds to apply this principle to ideas, it is clear that it is intended to be of wholly general application.) Despite Descartes’s claim that it is self-evident, the principle has seemed far from intuitive and vulnerable to counterexamples. Some insight into the principle can be gained by seeing that it is associated with, and indeed follows from, what has been called an heirloom model of efficient causation: in causal transactions, the effect inherits a property, or strictly a property instance, from the cause (CSM II 192). It is perhaps more natural to think of this model of efficient causation in terms of a different metaphor: causation is pictured as a process of contagion. Thus when the lighted gas causes the water in the kettle to become hot, it does so by infecting the water with its own property of heat.

The heirloom or contagion model of causation has often seemed like a relic of the scholastic tradition which remains unassimilated in Descartes’s philosophy. Whether this model of causation was actually embraced by the scholastics has recently been disputed.¹⁷ Nonetheless, it was certainly so regarded by Leibniz, who attacks the doctrine of influx, as he terms it, vigorously throughout his career: for Leibniz, the doctrine is particularly associated with Suárez. According to Leibniz, it is utterly unintelligible to suppose that properties or individual accidents could pass over from one substance to another. “Strictly, it can be said that *no substance exercises on another a metaphysical action or influx . . .* [I]t is impossible to explain how anything passes from one thing into the substance of another.”¹⁸ Leibniz is thus led to the denial of causal interaction between created substances. It is striking that in attacking the doctrine of influx here, Leibniz does not call for a new understanding of efficient causation which would allow us to preserve the intuition that substances causally interact; rather, he seems to hold that influx is the only available model of causal interaction. Yet in his earlier writings, Leibniz had hinted at a different

strategy; he had criticized the scholastic Suárez for badly defining 'cause' in terms of influx (GP IV 148). But if Suárez's definition of 'cause' is a bad one, it seems reasonable to suppose that a better definition might open the way to a defense of causal interaction or transeunt causation.

Leibniz's denial of influx may throw light on a vexed issue concerning the scope of his denial of causal interaction. The doctrine is most famous as a thesis concerning relations between substances, and it is in these terms that it is generally introduced in Leibniz's main expositions of his metaphysics: indeed, some of his arguments depend explicitly on assumptions about the nature of individual substances. The denial of interaction thus applies to monads and perhaps also organisms. But Leibniz can also be found insisting that the doctrine is a thesis in physics which applies to all bodies, whether animate or inanimate: "no impetus is transferred from one body to another, but each body is moved by its innate force which is determined only on the occasion, i.e. in respect of another. For eminent men have already recognized that the cause of the impulse one body receives from another is the body's elasticity itself, by which it recoils from another."¹⁹ Yet if items such as billiard balls are at issue, these are not strictly substances but aggregates of substances for Leibniz. Leibniz seems to be suggesting that causal interaction between such bodies in collision would involve an objectionable form of influx, and is thus impossible.

The heirloom principle, or the doctrine of influx, as Leibniz terms it, thus seems to be a point on which Descartes and Leibniz are sharply divided. There is less disagreement over the status of a weaker, but related principle – the Causal Likeness Principle – to the effect that there must be a likeness between cause and effect. Although Descartes never makes this principle a cornerstone of his philosophy, he is certainly capable of appealing to it implicitly; as we shall see in the next section, he invokes it in connection with the issue of the causation of sensory ideas. However, the form in which Descartes accepted the principle is unclear and has been a subject of debate. In the case of Spinoza, by contrast, there is little ambiguity. His acceptance is prominently proclaimed early on in the *Ethics* (I, prop. 3): "Things which have nothing in common cannot be the cause of one another." For Spinoza, the Causal Likeness Principle serves as the basis for excluding the production of one

substance by another of a different attribute: it thus excludes the creation of matter by God as envisaged by Descartes and indeed many Christian philosophers. As we shall see, the principle also serves as the basis for excluding causation across attributes of the one substance, God or Nature.

Perhaps the principle concerning causality which had the most fruitful results was to be stated by Malebranche in his *Search after Truth*: "A true cause," according to Malebranche, "is one such that the mind perceives a necessary connection between it and its effect" (vi.ii.3). (Although Malebranche does not say so explicitly, it is clear that he understands 'necessary connection' here in a strong logical sense.) In the hands of Malebranche, this principle is a key premise in his most interesting and powerful argument for occasionalism. The principle serves to establish the positive thesis that God is indeed a true cause, for the mind does perceive a necessary connection between the will of an infinite being and its upshots. It is a necessary truth that if God wills a logically possible state of affairs, that state of affairs obtains. The principle also serves to establish the striking negative thesis that is at the heart of occasionalism: no creature is a genuine cause, for the mind does not perceive a necessary connection between any such being and its alleged upshots. It is logically possible, for instance, that one billiard ball should collide with another at rest, and that the stationary ball should fail to move following the collision. It is also logically possible that I should will to raise my arm and that it should fail to move. Particular events in the created world, such as the collision of billiard balls, are thus simply the occasions on which God's genuine causality is exercised; it is in this way that the doctrine gets its name.

The insistence on necessary connection as an essential component of genuine causality was to be taken up and developed in different directions by two of Malebranche's successors. Berkeley employed Malebranche's principle in order to argue for a form of semioccasionalism. Berkeley agrees with Malebranche that the mind does not perceive a necessary connection in the case of bodies, construed, as his immaterialism requires, in terms of collections of ideas: that food nourishes and fire burns is known not a priori, by means of a necessary connection, but by observing regularities.²⁰ But at least in his published writings, Berkeley cannot agree with Malebranche that finite minds or spirits are on a par with bodies.

According to Berkeley, it seems that we do know a priori, by perceiving a necessary connection, that our arm will go up when we decide to raise it. Berkeley's insistence on this asymmetry needs to be understood in terms of his theological commitments. If the human mind in the exercise of its will were not a genuine cause, it could hardly be said to be made in the image of God. Berkeley seems to have believed that, for all their piety, the occasionalists were prepared to sacrifice the teachings of Genesis.

Like Berkeley, Hume agrees with the occasionalists that necessary connection is an essential component of causality; but unlike Berkeley, he agrees with Malebranche's occasionalism in his insistence on the symmetry of the mental and physical cases. In the *Inquiry concerning Human Understanding*, Hume is explicit that we are no more able to perceive a logically necessary connection in the case of voluntary physical movement than in the case of the collision of two billiard balls (*Inquiry*, VII.1). Indeed, within the framework of his own very different, empiricist theory of ideas, Hume adopts and refines the negative Malebranchian arguments. But despite his acknowledged debt to the doctrine, Hume of course is no occasionalist. Hume parts philosophical company with Malebranche by insisting that the necessary connection which is an essential component of our concept of causality must be construed in psychological, not logical, terms. To say that events of type A cause events of type B is to say not only that they are constantly conjoined in our experience; it is to say also that, after sufficient exposure to such regularities, the human mind feels compelled to expect an event of type B on the occasion of an event of type A. As Hume says, upon the whole, necessity exists in the mind, not in objects (*Treatise*, I.iii.14). Insofar as Hume writes as a metaphysician rather than a naturalist, he thus makes his most distinctive contribution to the debate over causality by offering a reductionist or deflationary account of causality which allows us to preserve the intuition that there are causal connections in nature.

The appeal to necessary connection thus not only provided the basis for Malebranche's most powerful and intriguing argument for occasionalism; it also proved a source of inspiration to successors such as Berkeley and Hume. But though the argument from necessary connection is Malebranche's most powerful argument for occasionalism, it is by no means the only one. Malebranche offers two

other important arguments for the doctrine which show him to be engaged in a dialogue with Descartes; in their different ways, both arguments seek to develop the implications of Cartesian theses more fully and consistently than Descartes had done. One such argument for occasionalism is theological: it turns on Descartes's doctrine that God conserves the world by continuously creating it. According to Malebranche, when properly understood this doctrine leaves no room for genuine causal powers on the part of creatures. In recreating bodies, God does not simply will that a billiard ball, for instance, be somewhere or other; his volitions are fully specific or determinate with regard to such variables as location and velocity (*Dial.*, VII.II). Thus there is no need for God to endow created substances, whether minds or bodies, with genuine causal powers of their own; and since God always acts in the simplest way, we can be sure that he has not done so. Although most naturally illustrated with reference to bodies, this argument is of wholly general application; it applies to created minds as well as bodies. Another argument is more modest in scope inasmuch as it has no implications for the status of minds: it turns on the new Cartesian conception of matter. Malebranche rightly observes that on the Cartesian account, matter, being defined in geometrical terms, is purely passive and devoid of active force; it is subject, for instance, to the law of inertia. So understood, matter is incapable of being a genuine cause (*Dial.*, VII.5; cf. OC x 47). It is in this argument, perhaps, that the connection between metaphysics and the new physics is tightest.

Final causes

Whether Descartes was entitled to say that bodies are genuine efficient causes may be disputed, but there is no doubt that he sought to banish all causes but efficient causes from the new physics. In particular, Descartes sought to argue that appeals to final causes have no place on the new mechanical conception of the physical world. Descartes, in other words, seeks to banish from physics any explanations which appeal to divine or cosmic purposes: for example, it is wholly inappropriate to say that the rain fell in order that the crops might grow.²¹ In the *Meditations*, Descartes justifies the exclusion of final causes from physics on theological grounds:

Since I now know that my own nature is very weak and limited, whereas the nature of God is immense, incomprehensible and infinite, I also know without more ado that he is capable of countless things whose causes are beyond my knowledge. And for this reason alone I consider the customary search for final causes to be totally useless in physics; there is considerable rashness in thinking myself capable of investigating the impenetrable purposes of God.

(CSM II 39)

It is tempting to say that Descartes is somewhat disingenuous here. His real reasons for banishing final causes from physics turn on the sufficiency of mechanical explanations of phenomena and on the fact that, unlike teleological explanations, they appeal only to clear and distinct ideas. But Descartes is not above seeking to legitimate his revolutionary redirection of physics by appealing to considerations of piety.

We saw in an earlier section that according to Leibniz, Spinoza merely cultivated certain seeds in Descartes's philosophy. With the possible exception of his teachings concerning substance, none of Spinoza's doctrines illustrates the truth of Leibniz's dictum better than his stance on final causes. It is important to notice that Descartes does not go so far as to deny that God has purposes; he simply says that they are impenetrable, and that it is for this reason that they should not be invoked in physics. Spinoza, by contrast, converts Descartes's negative epistemological claim into an ontological one: God has no purposes (*Ethics*, I, appendix). Such a thesis is consistent with his conception of God as an impersonal being devoid of will and intellect; indeed, it follows from that doctrine in conjunction with the further assumption that only persons can have purposes. Spinoza's strong thesis, of course, like Descartes's weaker one, has implications for physics, for if God (or Nature) has no purposes at all, then it trivially follows that it is misguided to seek to explain physical phenomena in terms of divine or natural purposes. Some readers have supposed that Spinoza takes the even stronger position that teleological explanation is misguided in principle.²²

A self-consciously rearguard action in defense of final causes was mounted by Leibniz, who characteristically holds that teleological explanation is not in competition with explanation in terms of efficient causes. Leibniz insists, like Malebranche, that God acts from final causes, for God is a benevolent person whose goal in

creation is to maximize the good. In opposition to Descartes, Leibniz further insists that there is a place for teleological explanation even on the new anti-Aristotelian physics. Leibniz's underlying idea here seems to be that in the conduct of scientific research, it is often helpful to adopt the divine perspective at least as a heuristic device; that is, scientific discovery will be aided by reflection on the fact that God aims always to produce his effects "by the easiest and most determinate ways" (*Discourse*, §21, AG 54). Leibniz is fond of citing Snell as a prominent modern example of a scientist who followed the method of final causes, for Snell sought the easiest or most determinate path by which rays of light might pass from a given point in a medium to a given point in another (*Discourse*, §22, AG 55). Leibniz's rehabilitation of final causes is typically ingenious, but it may be doubted how far his own conception of teleological explanation agrees with the Aristotelian one.²³

SUBSTANCE, CAUSALITY, AND THE MIND–BODY PROBLEM

The tendency of early modern philosophers to put new wine into old bottles is strikingly illustrated by Descartes's attempt to explain the unity of a human being in terms of his dualistic metaphysics. One of the strengths of the old Aristotelian–scholastic tradition was its ability to give a convincing account of such unity; the soul was regarded as a substantial form which unifies and organizes the matter of the human body. Descartes, of course, broke with this tradition with his revolutionary insistence that the mind is a purely thinking substance which is really distinct from its body; the body, if not a substance in its own right, is at least part of a substance which is wholly different in nature from mind. On Descartes's account, then, a human being seems to be a mysterious compound of two utterly heterogeneous entities. Yet Descartes insists in the *Meditations* that in fact on his metaphysics the mind and its body form a very tight union (CSM II 56). In correspondence with his wayward disciple Regius, Descartes even goes so far as to instruct him to say that the human being is a "true *ens per se*, and not an *ens per accidens*" (CSM III 206). Indeed, Descartes has seemed to some readers to be suggesting that the mind–body union is a genuine third substance which is the true subject of properties, such as sensation and imagination, which cannot be properly attributed to

either the mind or the body alone.²⁴ At the very least Descartes claims to believe that his new dualistic metaphysics can do justice to the old Aristotelian–scholastic doctrine that a human being is an *ens per se*, or genuine unity. In general, Descartes’s successors did not share his confidence that he had solved the problem of unity or the related problem of mind–body interaction.

Of Descartes’s major successors, it is Leibniz who is most sympathetic to the Aristotelian–scholastic approach to the problem of unity. As we have seen, Leibniz is attracted by the thesis, deriving from Aristotle, that the paradigm substances are organisms, and in terms of this thesis Leibniz is capable of articulating a standard Aristotelian–scholastic theory of the status of the soul. In some notes responding to Fardella, Leibniz writes in a purely Aristotelian–scholastic vein that “the soul, properly and accurately speaking, is not a substance but a substantial form, or the primitive form existing in substances, the first act, the first active faculty” (AG 105). Yet it is uncharacteristic of Leibniz to take such a purely scholastic position. More typically, even during the period in which he recognizes the existence of corporeal substances, Leibniz modifies Aristotelian–scholastic teachings in order to accommodate Platonic and Cartesian intuitions. A living organism such as Alexander the Great is indeed a substance, and his soul plays the unifying role which it plays for Aristotle and his scholastic disciples, but Leibniz also wants to insist that the soul is a substance in its own right. Moreover, toward the end of his career, Leibniz moves even further away from Aristotelian–scholastic teaching. According to the doctrine of monads, not only is the human soul (or mind) a substance in its own right, but the human body is itself an aggregate of such substances (i.e. monads) whose states evolve in a preestablished harmony with those of the soul. It is true that Leibniz still wishes to say that it is the presence of the soul that confers unity on the human being, but he is now driven to explain such unity by saying that the soul is the dominant monad with respect to the aggregate of subordinate monads which constitute the human body. The claim that the human soul is the dominant monad is unpacked in terms of relations of clarity and distinctness among perceptual states.

Spinoza was no less dissatisfied than Leibniz by Descartes’s account of the unity of a human being; indeed, he is even more unsparing in his ridicule of Descartes’s position. But, as we should expect,

his own proposed solution to the problem owes little or nothing to the Aristotelian–scholastic tradition. In outline, Spinoza’s solution to the problem is remarkably simple: mind and body are one and the same thing. This thing is not of course a substance, but a finite mode of the one substance, God or Nature. Stated thus baldly, Spinoza’s thesis that mind and body are identical may seem indistinguishable from the outright materialism of Hobbes, but it would be misleading to assimilate their positions too closely. It is true that Hobbes and Spinoza are alike in rejecting the view that the human mind is an immaterial substance; they are thereby able to circumvent all the problems that Descartes had found in explaining how such a substance is united to its body. But the difference between Hobbes and Spinoza is suggested by the way in which the former qualifies his bald statement of identity: mind and body are one and the same thing, conceived now under the attribute of thought, now under the attribute of extension (*Ethics*, III, prop. 2 schol.). Spinoza regards the mental and the physical as irreducibly different – indeed, really distinct – aspects under which a human being may be conceived; the attributes of thought and extension run through the whole of nature, and neither attribute has primacy over the other. Hobbes, by contrast, is a reductive materialist: the mental is simply a subdomain of the physical, and it is the physical which is ontologically basic.

A third solution to the problem of the unity of a human being may have its roots in Descartes’s own teachings. Descartes has sometimes been read as saying that the unity of a human being is constituted simply by the fact of interaction between body and mind. In the *Dialogues on Metaphysics* and elsewhere, Malebranche develops this thesis in an occasionalist direction. As an occasionalist, Malebranche cannot hold that there is any genuine causal interaction between mind and body, but he can and does say that mental and physical events are occasional causes. Moreover, Malebranche also expresses this idea in terms of the existence of “laws of the union of mind and body,” or as we might say, psychophysical laws:

Thus it is clear that in the union of the soul and the body there is no other connection than the efficacy of the divine decrees: decrees which are immutable, and efficacy which is never deprived of its effect. God has therefore willed, and he wills unceasingly, that the various disturbances of the brain

are always followed by various thoughts of the mind united to it. And it is the constant and efficacious will of the Creator which, properly speaking, effects the union of these two substances. For there is no other nature, that is, there are no other natural laws except the efficacious volitions of the Almighty.

(*Dial.*, IV.11)

Malebranche thus invokes the idea of divinely decreed laws to offer a deflationary account of the union of mind and body.

The problem of interaction

Whether or not Descartes tries to cash out the union of mind and body in terms of interaction may be disputed, but it was widely agreed by Descartes's successors that he faced an insuperable problem in explaining how such interaction is possible on his ontological principles. In the *New System*, for example, Leibniz writes that "how the body makes anything happen in the soul, or vice versa . . . Descartes had given up the game at this point, as far as we can determine from his writings" (AG 142–43; cf. Spinoza, *Ethics*, v, pref.). Indeed, it is sometimes thought that the great metaphysical systems such as Malebranche's occasionalism and Leibniz's doctrine of preestablished harmony were devised as ad hoc solutions to this one problem. But it should be clear by now that this view is misleading. As we have seen, such systems address more basic and general problems about whether there is a place for natural causality on the new mechanistic scientific world picture, and if so, how it can be accommodated. The challenge which Malebranche, Spinoza, and Leibniz faced was to devise principled solutions to the problem of interaction on the basis of their general commitments concerning the nature of substances and of efficient causality.

Descartes's successors may have found problems in his apparent commitment to the interaction of mind and body, but was Descartes himself aware of a problem? Here, as elsewhere, Descartes seems to speak with an ambiguous voice. Sometimes, as in correspondence with Arnauld, Descartes writes in such a way as to suggest not only that mind and body do interact, but that such interaction is unproblematic: "That the mind, which is incorporeal, can set the body in motion is something which is shown to us not by

any reasoning or comparison with other matters, but by the surest and plainest everyday experience" (CSM III 358; cf. CSM II 275). There has been a tendency among commentators to suppose that Descartes is not entitled to such confidence. But in fact it is by no means obvious that mind–body interaction is inconsistent with Descartes's own official pronouncements concerning causality.²⁵ As we have seen, his most explicit principle concerning causality maintains that there must be at least as much reality in the total efficient cause as in the effect. Descartes is not without resources for reconciling this principle with two-way interaction of mind and body. On Descartes's scale of reality, substances rank higher than modes. If, then, in the interaction of mind and body, substances are causes of the modes in another substance, there will be no violation of this admittedly rather obscure principle regarding efficient causality.

At other times, however, Descartes seems more willing to concede that the interaction of mind and body is problematic on his principles. To Princess Elisabeth, for instance, he writes that the question of how the soul can move the body is "the one that can be most properly put to me in view of my published writings" (CSM III 217). On occasion, indeed, Descartes seems prepared to abandon in part his commitment to such interaction on the grounds that it would conflict with accepted causal principles. In the *Comments on a Certain Broadsheet*, for instance, Descartes argues against the existence of strictly adventitious ideas (that is, ideas that are caused by external physical objects) by appealing to the fact that there is no likeness between sensory ideas and corporeal motions; there is, for instance, strictly no color in the external physical world (CSM I 304). Here, then, Descartes is prepared to appeal implicitly to a Causal Likeness Principle in order to rule out at least the action of body on mind.

It is this side of Descartes that is developed by his leading successors who advanced positive metaphysical systems of their own. Malebranche, Spinoza, and Leibniz all deny that there is, strictly speaking, any causal interaction between mind and body.²⁶ Such an approach to the problem of mind–body interaction may seem initially surprising, but further reflection suggests that it should not be. In the first place, such philosophers seek to derive their denial of mind–body interaction from their general commitments concerning

efficient causality. Moreover, in the case of Spinoza and Leibniz, a further motivation for their approach to the problem of interaction was their desire to uphold the principle of the causal closure of the physical world; that is, every physical event has exclusively physical causes. Clearly, this principle cannot be consistently combined with both the recognition of interaction and the dualistic thesis that the mental and the physical are different in nature. Since, in contrast to Hobbes, their commitment to this last thesis is nonnegotiable, they avoid an inconsistent triad of propositions by denying mind–body interaction. In the eyes of Leibniz, in particular, acceptance of the principle of causal closure is essential to any satisfactory physics. Indeed, Leibniz complains that even Malebranche’s occasionalist adjustment of Descartes’s ontology threatens to introduce a troublesome “disturbance” of the laws of physics (*Theod.*, §61). Leibniz’s worry here is that to hold, as Malebranche does, that mental events may be even occasional causes of physical events is inconsistent with the principle of the conservation of momentum.

Of the three solutions to the problem of interaction proposed by Malebranche, Leibniz, and Spinoza, it is perhaps Spinoza’s position that is most puzzling. The source of the problem lies in Spinoza’s insistence that mind and body are one and the same thing conceived under different attributes – the attributes of thought and extension. The attempt to combine this thesis with the further thesis that the mental and physical realms are alike causally closed, appears to lead to paradox. For it seems intuitive that if A is the cause of B, and B is identical with C, then A is the cause of C. Thus, for example, if the stinging action of the bee causes a state of the brain and this state of the brain is identical with pain, then the bee’s sting causes pain. But Spinoza cannot accept this causal principle, for in conjunction with his identity thesis it entails a conclusion which is inconsistent with his denial that there is any causal flow between the mental and physical realms.²⁷ The solution to this paradox seems to lie in a proper understanding of Spinoza’s conception of cause, which is alien to the post-Humean mind. For Spinoza, the link between cause and effect is one that is perspicuous to the intellect; to say that A is the cause of B is to say at least that A explains B in an illuminating way. When causation is understood in these terms, the general principle that Spinoza’s philosophy seems to violate no

longer appears intuitive. In technical jargon, for Spinoza, causal contexts are not referentially transparent but opaque.²⁸

In common with Descartes's other major successors, Locke addresses not only the issue of the ontological status of the mind, but the further question of whether it interacts with the body; like them, he sees these issues as related in interesting ways. But in other respects, here as elsewhere, Locke stands apart, for in his case the direction of the argument is quite different. The philosophers we have examined so far tend to argue from the heterogeneity of mind and body to the impossibility of causal interaction between them. Locke, by contrast, like Descartes himself on occasion, accepts the interaction of mind and body as a fact of experience which cannot be sensibly denied, and exploits this fact as a basis for undermining an immaterialist theory of mind. Locke can agree with others that it is difficult to conceive of interaction between heterogeneous substances, but for him this serves as a reason for doubting that mind and body are such substances. "What certainty of Knowledge can anyone have that some perceptions, as v.g. pleasure and pain, should not be in some bodies themselves, after a certain manner modified and moved, as well as that they should be in an immaterial substance, upon the Motion of the parts of Body: Body as far as we can conceive being able only to strike and affect body, and Motion, according to the utmost reach of our *Ideas*, being able to produce nothing but Motion" (*Essay*, iv.iii.6). It is true that Locke never entertains the possibility of reductive materialism; that is, he never entertains the hypothesis that mental states are simply identical with brain states. But while he is committed to property dualism, he does exploit the fact of mind-body interaction in order to question the truth of substantial dualism. Here, as so often in his philosophy, Locke appeals to the deliverances of common sense in the service of a rather subtle and systematic attack on Cartesian dogmatism about the essences of mind and matter.

SPACE AND TIME

For obvious reasons, philosophers up to the time of Kant tended to debate the nature of space and time in tandem. Yet it is also noticeable that they tended to focus more sharply on the case of space; philosophical theories that seem primarily tailored to space are

often said to apply *mutatis mutandis* to the case of time. This tendency to focus on space at the expense of time is particularly prominent in the early modern period. Accordingly, in this section we shall devote more attention to space than to time.

Philosophical debate about space centered on a cluster of issues which were not always sharply distinguished. One such issue concerns the place of space within the system of ontological categories favored by early modern philosophers: is space a substance, an attribute, or a relation? As we shall see, each of these options could boast distinguished advocates. A related issue concerned the actuality and even the possibility of empty space or the void. Philosophers who were united in their rejection of scholastic physics and their adherence to the new mechanical philosophy could be sharply divided over whether the physical universe was a plenum. Although they would have deplored its anthropomorphic phrasing, some philosophers continued to agree with Aristotle's dictum that nature abhors a vacuum, while others sought to revive the Epicurean theory of atoms in a void. A final issue concerning the infinity or finitude of space was particularly sensitive for theological reasons, for traditionally only God was supposed to be strictly infinite. Thus philosophers who cared about theological orthodoxy had to tread carefully around this issue.

The first two issues concerning space are tightly related in the case of Descartes and Spinoza. In his *Principles of Philosophy*, Descartes explains that there is only a rational distinction between space and corporeal substance:

There is no real distinction between space, or internal place, and the corporeal substance contained in it: the only difference lies in the way in which we are accustomed to conceive of them. For in reality the extension in length, breadth and depth which constitutes a space is exactly the same as that which constitutes a body.

(*Princ.*, II.10, CSM I 227)

Descartes thus answers the purely ontological question by saying that space is in effect a substance which differs from matter only in our way of conceiving it. And from the ontological thesis, Descartes proceeds to derive an answer to the related question about the vacuum: since space and corporeal substance are one and the same under two descriptions (merely rationally distinct), a vacuum or empty space is strictly impossible.

The impossibility of a vacuum, in the philosophical sense of that in which there is no substance whatsoever, is clear from the fact that there is no difference between the extension of a space, or internal place, and the extension of a body.

(*Princ.*, II.16, CSM I 229–30)

Although Descartes's commitment to the impossibility of a vacuum is uncompromising, a complicating factor is introduced by his extreme doctrine of divine omnipotence. In correspondence with Arnauld, Descartes explains that he would not dare to say that God could not bring about the existence of wholly empty space (CSM III 358–59). But at the same time he makes it crystal clear that a vacuum involves a "contradiction in my conception." For Descartes, it is no less impossible that there should be a vacuum than that two plus one should not be equal to three.

Spinoza's thinking about space involves a characteristic attempt to accommodate Cartesian themes within a pantheistic metaphysics. Like Descartes, Spinoza holds that space is only conceptually distinct from extended or corporeal substance; like Descartes, too, for this reason he is committed to the impossibility of a vacuum (with no Cartesian qualifications stemming from reflection on divine omnipotence). But Spinoza's abandonment of the transcendent God of orthodox theology allows and even in some cases dictates a departure from Cartesian principles. For reasons of theological caution, Descartes had been reluctant to deify space, as it were, by proclaiming it to be infinite; instead, Descartes had preferred to say that it was boundless or indefinite (*Princ.*, I.27, CSM I 202). Spinoza, of course, has no such scruples about saying that space as extended substance is infinite; indeed, a major inspiration of his whole pantheistic metaphysics was the insight that space, on the new science, was taking on an attribute which had traditionally been ascribed to God alone. Spinoza's readiness to deify extended substance lies behind a further departure from the Cartesian framework: Spinoza holds that this substance is indivisible. The philosophical point behind this attempt to accommodate a traditional property of God within his system seems to be that space is logically prior to its regions: such regions can only be identified as regions of space. Thus space is not built up of regions in the way that a whole is built up of parts.²⁹

The same tendency to take up a dogmatic stand on the ontological status of space is visible in the work of Newton's prominent

philosophical spokesman, Samuel Clarke. Newton himself tended to be averse to philosophical speculation, which he believed had corrupted Christian theology, but Clarke had no such scruples; in correspondence with Leibniz and elsewhere, Clarke was prepared to explore the metaphysical and even theological underpinnings, as he saw them, of the Newtonian theory of absolute space and time. According to this theory, which is motivated by complex scientific arguments, absolute space and time are like giant, indeed infinite, containers for bodies and events respectively: space is logically prior to bodies, and time is logically prior to events or processes.³⁰ To say that absolute space and time are containers might suggest that in ontological terms they are substances, but this is not in fact Clarke's view. According to Clarke, space and time are not substances but attributes; indeed, they are attributes of God himself.³¹ Infinite space is the divine attribute of immensity; infinite time is the divine attribute of eternity. Clarke's insistence that space and time are attributes may seem philosophically unmotivated, but it no doubt reflects his religious concerns. Clarke, like Spinoza, wishes to exploit the theological associations of infinity, but unlike Spinoza, he does not wish to stray far from Christian theological orthodoxy. Clearly Clarke could not have identified absolute space and time with the very substance of God without falling into heresy.

The Newtonian theory of absolute space and time has some implications for the other main issue debated by philosophers in the period. As we have seen, for Newton, space does not depend logically on matter for its existence; for this reason empty space is at least a logical possibility. But the Newtonian theory of empty space does not of itself imply that there actually is such empty space; as far as the theory is concerned, it is conceivable that absolute infinite space is everywhere full of matter. But Newton and his disciple in fact agree with the Epicurean tradition in recognizing the existence of atoms and the void.

In their different ways, Descartes, Spinoza, and Clarke all accord a fundamental place to space in their ontologies; Spinoza and Clarke even agree in linking space with God. It is obvious that Leibniz, especially in his mature metaphysics, is not in a position to do the same, for according to the doctrine of monads the only true substances are immaterial souls whose basic properties or attributes are perception and appetition. Indeed, Leibniz cannot find any place

for either space or time at the ground floor of his metaphysics. Here it is helpful to recall that, more clearly than Descartes or Spinoza, Leibniz operates with a sharp distinction between appearance and reality. Space and time, for Leibniz, are purely phenomenal; they belong to the realm of appearances, and not the realm of what is truly real, namely monads.

To say that space and time are appearances, however, does not settle the question of their ontological status. In the correspondence with Clarke, Leibniz provides a clear answer to this question which contrasts sharply with the Newtonian and Cartesian views: space and time, for Leibniz, are neither substances nor attributes, but relations. "I hold space to be something merely relative as time is . . . I hold it to be an order of coexistences, as time is an order of successions" (*Third Letter*, §4, AG 324). Thus for Leibniz, space and time depend logically on the existence of bodies and events respectively. If there were no bodies there would be no space; if there were no events there would be no time.

In correspondence with Clarke, Leibniz defends a further ontological thesis: space and time are not merely relational but ideal. The thesis that space and time are ideal follows from the relational theory in conjunction with Leibniz's doctrine that only substances are fully real, everything else, including relations, being an *ens rationis* or mental construct. The reference to mental constructs serves to show that the ideality of space and time is to be sharply distinguished from the idealism of the theory of monads. To say that space and time are ideal is to say that, as relations, they are contributed by the perceiving mind; to say that the theory of monads is a form of idealism is to say that the basic substances are mental or quasi-mental in nature. Moreover, the claim that space and time are ideal has no tendency to imply that reality is constituted by such quasi-mental substances. Even if, as in his middle period, Leibniz accepted the existence of corporeal substances, he would still be committed to the ideality of space.

Philosophers such as Leibniz and Clarke were divided, then, on the merits of the relational and nonrelational theories of space. Although he was writing before the famous correspondence, in his *Essay* Locke reveals his awareness not only of the issues in this debate but also of its theological dimensions. Characteristically, Locke refuses to arbitrate between these two main positions: "But

whether any one will take Space to be only a relation resulting from the Existence of other Beings at a distance; or whether they will think the Words of the most knowing King *Solomon*, *The Heaven and the Heaven of Heavens, cannot contain Thee*; or those more emphatical ones of the inspired Philosopher *St. Paul*, *In Him we live, move, and have our Being*, are to be understood in a literal sence I leave everyone to consider" (*Essay*, II.xiii.26). Although Locke himself prefers to remain agnostic, some readers have supposed that there was a development in his thought on the issue; under the influence of Newton he may have moved away from the relational theory to the doctrine of absolute space and time.³²

Locke may have come to favor the absolute theory, but there is no reason to suppose that he felt himself thereby committed to either a substantive or attributive theory. Locke's tendency to question the value of traditional ontological categories is evident in his discussion of the one issue concerning space and time on which he was concerned to defend a positive stance, namely the theoretical possibility of a vacuum. Locke's defense of this position is of course integral to his whole polemic against Cartesian dogmatism which, on this issue, recognizes only a rational distinction between matter and space and concludes that a vacuum is absolutely impossible. Locke attacks the Cartesian dogma in various ways: he appeals to conceptual considerations about the evident distinctness of our ideas of body and space, and he rehearses some traditional arguments, which go back to the Epicureans, to establish the theoretical possibility of empty space (*Essay*, II.xiii.21). But his most distinctive method of attack on the Cartesian dogma emerges in response to one familiar ontological objection: "If it be demanded (as usually it is) whether this *Space* void of matter, be *Substance* or *Accident* I shall readily answer, I know not, nor shall be ashamed to own my Ignorance, till they that ask, shew me a clear distinct *Idea* of substance" (*Essay*, II.xiii.17). Thus Locke seeks to remove the sting of the standard objections to the possibility of a vacuum (space void of matter) by questioning the value of the categories of traditional orthodoxy.

Locke is skeptical not only about the value of traditional ontological categories such as that of substance; he is skeptical also about the whole enterprise of demonstrative metaphysics. Here, as in other areas of his philosophy, Locke anticipates and no doubt

helps to shape the spirit of the succeeding age. The eighteenth century was to witness a reaction against the construction of metaphysical systems such as those of Descartes, Leibniz, and Spinoza. No doubt the multiplication of very different systems, all making the same claims to demonstrative certainty, helped to bring the enterprise into discredit. Moreover, the divergence of the metaphysicians contrasted unfavorably with the success of the experimental scientists; the scientists may have had their disagreements about the theoretical foundations of their work, but they were able nonetheless to boast solid achievements. In any case, Locke's insistence that philosophers should begin by taking a survey of their understandings was not to go unheeded in the following century; it was to be the guiding spirit of the Critical philosophy of Kant.³³

NOTES

- 1 Aubrey 1972, p. 230.
- 2 The point is well made by Watkins 1973, p. 13.
- 3 See Bennett 1984, pp. 16–20. Bennett argues that Spinoza's method is hypothetico-deductive rather than demonstrative (pp. 20–23).
- 4 For further discussion of Descartes's distinction between the analytic and the synthetic method, see Curley 1986.
- 5 For Leibniz's views on metaphysics as a demonstrative science, see Rutherford 1995a, pp. 73–79.
- 6 Cf. Cottingham 1993, p. 159.
- 7 See, for instance, Williams 1978, p. 253.
- 8 Cf. Woolhouse 1993, pp. 45–50.
- 9 The view that Spinoza defines 'substance' in terms of causal independence is defended by Curley 1969. For criticisms of Curley's thesis, see Bennett 1984, pp. 92–96.
- 10 *Monadology*, §3 (AG 213).
- 11 *Metaphysics*, 1028b. This Aristotelian anticipation of Locke's account is noted by Woolhouse 1993, p. 7.
- 12 Locke's ambivalence toward the idea of substance in general has been noted by many commentators; see, for example, Bennett 1987. In recent years Locke's teachings concerning substance have been the subject of great controversy. For a very different account of Locke's position than the one defended here, see Ayers 1991, vol. II, pp. 15–128.
- 13 *Three Dialogues*, I, in Berkeley 1948–57, vol. II, pp. 197–99.
- 14 *Three Dialogues*, III, in Berkeley 1948–57, vol. II, pp. 233–34.

- 15 Commentators who have contributed to this reassessment of causality in the period include Loeb 1981, McCracken 1983, Clatterbaugh 1999, and Nadler 2000b.
- 16 For a helpful account of Aristotle's doctrine of the four causes in relation to early modern philosophy, see Mates 1986, pp. 158–60.
- 17 See O'Neill 1993.
- 18 *Primary Truths*, in Leibniz 1973, p. 90.
- 19 *A Specimen of Discoveries*, in Leibniz 1973, p. 79 (translation modified).
- 20 *A Treatise concerning the Principles of Human Knowledge*, §31, in Berkeley 1948–57, vol. II, p. 54.
- 21 This example comes from Bennett 1984, p. 213.
- 22 See Bennett 1983. For an opposing view, see Curley 1990 and Garrett 1999.
- 23 The differences between Aristotle's and Leibniz's conceptions of teleology are noted in Garrett 1999.
- 24 The thesis that the mind–body union forms a third substance is defended in Hoffman 1986. Cf. Cottingham 1986.
- 25 See Loeb 1981, ch. 3; Richardson 1982; Radner 1985.
- 26 For further discussion of their positions, see Schmaltz's chapter in this volume.
- 27 The issue is discussed in Delahunty 1985, p. 97.
- 28 See Della Rocca 1996, ch. 8.
- 29 Cf. Bennett 1984, p. 86.
- 30 For an illuminating discussion of the issues, see Broad 1981.
- 31 *A Demonstration of the Being and Attributes of God* (1705), props. v–vi, in Clarke 1738, vol. II, pp. 539–41.
- 32 See Lennon 1993, secs. 18, 276–88.
- 33 I am very grateful to Donald Rutherford and Sean Greenberg for their helpful comments on earlier drafts.